



**Broadband Infrastructure Application  
Submission to RUS (BIP) and NTIA (BTOP)**

<b>Submitted Date:</b> 8/20/2009 3:10:30 PM		<b>Easygrants ID:</b> 3116	
<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program		<b>Applicant Organization:</b> City of Madison	
<b>Task:</b> Submit Application - Infrastructure Programs		<b>Applicant Name:</b> Mr. Richard A Beadles	

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## A. General Application Information

1. Applicant Information	
1-A. Name, Address, and Federal ID for Applicant	
<b>i. Legal Name:</b>	City of Madison
<b>ii. Employer/Taxpayer Identification Number (EIN/TIN):</b>	396005507
<b>Street 1:</b>	210 Martin Luther King Jr. Blvd.
<b>Street 2:</b>	Room 500
<b>City:</b>	Madison
<b>County:</b>	USA
<b>State:</b>	WI
<b>Country</b>	United States
<b>Zip/Postal Code:</b>	53707-3349

1-B. Name and Contact Information of Person to be Contacted on Matters Involving this Application:	
<b>Prefix:</b>	Mr.
<b>First Name:</b>	Richard
<b>Middle Name:</b>	A
<b>Last Name:</b>	Beadles
<b>Suffix:</b>	
<b>Telephone Number:</b>	608-261-9649
<b>Fax Number:</b>	
<b>Email:</b>	rbeadles@cityofmadison.com
<b>Title:</b>	Data Center Manager



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<b>1-C. Other Required Identification Numbers</b>	
<b>i. Organizational DUNS:</b>	076147909
<b>ii. CCR # (CAGE):</b>	3BHP1
<b>iii. Funding Opportunity Number:</b>	1
<b>iv. Catalog of Federal Domestic Assistance Number:</b>	<b>BTOP CFDA Number:</b> 11.557 <b>BIP CFDA Number:</b> 10.787 <b>BTOP CFDA Title:</b> Broadband Technology Opportunities Program <b>BIP CFDA Title:</b> Broadband Initiatives Program

**1-D Eligible Entities**

Please classify your organization. (Note: If there are multiple organizations involved in the project, designate the lead applicant that would enter into a Loan or Grant agreement with the Agency and assume operational and financial responsibility should an award be made). **Local, State, or Other Government Entity**

**1-E. RUS Borrower Status**

No

**1-F. Applicant Federal Debt Delinquency Explanation**

Is the Applicant Delinquent On Any Federal Debt? **No**  
**Federal debt delinquency Explanation:**

**2. Project Description & Project Title**

**2-A. Project Title:** Madison Broadband Initiative (MBI)

**2-B. Project Description:** This public/private collaborative project provides fiber-optic access to libraries, schools, public safety facilities and community centers, low cost wireless service throughout Madison and free or reduced cost wireless service to vulnerable populations. This project increases educational opportunities, creates jobs, improves public safety and stimulates use of the Internet and new technologies.



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**3. Application ID for Multiple Submissions for Identified Service Areas:**

**4. Rural Area Determination**

At least 75 percent of the proposed service area to be funded falls within rural areas that are unserved or underserved.

**No**

**5. Applications for Rural Areas:** Please choose the funding program(s) to which you are submitting this application.

a) BIP broadband infrastructure category to which you are applying:

b) Would you like this Application for Rural Areas to also be considered for BTOP funding?

c) BTOP Infrastructure category for which you are applying.

**Last Mile**

**6. Applications for All Other Areas: Per the NOFA, all applications to fund broadband infrastructure projects in areas that are less than 75% rural must be submitted to NTIA for consideration under BTOP.**

BTOP broadband infrastructure category to which you are applying: **Last Mile**

## **B. Eligibility Factors**

**7. Application Submission**

**BIP and BTOP Factors Selected By Applicant:**

**Applicant has submitted a completed application and provided all supporting documentation required for the application.**

**The Project will be substantially complete within 2nd year from the award date, and the project will be fully**



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<p>complete by the end of the 3rd year from the award date.</p>
<p>For projects seeking more than \$1 million funding, the Applicant agrees to submit a certification, from a Professional Engineer, that attests that a) the system will deliver the stated performance; and b) the projected project will be substantially completed within two years, and fully completed within three years.</p>
<p>The Applicant provides two-way data transmission with advertised speeds of at least 768 kbps downstream and 200 kbps upstream.</p>
<p>Applicant understands and agrees to comply with the nondiscrimination and interconnection obligations outlined in the NOFA.</p>
<p>If applying for a last mile Broadband Infrastructure project, applicant understands and agrees to comply with the last mile coverage obligations as outlined in the NOFA.</p>

<b>Additional Factors for BIP Selected By Applicant</b>

<b>Additional BTOP Factors Selected By Applicant</b>
<ul style="list-style-type: none"> <li>• <b>Conformity with Statutory Purposes</b></li> <li>• <b>Cost Sharing/Matching</b></li> <li>• <b>Reasonableness of Project Budget</b></li> </ul>
The project advances at least one of the statutory purposes for BTOP
Applicant has provided documentation that the project would not have been implemented during the grant period without federal grant assistance.



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Applicant has provided a budget that is appropriate to the proposed technical solution and only includes eligible costs.

- **Demonstration the Project Could not be Implemented But For Federal Grant Assistance**  
Applicant is providing matching funds of at least 20 percent towards the total eligible project costs?  
Yes

**7-k. Cost Sharing/Matching Fund Explanation**

## C. Executive Summary

### Executive Summary of Project for BIP and BTOP:

#### 8. Infrastructure Projects Executive Summary

The purpose of the Madison Broadband Initiative (MBI) is to provide free, low-cost or competitively priced broadband service to anchor tenants and vulnerable populations through fiber deployment and a Wi-Fi mesh network. 80 miles of fiber will provide last mile connectivity to 82 anchor public sector facilities and a high-speed Wi-Fi mesh network covering 28 square miles and will reach 35,128 households and 3,703 businesses in areas where 40% or more of the population is underserved. MBI is a collaborative effort between public and private entities including the City of Madison, the Madison Metropolitan School District, Dane County, Xiocom (Doing Business As MadCity Broadband (MCB)), University of Wisconsin-Madison and DANEnet.

a) Opportunity the proposed system seeks to address

For several years, technology staff from the City of Madison, the Madison Metropolitan School District, Dane County, and the University of Wisconsin-Madison had frequent meetings to discuss problems with broadband access, capacity and cost. The group desired to collaborate on fiber runs to connect institutions, provide broadband access for vulnerable, at-risk populations of the metropolitan area, meet rapidly changing needs of public safety and more affordably serve public schools. Until now, only a few small-scale projects have been implemented due to



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construction and deployment costs and annually declining public sector budgets. Furthermore, insufficient projected short-term return on investment has failed to entice the private sector to meet public sector needs and serve underserved areas. MBI seeks to address the need for consistent, affordable access to broadband services for anchor tenants and vulnerable populations.

b) General description of proposed funded service areas (location, number of communities, etc.)

MBI includes 4 service areas supported by a 28 square mile high-speed Wi-Fi Mesh network. The MBI mesh network will include 83,864 people in 35,128 households within 1,070 Census Blocks. These service areas include areas of high-intensity poverty, high participation in income-qualified assistance programs and large numbers of families with children as determined by the City of Madison's Neighborhood Indicators Project. In addition, this project includes 80 miles of fiber including laterals to 82 anchor institution facilities and close access for over 200 non-profit entities.

c) Number of households and businesses passed

The 4 service areas for Wi-Fi mesh include 35,128 households and 3,703 businesses. The 80-mile fiber route reaches an additional 60,000 residents, 24,000 households and passes about 3,000 employers.

d) Number of community anchor institutions, public safety entities, and critical community organizations passed and or involved with the project

In total, 82 anchor institutions and public safety entities will be served, comprising 43 City of Madison sites including 4 fire houses, a fire training center, 3 police stations, 26 water wells and towers, and 3 city bus transfer sites, plus 35 schools that provide public education and serve as Red Cross emergency shelters, and the Dane County Job Center. The 5 critical organizations involved with MBI design are City of Madison, Madison Metropolitan School District, Dane County, University of Wisconsin-Madison, DANEnet and Xicom/MCB.

e) Proposed services and applications for proposed funded service areas and users MBI will provide the following services: 1) free or reduced broadband rates for 45 small businesses specifically identified by the City of Madison Department of Civil Rights as minority and small disadvantaged businesses (SDBs), as defined by the 1974 Small Business Administration's (SBA) 8(a) Program; 2) free or reduced broadband rates for socially and economically disadvantaged students and their families; 3) reduced broadband rates for students of the Madison Metropolitan School District and college students attending the University of Wisconsin and the Madison Area Technical College; 4) ability to deploy live video and



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telemetry equipment within ambulances and other first responder vehicles to improve patient care and enable the efficient and remote management of public emergencies; 5) significant upgrades in video surveillance capabilities for the City of Madison [value demonstrated in 2009 by crime captured on video, leading to quick plea-bargain] as well as expansion of this system for school district facilities. In addition to high speed Wi-Fi, this proposal provides 80 miles of fiber connecting 82 facilities including 43 City sites including 4 fire houses, a fire training center, 3 police stations, 26 water wells and towers, and 3 city bus transfer sites, plus 35 schools that provide public education and also serve as Red Cross emergency shelters, and the Dane County Job Center.

f) Approach to addressing non-discrimination and interconnection obligations MBI will offer wired and wireless services via fiber optic cable and wireless radio consistent with the NTIA BTOP NOFA non-discrimination and network interconnection obligations with ubiquitous and pervasive network access that is open and affordable using open, standard protocols. MBI supports network neutrality and will not limit, restrict, prioritize or otherwise hinder system users' access to any lawful Internet content, applications or services of their choice except for reasonable system preservation purposes (e.g. security events). MBI will offer services on a best effort basis with all services subject to the legal needs of law enforcement. MBI provides a multi-function network infrastructure with the capability of providing high-speed broadband service to different customer equipment types that use a Wi-Fi connection such as computers, laptops and netbooks, PDAs, smart phones, etc. This project also provides an open network infrastructure platform capable of supporting applications that require Internet broadband access. As an example of technical openness, MadCity Broadband currently has signed agreements with nation-wide roaming ISPs including iPASS and Boingo and wholesale agreements with a local ISP, Merrimac Communication, Inc. (non-discrimination and interconnection obligations are addressed in detail in response to Questions 22 and 38).

g) Type of broadband and system that will be deployed (network type and technology standard) MBI will use standards-based Wi-Fi (2.4GHz b/g/n) and FTTx (Fiber To The Home/Office) to provide multi-megabit broadband service to underserved areas of Madison. All anchor tenant locations will be connected through "dark fiber" creating a Metro-Area-Network (MAN) between all locations capable of 10 Gbps data transport speeds.

h) Qualifications of applicant demonstrating ability to implement and operate a broadband infrastructure and/or be a sustainable broadband services provider

MBI is a collaborative effort between public and private entities wherein Xicom (Doing Business As MadCity Broadband (MCB)) will build, operate, and act as the service provider



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for the network and City of Madison, Madison Metropolitan School District and Dane County will be anchor tenants with Right to Use agreements with MCB. MCB, the current service provider and network operator of the 11-square-mile indoor and outdoor Madison metropolitan Wi-Fi network, is organizationally ready to implement and manage the MBI network. MCB has built and manages indoor and outdoor multi-function networks in Wisconsin and Florida and manages a country-wide wireless network in the Dominican Republic. MCB now provides Wi-Fi services to over 2,200 Madison apartment units, Dane County Regional Airport, University of Wisconsin Hospital and Clinics, and the Federal Bankruptcy Court House. MCB has an operations support infrastructure with established network management procedures and trained staff that provides services to business travelers, residential, apartment complexes, small and medium businesses, and City of Madison government agencies. This includes primary and backup customer and network operation centers with multiple trained and experienced staff serving 3 overlapping shifts and redundant communications and network monitoring systems. MCB has sales, operations and billing support systems in place and effectively serving 2,200 residential and business customers. MCB outsources 24/7 level 1 and level 2 billing and customer support to Customer Direct, a St. Louis based company specializing in customer services for the Internet Service Provider and Hospitality Industry, and E&A, a company specializing in temporary labor skilled in outside plant installation and maintenance services. MCB's core competency, network design and application integration, is kept in-house. MCB has 3 network-IP engineers, 2 business application integration engineers, and 2 network infrastructure engineers with over 55 years combined experience(response to Question 38 contains additional details on readiness). The free and reduced-cost broadband services available through MBI to underserved populations are sustainable per the MBI financial forecast (5-year pro forma provided in response to Question 50) which demonstrates that a portion of revenue generated from subscribers will be used to continue free and reduced-cost services to vulnerable populations.

i) Overall infrastructure cost of broadband system

MBI's overall infrastructure cost (fiber and Wi-Fi broadband system) is \$20,598,625 for which we seek 77.9% of the funding through BTOP.

j) Overall expected subscriber projections for project

Within Wi-Fi service areas in vulnerable high-intensity neighborhoods described in b) above, service subscription rates are predicted to be 29.3% for households and 27% for businesses in 5 years.

k) Number of jobs estimated to be created or saved as a result of project



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1,026 jobs will be created from this \$20,598,625 MBI project. Computations are based on the work of Atkinson, et al. Jan.2009.

**Description of BTOP Project Purpose (BTOP Applicants Only Next Three Questions)**

**9. BTOP Statutory Purpose:**

Provide improved access to broadband service to consumers residing in “underserved” areas of the United States.
Provide broadband education, awareness, training, access, equipment, and support to schools, libraries, medical and healthcare providers, community colleges and other institutions of higher education, and other community support organizations by or through these organizations.
Provide broadband education, awareness, training, access, equipment, and support to organizations and agencies that provide outreach, access, equipment and support services to facilitate greater use of broadband service by low-income, unemployed, aged, and otherwise vulnerable populations.
Provide broadband education, awareness, training, access, equipment, and support to job-creating strategic facilities located within a defined economic zone, or community as designated by a State authority, Department of Commerce , HUD or USDA.
Improve access to, and use of, broadband service by public safety agencies.
Stimulate the demand for broadband, economic growth, and job creation.

**10. Description of BTOP Project Purpose:**

a) Project addresses compelling problem or presents opportunity consistent with BTOP goals. Madison Broadband Initiative (MBI) anchor tenants have been struggling to secure access to affordable and scalable broadband for many years. To date, critical broadband service options have been cost-prohibitive or non-existent. Additionally, vulnerable low-income populations have remained underserved by incumbent service providers with poor service or prohibitively high subscription rates.

b) Project offers effective solution to the problem/addresses the opportunity and c) Proposed solution demonstrates broad significance and includes development that can be replicated to



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improve future projects. The purpose of MBI is to provide free, low-cost or competitively priced broadband service to anchor tenants and vulnerable populations through fiber deployment and a Wi-Fi mesh network. 80 miles of fiber will provide last mile connectivity to 82 anchor public sector facilities and a high-speed Wi-Fi mesh network covering 28 square miles and will reach 35,128 households and 3,703 businesses in areas where 40% or more of the population is underserved. Through a private sector collaboration, a portion of revenue generated through subscription fees (expected to exceed \$600,000 per year by year 3) will support free and reduced cost broadband service to vulnerable populations. Access to low-cost broadband by underserved and vulnerable populations and community institutions and anchor institutions, including organizations serving at-risk populations and job centers, will stimulate use of broadband and generate economic growth and create jobs in the cities of Madison, Monona and Middleton, towns of Madison and Blooming Grove, and villages of Maple Bluff and Sherwood Hills. MBI will improve access to and use of broadband for public safety as described in e3 below. MBI will enhance delivery of healthcare services and significantly advance educational opportunities for adults and children, with a special focus on economically disadvantaged families and socially and economically disadvantaged small businesses. MBI models inter-agency public sector collaboration, public/Not-For-Profit collaboration and public/private collaboration. The MBI business model, involving collaboration between public agencies and the private sector [see responses to Questions 44, 45, 46] has broad significance locally and can be a valuable national model.

d) Proposed funded service area is unserved or underserved

MBI's proposed Wi-Fi mesh service areas encompass 28 square miles (1,070 Census Blocks) and 83,864 people currently underserved by broadband access. In addition, these service areas are identified as areas of high-intensity poverty, participation in income-qualified assistance programs and families with children [see maps for Question 13 and Question 17 response] by the City of Madison's Neighborhood Indicators Project.

e) Extent to which the project addresses more than one statutory purpose

1. Provide improved access to broadband service to consumers residing in "underserved" areas through a) expansion of the MadCity Broadband (MCB) Wi-Fi network (currently covering 11 sq. miles of downtown Madison) to provide free or low-cost, 1 to 3 Mbps broadband service to vulnerable population areas encompassing over 8,000 low-income households [additional information on map provided with Question 12]; b) providing free or low-cost broadband access to 45 minority and disadvantaged small businesses (SDBs).
2. Provide broadband education, awareness, training, access, equipment and support to:



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Schools, libraries, medical and other healthcare providers, institutions of higher education: MBI will provide high speed Wi-Fi that will be used transmit secure video enabling remote access to live classroom participation by students unable to be in school for medical or other reasons and will provide 10 Gbps dual access fiber to 35 schools which also serve as Red Cross emergency shelters. Organizations and agencies that provide outreach, access, equipment, and support services to facilitate greater use of broadband service by low-income, unemployed, aged, and otherwise vulnerable populations: MBI will collaborate with DANEnet, a 501(c)(3) non-profit organization serving 18 Dane County non-profit organizations, including Community Centers, since 1995 through on-site technical support, training, planning and consulting. DANEnet is dedicated to helping Dane County non-profits find and use quality and affordable information technology. MBI will enable DANEnet to increase services with free or reduced rate connectivity to Community Centers and other non-profits serving vulnerable populations providing support for streaming video and online classes, educational programs and training.

3. Improve access to and use of broadband service by public safety agencies by: a) providing secure communications for police and fire emergency vehicles in the field via the Wi-Fi network; b) supporting higher resolution and increased frame rates for existing surveillance cameras and simplifying quick installation of cameras in “hot spot” crime areas; c) providing access to enterprise application information for field staff, including building inspectors, fire inspectors, health department nurses and inspectors and property assessment staff; d) using GPS-like positioning using the mesh network to track and dispatch emergency, public works and public transportation vehicles; e) facilitating rapid emergency placement of multiple-angle simultaneous video feeds 1st responder emergencies to improve on-site or central command control; f) enabling live video and patient vital sign feeds from ambulances directly to hospital-based, emergency care professionals; g) installing surveillance cameras in and around the Madison Metropolitan School District buildings and providing the Madison Police Department with secure access to live and archived video from these cameras from district offices, mobile command centers, or police vehicles.

4. Stimulate demand for broadband, economic growth, and job creation by: a) demand for broadband By providing free or low-cost broadband access to underserved and vulnerable populations, broadband access to community and anchor institutions and organizations serving at-risk populations or job centers, as well as improving access to and use of broadband for public safety, this project will stimulate demand for and use of broadband. b) economic growth and c) job creation Following the model of Atkinson et al. Jan. 2009 MBI’s \$20,598,625



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project would generate 1,026 jobs. Furthermore, MBI will offer broadband access to end-users at wholesale cost through any service provider pairing with MadCity Broadband (MCB), stimulating economic growth for local providers. MCB is a wireless licensed and unlicensed infrastructure provider that designs, deploys, and manages the current 11 sq. mile Madison municipal wireless network using Cisco Wireless Mesh Architecture, Wimax and pre-wimax products. Merrimac Communications (a local area service provider), iPass and Boingo (national providers) already wholesale services on MCB's current data network. In addition, allowing anchor institutions to lock in telecommunication rates at or below current rates for a long term, with future services controlled by the anchor institutions at no additional cost, provides budget stability for these institutions.

**11. BTOP Enhanced Services for Health Care Delivery, Education, and Children:**

MBI will enhance broadband service for health care delivery, education and children as contemplated by the Recovery Act in the following ways:

Health care delivery:

- MBI will enable deployment of a WiFi network similar to that used in Tucson, AZ for Fire and Rescue. In Tucson, all ambulances are equipped with a system that enables critical patient information to be shared with hospitals in real-time. This system uses a 12-lead patient telemetry system and live video connection allowing hospital medical staff to remotely assist 1st responders with patient care while patients are en route to a hospital.
- MBI will enable public health nurses to provide wellness clinics, health education, and other public health programs utilizing broadband to access patient records and other medical information in Community Centers, libraries and other non-traditional locations that are more readily accessible to disadvantaged families who may lack transportation or have other barriers to attending health clinics in other areas of the city.
- City-wide WiFi will provide access for all citizens to public announcements from the City, the Madison Metropolitan School District (MMSD) or Centers for Disease Control and Prevention, to aid response to any pandemic event or other public health emergency.

Education and Children:

- City-wide high-speed WiFi communications will provide the infrastructure to support adult education programs sponsored by MMSD, Madison School and Community Recreation (MSCR) and local non-profits providing educational programs and services to at-risk populations.
- Fiber to 18 Community Centers, non-profit agencies targeting vulnerable populations, and job centers will enable adult education and GED programs to access online services and



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collaboration tools which they can not currently provide.

- High-speed, redundant fiber connectivity to 35 MMSD buildings, not reached by the Madison Unified Fiber Network (MUFN) project (a middle-mile project proposed in a separate BTOP application), will provide capacity necessary to support new instructional initiatives requiring the use of multi-location, distance video collaboration and high throughput demand graphics applications.
- High-speed fiber and WiFi access will enable interactive video classroom participation by home-bound and incarcerated children.
- 45% (13, 403 students) of MMSD's student population qualifies for the USDA free/reduced lunch subsidy program, a common indicator of poverty status. Successfully reaching and engaging these children is one of MMSD's key goals defined in the MMSD 3-year Information & Technology Plan certified by the WI Dept. of Public Instruction in compliance with the federal eRate program. MBI provides high-speed WiFi infrastructure necessary to design a free and low-cost netbook program for disadvantaged children to level the playing field in educational opportunities. While the netbook program is not a part of this proposal, MBI has a crucial part in setting the stage to make the netbook program possible. MBI helps ensure ease of access to technology for all children--an important way to address the digital divide.

## **D. Proposed Funded Service Area**

### **12. Proposed Funded Service Area Maps:**

**12-A.** Service Area Map (Reference Number): **BAC6-2A74-484E-AA15**

**12-B.** Is the applicant is seeking a waiver for providing less than 100% coverage of a census block. **No**

### **13. Proposed Funded Service Area (BIP - Last Mile Projects):**

Please refer to section M at the end of document.

### **14. Proposed Funded Service Area (BTOP - Middle Mile Project):**

Please refer to section M at the end of document.

### **15. Non-Funded Service Area( BIP Only):**



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**16. Coverage Waiver:**

Applicant is seeking a waiver for providing less than 100% coverage of a census block.

No

For Response of "Yes" please refer to upload section for additional supporting documentation.

**17. Methodology for Area Status:**

Note: The methodology described here is graphically portrayed on the map provided in response to application item #12. The City of Madison's Neighborhood Indicators Project played a critical role in identifying target MBI neighborhoods. Neighborhood Indicators is a compilation of key data designed to show what Madison's neighborhoods are like and how they are doing. As identified by the Pew Research Center in its findings presented to the National Broadband Strategy Symposium, income is one of the largest barriers to broadband use. Accordingly, several fields in Neighborhood Indicators relating to family income, presence of children, businesses and public facilities were reviewed to identify MBI target areas. Data is summarized by Census Block Groups and City of Madison planning districts that are largely governed by Census Bureau geographies.

Families with children. The source of this data is Claritas, which provides current demographic estimates based on 2000 Census data and made current by various formulas and assumptions. This represents the estimated percent of households that are families with children. Estimates are for 2008. This data helps identify concentrations of school-aged and younger children who will be major beneficiaries of free and reduced cost wireless Internet access.

Participation in income-qualified assistance programs. The source of this data is the Dane Co. Dept. of Human Services based on the WI Dept. of Children & Families' CARES database. It identifies the number of families with 1 or more minor children who received Medical Assistance, Food Stamps &/or W-2 (welfare-to-work) benefits in September 2007. This indicates the concentration of families in financial need.

Free and reduced lunch. The source of this data is MMSD's Third Friday of September 2007 counts. It represents the percent of MMSD students participating in the free or reduced cost lunch subsidy program, a common indicator of poverty. It is limited to students who participate in the school lunch program, which is governed by the USDA Free & Reduced Lunch Program regulations. This data provides our most current estimate of family income levels and represents families in need.

In addition to these fields from the Neighborhood Indicators Project, data points were analyzed



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to determine the potential for connecting public facilities and disadvantaged businesses to the Internet with a wireless mesh.

Disadvantaged businesses. The WI Uniform Certified Program (UCP) directory of disadvantaged businesses identifies companies meeting criteria established by the Small Business Administration (SBA) 8a program. It identifies disadvantaged businesses that would be connected with free and reduced rate wireless Internet access by this MBI project. Combined overlay. To identify target areas, fields of families with children, income qualified assistance, and free and reduced lunch were combined. An overlay is based on each field's top quartile. If an area ranks in the top 25% of families with children, it receives a value of 1. This is done for each field and area and numbers are added together. This builds a simple intensity map for values 0 to 3 with data points added to identify facilities and disadvantaged businesses that would be connected to wireless Internet access by a fiber ring.

Neighborhood Indicators data for 2008 covering the entire City of Madison will be made publicly available in September 2009 at <http://www.planning.wisc.edu/madison/Index.html>.

**18. Middle Mile Benefits**

## **E. Proposed Service Offering**

**19. Broadband Service Offerings for Last Mile Project:**

Please refer to upload section at the end of the document.

**20. Service Offerings for Middle Mile Project:**

Please refer to upload section at the end of the document.

### **Competing Service Providers**

**21. Existing Broadband Service Providers and Services Offered:**

Please refer to upload section at the end of the document.

### **Non-Discrimination, Interconnection**



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**22. Description of Network Openness:**

MBI will offer wired and wireless services via fiber optic cable and wireless radio consistent with the NTIA BTOP NOFA non-discrimination and network interconnection obligations with ubiquitous and pervasive network access that is open and affordable using open, standard protocols. MBI supports network neutrality and will not limit, restrict, prioritize or otherwise hinder system users' access to any lawful Internet content, applications or services of their choice except for reasonable system preservation purposes (e.g. security events). MBI will offer services on a best effort basis with all services subject to the legal needs of law enforcement.

As an application integrator, network infrastructure builder and service provider for the MBI project, Xiocom Wireless (Doing Business As Mad City Broadband (MCB)) currently owns and manages an eleven square mile, City-Wide indoor/outdoor Wi-Fi network. This wireless network acts as an Internet service provider to business travelers, residential customers, a federal agency (Federal Bankruptcy Court), a health care institution (University of Wisconsin Hospital and Clinics) and businesses. MCB also has a signed wholesale agreement with Merrimac Communication (a Madison, WI based Internet service provider) and signed roaming agreements with aggregate Internet service providers such as iPASS and Boingo Wireless that currently provide roaming services to service providers such as AT&T, Verizon Business, Sprint, British Telecom, and more. This clearly demonstrates that MCB complies with the NOFA's non-discrimination and openness principles as follows:

- adherence to principles contained in the FCC's Internet Policy Statement;
- connection to public Internet directly or indirectly, such that the project is not an entirely private closed network ;
- offering interconnection at reasonable rates and terms to be negotiated with requesting parties.

Further, MCB clearly demonstrates its willingness to support the principle of "not favoring any lawful Internet applications and content over others" by working with City of Madison to make its "Downtown Safety Initiative" a success. In this initiative the City of Madison Police Department uses video surveillance cameras to monitor a high crime area located in the heart of downtown Madison. MCB also supports Ji-Wire, the leading mobile audience media company, to provide location-based content application over the MCB wireless network.



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Lastly, MCB uses a subscriber portal page to assure transparency and openness by displaying network management polices and providing notice to customers of changes to policies. A copy of this network management policy can be found at <http://www.madcitybroadband.com/auth-web/aup.html>.

These interconnection, non-discrimination, and network management practices will be maintained and utilized while using BTOP funds to implement MBI.

**Non-Discrimination and Interconnection (BTOP applicants only for next three questions)**

**23. Non-Discrimination Obligations (applicable to Last Mile and Middle Mile Applicants):**

Adhere to the minimum non-discrimination requirements as set forth in the NOFA.
Display the nondiscrimination practices in a prominent location on the service provider's web page, and provide notice to customers of changes to these policies.

**24. Interconnection Obligations (applicable to Last Mile Applicants):**

Adhere to the minimum interconnection requirements as set forth in the NOFA.
Display the interconnection policies in a prominent location on the service provider's web page, and provide notice to customers of changes to these policies.
Commit to offering wholesale access to the project facilities at reasonable rates and terms.
Commit to binding private arbitration of disputes concerning interconnection obligations.



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**25. Interconnection Obligations Middle Mile Applicants:**

**Cost Effectiveness and Affordability**

**26. Cost per Household (BTOP only):**

Total Project Cost: \$20,598,625  
Total Households: 59,128  
Total Cost per Household: \$348.37

A household count of 35,128 is derived from the 28 square mile under-served service areas to be supported by a high-speed Wi-Fi Mesh and a count of 24,000, are households passed by our proposed 80 mile fiber loop. This provides a total household count of 59,128 by which we derive the cost per household, following instructions provided in the BTOP Grant Guidelines.

However, this calculated cost is erroneously high. Our total project costs include lateral fiber connections to 82 anchor institutions, RTU costs and funding for wireless LANs within schools and these costs are not directly associated with actual household services. If these expenses were removed from our total project cost, the cost would be under \$220 per household.

**27. Affordability**

Xiocom Wireless (Doing Business As Mad City Broadband (MCB)) is the MBI application integrator, network infrastructure builder and service provider. MCB's service pricing is more affordable than the service pricing of all four other providers in the MBI target area (Sprint, Verizon, AT&T, Charter Communications) [additional information on proposed service offerings and pricing and competitors' service offerings and pricing is provided in Attachments A and C]. MCB provides more bandwidth compared to these vendors for mobile users of wireless laptops, handheld devices, and smart phones. MCB network access is available both within residential and commercial facilities as well as for roaming outside users.

MCB offers multiple tiered broadband services to different target customer groups based on individual income. For example, MCB offers a service package that targets college students in



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Madison, WI and provides reduced rate packages without any hidden fees (25% off the standard entry level Manufacturers’ Suggested Retail Price). No scaled cost service like this is currently available through any other service provider. It is also MCB’s intention to work with the City of Madison and Madison Metropolitan School District (MMSD) to provide free and/or reduced cost services to economically disadvantaged students. The City and MMSD will use United States Department of Agriculture Free and Reduced Rate Lunch criteria to qualify students for this program. This cost of providing free and/or reduced services to economically disadvantaged students will be supported by a percentage of revenue generated by MBI network use of residential and commercial customers. For businesses, MCB offers small and medium sized businesses services similar to that offered by AT&T and Charter but at a 60% reduced price.

MCB will provide the City of Madison, MMSD, and Dane County with increased bandwidth at reduced and/or no cost, saving the school district alone several hundred thousand dollars a year. Since the City of Madison, Dane County and the MMSD are all projecting very significant budget shortfalls for 2009 – 2010 and beyond, telecommunications services savings will be a significant help to the citizens of Madison and the stability of the local economy.

## F. Technology Strategy

### 28. Technology Type:

Wireline - Fiber-optic Cable
Other

**Other:** Fiber: FTTx Wireless: WiFi MESH

### 29. System Design

The MBI project requests funding for a last mile terrestrial fiber and Wi-Fi MESH data transport system. The system will connect end-users to the Internet and to two major aggregation points in Madison, WI where Internet service provider (transit) choice and



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settlement-free network peering occurs.

#### Fiber Backbone

MBI facilities will use right-of-way (ROW), conduit and fiber, where present, under existing, agreements (contracts) with the City of Madison (MadisonCI), Mad City Broadband (Xicom Wireless, Inc.) and the Middle Mile BTOP proposal MUFN (See BTOP middle mile proposal titled Metropolitan Unified Fiber Network (MUFN). Mad City Broadband (MCB) is the local operator of an 11 square mile Wi-Fi MESH network to the downtown Madison, WI area. MCB designed and built this network over three years ago. The MBI project will have a twenty year RTU (Right-to-Use) contract with MCB for all of the fiber backhaul used in this last mile project. The City of Madison is contributing over 40 miles of underground conduit and all City of Madison facility rooftops, towers and water towers are available to site radios in this project. Rooftops of Madison Metropolitan School District buildings are also available to site radios.

#### Wi-Fi Connectivity for Homes

MBI will use the Cisco Unified Wireless Access System as the main last mile connectivity to the end user; this is a standards based 802.11 b/g/n 2.4GHz unlicensed (Wi-Fi) wireless solution. This product is the “quickest to market” and “ease-of-use” product in the industry. The transformative nature of wireless networking (Wi-Fi) drives and also feeds an insatiable appetite for network-connected devices and the access to online resources. Most people today have at least one Wi-Fi-enabled device, but many are starting to carry more than one (ie. a dual-mode phone, a laptop computer, etc...). Users are also becoming accustomed to finding an available network that they can connect those devices to while at home, at work, or on the go, which in turn drives the need for ubiquitous network connectivity. The Cisco 1500 series outdoor access point and the Cisco 1140 series indoor access point will be used when building the Wi-Fi portion of the network for both the outdoor and indoor network. These radios support the 802.11n wireless technology which the Wi-Fi Alliance has certified the de facto industry standard with every leading provider testing against Cisco's technology to ensure 802.11n compatibility.

#### Wi-Fi Connectivity for Schools

The proliferation of these network-connected devices for students and teachers alike is creating an undeniable need for high capacity deployments as more and more users connect to the same



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network with multiple devices for different reasons. This need is only exacerbated in areas where people tend to congregate in large numbers. The proposed 802.11n solution has been particularly successful in education environments for that same reason. Consider a large lecture hall or classroom where many students congregate during class and are connecting to the wireless network with their laptop computers in order to download the instructor's presentation slides and notes or conduct parallel, online research on the discussion topic of the day.

The MBI proposal seeks funding for:

1. A ubiquitous Wi-Fi network in service areas one through four on the Service Area map. The network has been designed for 95% coverage of all homes and buildings within the service areas.
2. A ubiquitous indoor Wi-Fi network throughout all school buildings within the Madison Metropolitan School District. The network has been designed for 100% Wi-Fi coverage of all buildings and surrounding outdoor school property.
3. A Right to Use Contract with MCB for four strands (six where applicable) of fiber on the 80 mile fiber backbone to be used in conjunction with areas covered by the MUFN fiber project (See BTOP middle mile proposal titled Metropolitan Unified Fiber Network (MUFN)).
4. Eighty-two fiber laterals to interconnect critical community facilities, anchor institutions and public safety entities to the MBI Fiber backbone. Each lateral will be a diverse path, due in part to the nature of aerial fiber topology.
5. Equipment to support a 10Gbps fiber network to all schools in the Madison Metropolitan School District. The district already uses Cisco 3750 CORE switches at the school locations. The 10Gbps 3750 switches will simply be joined to the current Cisco switch stack at each school, minimizing expense.

Each conduit lateral will have entrance diversity with one 1¼” conduit per path. A pre-terminated 12 count single-mode fiber optic cable will be pulled through one of the conduits with all strands terminated inside the end-user building on a rack-mounted fiber termination panel though only required strands will be initially spliced onto specific buffer tubes on the backbone fiber.

Conduit and fiber paths are designed in a ring topology. The MBI aerial fiber is designed as six basic core rings (see Network Diagram in Question 30). Redundancy of these rings is augmented through the use of fiber on the MUFN project “underground” fiber network. All



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MBI fiber rings have at least two aerial points of entry and two MUFN points of redundancy; there are twelve facilities in which MBI and MUFN cross-connect to each other and three points at which MBI cross-connects to existing City of Madison fiber. The above fiber design allows for maximum uptime and greater throughput.

The MBI fiber rings directly pass over two-hundred Not for Profit organizations, Community Centers and other such entities. Through MCB, these end-users may obtain Internet service or point-to-point paths (through an FTTx type of product) from their location(s) to other network locations of their choice or to one of two network aggregation locations. The aggregation locations will allow end-users to directly connect with the provider of their choice or connect to the MadIX (Madison Internet Exchange). Due to the nature and ease of installation of aerial fiber “drops” (much the same as CableTV or Telephone), connections to these organizations will be cost effective and compatible with new technologies as they are released.

#### 10Gbps Connectivity for Schools

The Madison Metropolitan School District will use Ethernet for the WAN architecture between the individual schools and the primary and redundant Network Operation Centers (NOC). High-capacity port costs are lower than other options and are readily available. MBI selected Cisco given the strong relationship MCB and City of Madison have with Cisco and the significant price discounts and staff product knowledge of Cisco. The pair of fiber the School system will use on the six aerial fiber rings will collapse into both NOCs. Cisco 7609 series chassis routers will be used as the main aggregation point in both datacenters. The platform is a nine slot chassis capable of 40Gbps of throughput per slot and a total 720Gbps of throughput per chassis. In the design the chassis will:

- Use Dual Router (supervisor blades) to provide for the core routing platform of the chassis (with redundancy).
- 10gig Interface blades will terminate the six main fiber rings to the schools.
- FastEthernet and GigEthernet blades provide for server connectivity.
- Aggregate the Wireless LAN controllers which are a dual controller blade. IT will require three blades per chassis to offer redundancy for indoor wireless in schools.

The Cisco Unified Wireless solution will also be deployed throughout schools in the District. The system will use the 1140 series 802.11 a/g/n wireless access point to deliver network connectivity to students, teachers and staff. This system will compliment the ubiquitous nature of the entire wireless design for all service areas. The Madison Metropolitan School District



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will be able to provide an SSID with content of their choosing throughout the entire Wi-Fi network via peering with the City of Madison and Mad City Broadband's Controller infrastructure.

#### City of Madison Connectivity

The City of Madison (CoM) will use two strands of single mode dark fiber to connect the various Police, Fire, Water Utility and other agencies to the City of Madison Network Operation Centers. The City runs two data centers for full redundant failover ability. The CoM will use existing Cisco switch infrastructure to "light" the fiber provided by the MBI project.

City agencies will also peer to the Wi-Fi network to provide mobile connectivity to the city workers, Police and Fire. The CoM already uses the Cisco unified wireless solution and has already peered with MCB for ubiquitous downtown coverage using a CoM SSID on the MCB network. The Cisco wireless controllers are able to pass SSID client and management traffic directly between networks. This allows for seamless client roaming between the networks. Once complete the CoM and MCB will also peer with the MMSD wireless network, thus allowing more and more seamless roaming throughout buildings and the City.

#### Upgrade path

MBI anticipates several upgrades and enhancements over time:

- The RTU allows the MBI fiber infrastructure to grow as the MCB fiber infrastructure grows. Adding connectivity to more community centers and Not for Profit organizations will become available due to this expected expansion.
- Using the Unified Wireless system allows the City and the Madison Metropolitan School District to expand Wi-Fi coverage as MCB expands theirs. This is accomplished through controller peering efforts.
- Using the modular design of the Cisco 1500 and 1140 series access points for the Wi-Fi network allows for an upgrade path as new standards are released.



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**30. Network Diagram:**

Please refer to upload section at the end of document.

**31. Certification by Professional Engineer:**

Please refer to upload section at the end of document.

**32. Buy American Waiver Request:**

Is the applicant seeking an individual waiver of the Buy American provision? **No**

**Buy American Waiver Request – Legal Justification**

**33. Choice of Service Provider:**

Does the project’s Infrastructure and the Company’s business plan allow more than one provider to serve end users in the proposed funded service area?

**Yes**

## **G. Project Milestones and Completion Factors**

### **Timeline & Milestones**

**34. Infrastructure Build-out Timeline:**

Please refer to upload section at the end of the document.

**35. Licenses, Regulatory Approvals and Agreements:**

The following, lists relevant licenses, regulatory approvals and agreements and their status:

1. City of Madison  
City Encroachment (Signed)



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2. Madison Gas & Electric  
License Agreement for Conduit Occupancy (Signed)  
License Agreement for Wireless Internet Attachments to Distribution Poles (Signed)  
Pole attachment Agreement (Signed)

3. Data Center  
222 Network (Signed)

4. Roof Top  
West Wash Associate (Signed)  
Capitol Centre (Signed)  
Park Tower (Signed)  
Diplomat (Signed)  
Patrick Properties (Signed)  
Pinnacle Tower (YWCA) (Signed)  
Colonial Motel (Signed)

**36. Construction and Vendor Contracts**

Extent to which MBI relies on contractors and/or vendors to deploy network facilities All network facilities deployment will be conducted by contractors and/or vendors. The City of Madison Common Council has a resolution before it that will allow the City to negotiate a contract with Xiocom Wireless (Doing Business As MadCity Broadband (MCB)) for wireless mesh network services. The draft contract will provide for unlimited wireless network services for the City of Madison while allowing MCB to use City-owned infrastructure, for support of their mesh network, at no cost. This resolution is scheduled for discussion and adoption at the September 1, 2009 Common Council meeting. In turn, MCB holds contracts with several entities which will be responsible for various project components as follows:

- E&A (signed contract on file) to perform network infrastructure installation and maintenance;
- Hauk Power, Inc. (signed contract on file) to perform wireless radio installation;
- Madison Gas & Electric (signed contract on file) electric service to assist MCB with the installation of underground fiber for all MG&E conduit;
- Universal Electric (contract in progress) to assist MCB with fiber terminations.



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**Qualification of Management Team and Organizational Readiness**

**37. Management Team Resumes:**

Please refer to upload section at the end of the document.

**38. Organizational Readiness:**

MBI is a collaborative effort between public and private entities wherein Xicom (Doing Business As MadCity Broadband (MCB)) will build, operate, and act as the service provider for the network and City of Madison, the Madison Metropolitan School District and Dane County will be the anchor tenants with Right to Use agreements with MCB. MCB, the current service provider and network operator of the 11-square-mile indoor and outdoor Madison metropolitan Wi-Fi network, is organizationally ready to implement, manage and maintain the MBI network. MCB has built and manages indoor and outdoor multi-function networks in Wisconsin and Florida and manages a country-wide wireless network in the Dominican Republic. MCB currently provides Wi-Fi services to over 2,200 Madison apartment units, Dane County Regional Airport, University of Wisconsin Hospital and Clinics, and the Federal Bankruptcy Court House.

MCB has an extensive operations support infrastructure with established network management procedures and trained staff that provides services to all business travelers, residential, apartment complexes, small and medium businesses, and City of Madison government agencies. This includes primary (St. Louis, MO) and backup (Atlanta, GA) customer and network operation centers with multiple trained and experienced staff serving 3 overlapping shifts, redundant communications and network monitoring systems available continuously. Other operations support systems include incident trouble ticket system, change management system, contact database and document management system for procedures and other information. MCB is compliant with CALEA to act as a service provider.

MCB has sales, operations and billing support systems in place and effectively serving 2,200 residential and business customers. MCB outsources 24/7 level 1 and level 2 billing and customer support to Customer Direct, a St. Louis based company specializing in customer services for the Internet Service Provider and Hospitality Industry, and E&A, a company



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specializing in temporary labor skilled in outside plant installation and maintenance services. MCB's core competency, network design and application integration, is kept in-house. MCB has 3 network-IP engineers with over 27 years combined experience, 2 business application integration engineers with over 14 years combined experience, and 2 network infrastructure engineers with over 13 years combined experience.

Furthermore, MCB is a firm believer in automated sales. While maintaining a strong sales organization and competitive agent programs, MCB has created a subscriber self-managed portal allowing current and potential subscribers to sign-up online and manage personally tailored services. We plan to provide free resources to unemployed citizens for job searches via this subscriber portal. MCB will not only provide services benefiting residents and businesses in Madison, Wisconsin, but will also enable our partners' customers (Merrimac Communication, Boingo, iPass) or other network users to access benefits provided by the MBI network.

MCB has been selected as one of the U.S. featured Cisco networks and has been working closely with Cisco and the City of Madison to test new products and solutions, including advances in video surveillance, location-based advertising, e-wallet and other new technologies. MCB, Cisco, and the City of Madison are aspiring pioneers in fostering alternate uses of the MCB/MBI network for emerging technologies. Additional information on the organizational management and governance is provided in the Xicom Wireless - Madison organizational chart (included in Item #39). MCB has the organizational readiness, the strong technical and operational capability, and the vision as the network integrator, operator, and provider to exceed all BTOP Last Mile requirements and help model effective public-private sector collaboration to improve broadband services to our community.

**Other**



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**39. Organizational Chart:**

Please refer to upload section at the end of document.

**40. Legal Opinion:**

Please refer to upload section at the end of document

**41. Government and other Key Partnerships:**

MBI partnership strategy: bring all necessary entities together to design and implement a high- quality project to deploy broadband in an underserved area. Partners: a)City of Madison (public) applicant with ultimate responsibility for implementation/fiscal management. MBI will provide high-speed fiber and Wi-Fi communications to over 40 facilities; b)Xicom (dba MadCity Broadband) (private) key application integrator, network infrastructure builder and service provider, will support free and reduced cost services to local vulnerable populations; c)Dane County (public) will be impacted by high-speed fiber and Wi-Fi communications serving 6 facilities including the County Job Center; d)Madison Metropolitan School District (public) will utilize 10G dual access fiber connectivity between primary and back-up data centers and 37 schools (remainder served by the separately proposed Madison Unified Fiber Network (MUFN)) and wireless LANs in all facilities to improve student access to instructional resources and public access to District resources. All District buildings are designated as Red Cross Emergency Shelters-high speed fiber access will support medical and 1st responder emergency communications; e)University of Wisconsin-Madison (public) will experience enhanced communication between the University and local K-12 education staff and via live interactive video access to Web 2.0/3.0 instructional resources; f)DaneNet (not-for-profit described in #10) will experience significant improvements in providing technical support and related services to 18 Community Centers and 65 other non-profits. Up to 5 staff from each entity collaborated for hundreds of hours to design MBI and will continue to work together during implementation. Another key partnership is with UW-Madison, the grant administrator of the MUFN proposal. MBI builds on MUFN; the proposals were collaboratively designed to assure complementary and non-duplicating services. Letters of support attached.

**42. Recovery Act and Other Governmental Collaboration.**

How project will leverage Recovery Act or other state or federal development programs and dollar values of programs:



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- MBI's success is linked to a separately proposed BTOP Madison Unified Fiber Network (MUFN), \$10,367,442 project;
- A Public Computer Centers BTOP round 2 proposal (dollar amount to be determined) will be developed and submitted through another collaborative effort by the City of Madison, the Madison Metropolitan School District, DANenet, the University of Wisconsin-Madison, Dane County and Xiocom Wireless and build on MBI and MUFN accomplishments;
- \$6.1 million IDEA grant in support of MMSD's 4,600 students with disabilities; a to-be-determined dollar amount will be used for professional development and technology pending Board of Education approval;
- \$5.2 million Title 1 grant to be used in support of 19 Title 1 schools; \$1 million of which will support technology pending Board of Education approval;
- \$3,020,000 Qualified School Construction Bonds (0% loan); \$880,000 of which will be allocated for technology pending the release of funds from the WI Department of Public Instruction;
- \$2,772,000 Qualified Zone Academy Bonds, \$1,635,000 of which will be allocated for technology

How collaboration will lead to greater project efficiencies

The City of Madison, Dane County and the Madison Metropolitan School District have collaborated on other technical issues for the past 3 years, including shared use of a secure, off-site Disaster Recovery data center and some fiber runs. MBI funding will dramatically increase the ability of these public sector entities to serve the community through shared infrastructure for Wi-Fi and fiber, multiple-use facilities and public safety initiatives and model effective public/private sector collaboration. MBI will be a model of inter-agency and public/private sector collaboration to share resources, improve public services, create jobs and drive economic growth, provide free and low-cost broadband services to vulnerable populations, and provide an open network for sustainable revenue and future enhancements.

### **Community Involvement (BTOP Applicants Only)**

#### **43. Partnering with Disadvantaged Businesses**

XIOCOM WIRELESS D/B/A Mad City Broadband (MCB) has established agreements in principle to contract with Universal Electric, which is a socially and economically



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disadvantaged small businesses (SDB) in Madison, Wisconsin, as defined by section 8(a) of the Small Business Act, 15 U.S.C. §637.

MCB hires and contracts with Universal Electric to terminate fiber on the MCB network and for commercial electrical work.

## **H. Project Budget**

### **44. General Overall Budget**



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Budget	Loan Request	Grant Request	Equity	Debt	Bond	Other
Network & Access Equipment (switching, routing, transport, access)		5,303,178				460,214
Outside Plant (cables, conduits, ducts, poles, towers, repeaters, etc.)		573,033				2,176,000
Buildings and Land – (new construction, improvements, renovations, lease)						
Customer Premise Equipment (modems, set-top boxes, inside wiring, etc.)						
Billing and Operational Support Systems (IT systems, software, etc.)		450,000				
Operating Equipment						



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(vehicles, office equipment, other)						
Engineering/ Professional Services (engineering design, project management, consulting, etc.)		1,805,350				99,200
Testing (network elements, IT system elements, user devices, test generators, lab furnishings, servers/computers, etc.)						
Site Preparation		5,055				
Other		7,903,214	1,823,586			
<b>TOTAL BROADBAND SYSTEM</b>		<b>16,039,830</b>	<b>1,823,586</b>			<b>2,735,414</b>



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**Total Budget:** \$ 20,598,830

**45. Detailed Budget:**

Please refer to upload section at the end of the document.

**Sustainability**

**46. Reasonableness**

MBI has made a significant effort to ensure that all prices and unit numbers required within this proposal are reasonable, based on industry benchmarks and services provided. This proposal has been carefully planned to maximize benefits while minimizing costs.

In the network and access area, equipment for switching, routing, and wireless access point equipment are identified for their ability to reliably provide connectivity to residential, business, and all strategic partners at 82 anchor institution facilities. Equipment has been identified to handle planned initial demand with growth capacity and ensure technical management to minimize MBI monthly expenses. Unit prices were obtained through a vendor quotation request process and prices in the response to Question 45 reflect a 40% discount off of list price.

Outside Plant, including conduit, rooftop, towers, antenna, and lateral fiber hardware kits are used at interconnection lateral points and wireless access points. Unit prices were obtained through a vendor quotation request process and prices in the response to Question 45 reflect a 40% discount off of list price. In addition, this last mile MBI project will use significant, existing resources from the City of Madison and the Madison Metropolitan School District to ensure the most cost effective and successful completion of this project. These resources include school district building rooftop use, for which the in-kind contribution reflects more than a 70% discount off local standard rental fees. In addition, these resources include City of Madison rooftop and water tower use for which the in-kind contribution reflects a rate well below the local standard rental fees.

Billing and operation support systems include Broadhop SME authentication and MCB's billing platform, Cisco Service Control Gateway, and Content Filtering Application. These systems are necessary to allow subscriber self-management of user accounts and ensure subscription fees can be kept well below standard costs as well as comply with Internet filtering requirements for



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educational institutions as defined by the 2002 Childhood Internet Protection Act. Unit prices were obtained through a vendor quotation request process and prices in the response to Question 45 reflect a 40% discount off of list price.

Regarding site surveys, network design and deployment costs, these have been pre-negotiated on a per device price model instead of per hour labor. This ensures this project will be able to control professional service costs. In addition, MBI will use existing project management resources within MCB to manage this network deployment process.

Finally, MBI partners will sign a 20 year Right To Use agreement with MCB at \$405.28 per month compared to AT&T pricing at \$5,000 per month to use the fiber network to interconnect the 82 anchor institution facilities. The fiber network is a critical part of the total infrastructure required to interconnect all 2,410 wireless access points with the backend network data center.

**47. Historical Financial Statements:**

Please refer to upload section at the end of the document.

**48. Broadband Subscriber Estimates:**

Please refer to upload section at the end of the document.

**49. Other Services:**

Please refer to upload section at the end of the document.

**50. Pro Forma 5-Year Financial Forecast and Assumptions:**

Please refer to upload section at the end of the document.

**51. Commitment of Capital Funding Support**

Party Name: Madison Metropolitan School District  
funding amount = \$177,000 [0.1% of project cost]  
Type of funding = in-kind  
Use of funding = infrastructure  
Key financing terms and conditions = N/A

Party Name: Madison Metropolitan School District  
funding amount = \$50,000 [0.0% of project cost]  
Type of funding = cash



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Use of funding = wireless LANs  
Key financing terms and conditions = N/A

Party Name: City of Madison  
funding amount = \$1,999,000 [9.7% of project cost]  
Type of funding = in-kind  
Use of funding = conduit and fiber  
Key financing terms and conditions = N/A

Party Name: Xiocom (Doing Business As MadCity Broadband)  
funding amount = \$559,414 [2.7% of project cost]  
Type of funding = in-kind  
Use of funding = design and installation  
Key financing terms and conditions = N/A

Party Name: Xiocom (Doing Business As MadCity Broadband)  
funding amount = \$1,773,586 [8.6% of project cost]  
Type of funding = cash  
Use of funding = design and installation  
Key financing terms and conditions = N/A

Total committed funding support: \$4,559,000

## BTOP Requirements

### 52. Matching Funds:

- a. Cash: \$ 1,823,586.00
- b. In-Kind: \$ 2,735,414.00
- c. Percent of Total Project Cost: 22

### 53. Demonstration of Financial Need:

For several years, technology staff members from the City of Madison, the Madison



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Metropolitan School District, Dane County, the University of Wisconsin-Madison and other organizations have had frequent joint meetings to discuss problems with broadband access, capacity and cost. Until now, projects implemented have been few in number and limited in scope due to construction and deployment costs and annual, painful struggles over steeply declining public sector budgets. For just the school district alone, budget cuts for the current year are expected to be around \$10,000,000 and this follows on a succession of several years of budget cuts, exceeding \$7,000,000 each year. The City of Madison and Dane County have similarly faced a succession of years of rigorous budget cuts.

Meanwhile, throughout the metropolitan area, poverty rates are growing while the demand for services has grown much more rapidly. For example, the percentage of Madison Metropolitan School District (MMSD) students qualifying for free/reduced lunches, a common indicator of poverty, ranges from 17% to 83% at individual schools; overall 45% of MMSD students qualify for the subsidy program (state average 34%). The free/reduced lunch rate has doubled (from approximately 22% to 45%) since the 1992-93 school year. In addition, growth in data traffic, types of traffic and the critical reliance placed on communications for effective government, education, training and economic growth have put great strain on existing technical infrastructure.

While the public sector has struggled with budget deficits, insufficient projected short-term return on investment has failed to entice the private sector to meet public sector needs, especially regarding service to underserved areas of the metropolitan area.

MBI's total project cost is \$20,598,625 with a grant funding request for \$16,039,625. This funding is not available from any other source. In the school district, IDEA and Title I funding targets desktop equipment and professional development for a subset of students and building staff. Also in the school district, zero interest bonds supporting technical infrastructure, should they become available, total \$2,515,000 but are expected to be required for power and some switch cabling upgrades [see response to Item# 42]. These funds are not available to address Last Mile technical infrastructure which is sought through this MBI proposal. Similar restrictions on City funds and the funds of other MBI partners prevent MBI from coming to fruition but for federal grant assistance.

The business case presented by Xiocom (Doing Business As MadCity Broadband) in response



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to questions 44 and 53 shows MBI would not be economically feasible without grant financing. In addition, should this project be funded, Xiocom is committed to reinvesting an average of at least 11.7% annually from future revenues to support ongoing free or reduced cost broadband for underserved populations.

**54. Unjust Enrichment**

The City of Madison has not received or applied for any Federal support for non-recurring costs in the service area for which we are seeking a BTOP award. The Madison Unified Fiber Network (MUFN) project is a complimentary proposal to the Madison Broadband Initiative (MBI) project, which is being submitted by the University of Wisconsin – Madison. However, the MUFN project has no overlapping services with the MBI project.

**55. Disclosure of Federal and/or State Funding Sources**

The City of Madison has not received or applied for any other Federal or State funding, including Universal Service Funds, which would apply to the Madison Broadband Initiative project. The Madison Broadband Initiative is an NTIA BTOP last-mile proposal.

## **I. Self Scoring – BIP Only Self Scoring**

**56. Self Scoring Sheet**



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Criteria	Method	Points	Self Scores
<b><u>PROJECT PURPOSE</u></b>			
Proportion of Rural Residents Served in Unserved Areas	1 point for every 10,000 unserved households	Up to 5	
Rural Area Targeting	1 point for every 5% increase in the rural service area up the minimum 75% rural area requirement	Up to 5	
Remote Area targeting	1 point for every 50 miles a service area is located from a non-rural area	Up to 5	
Title II Borrower	If you are or were a Title II borrower	5	
Recovery Act and other governmental collaboration	1 point will be awarded for each governmental or Recovery program the applicant is partnering with	Up to 5	
<b><u>PROJECT BENEFITS</u></b>			
Performance of the offered services	If a last mile wireline project delivers 20M to household – if a last mile wireless projects delivers 2M to end-user – if a middle mile projects delivers 100M to end points	<b>10</b>	
Affordable of services offered	Points awarded based on the proposed rate structure and the logistics of the proposed service area	Up to 5	



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Choice of service provider	If the proposed infrastructure is available to be used by multiple service providers	5	
Critical Community Facilities	If discounted rate packages at least 25% lower than advertise rates are available to critical facilities	5	
<b><u>PROJECT VIABILITY</u></b>			
Applicant's organizational capability	Points will be awarded on the strengths and accomplishments of key management	Up to 12	
Community Support	If a letter of support has been received from a designated representative of the community for every community in the proposed service territory	2	
Ability to promptly start project	If the applicant can demonstrate that all licenses and regulatory approvals have been received, contractors and vendors are ready to enter into contracts, and equity has been deposited into applicant accounts	10	
Socially and economically disadvantaged small businesses (SDB), as defined by section 8(a) of the Small Business Act, 15 U.S.C. §637.	If the applicant is a Section 8(a) entity	1	
<b><u>PROJECT BUDGET AND SUSTAINABILITY</u></b>			
Reasonableness of the budget	Points will be awarded based the	Up to 5	



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	adequacy of the proposed budget		
Leverage of outside resources (outside funding/financing requested)	(i) 10 points if this ratio is greater than 100% (ii) 7 points if this ratio is between 100% and 75% (iii) 5 points if this ratio is between 75% and 50% (iv) 3 points if this ratio is between 50% and 25% (v) 1 points if this ratio is lower than 25%	10	
Extent of grant funding (Grant funds/loan funds)	(i) 0 points if this ratio equals 100% (ii) 1 points if this ratio is between 100% and 75% (iii) 3 points if this ratio is between 75% and 50% (iv) 5 points if this ratio is lower than 50% (v) 10 points if no grant funds are requested	10	
<b>Total Points</b>		100	



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## J. BTOP Certification Requirements

### Certification (Requested for BTOP)

Please refer to upload section at the end of the document regarding following uploads.

1. U.S. Department of Commerce, Broadband Technology Opportunities Program
2. SF-424D Assurances—Construction Programs (Schedule N)
3. CD-511, Certification Regarding Lobbying (Attachment O)
4. SF-LLL, Disclosure of Lobbying Activities (Attachment P)
5. CD-512, Certification Regarding Lobbying—Lower-Tier Covered Transactions (Attachment Q) This certification will not be required until the time of the grant award, because it applies to subcontractors, etc.

## K. BIP Certification Requirements

### Certification (Requested for BIP)

Please refer to upload section at the end of the document regarding following uploads.

1. Equal Opportunity and Nondiscrimination Certification
2. Certification Regarding Architectural Barriers
3. Uniform Relocation Assistance and Real Property Acquisition - Policies Act of 1970 Certification
4. Certification Regarding Debarment, Suspension, and Other Responsibility Matters – Primary Covered Transactions
5. Certification Regarding Lobbying for Contracts, Grants, Loans, and Cooperative Agreements



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- 6. Network Design and Implementation Plan Certification (to be complete for projects requesting more than \$1 million in federal assistance)

## L. Schedules

### Schedule: A-1 Congressional Districts

**1. State the Congressional District of the Applicant’s headquarters**

Wisconsin - 2

**2. State the Congressional District for each area covered by the Project.**

Wisconsin - 2

## M. Proposed Funded Service Area Details (BIP & BTOP)

### 13. Proposed Funded Service Area (BIP - Last Mile Projects):

**Proposed Funded Service Area Name:** Mesh Service Area 1

**Census Blocks in Proposed Funded Service Area:** 5502548000480000002041000, 5502548000480000002041001, 5502548000480000002041002, 5502548000480000002041003, 5502548000480000002041004, 5502548000480000002041005, 5502548000480000002041006, 5502548000480000002041007

**Community Name:** n/a

**Rural Classification of the Community:** Non-Rural

**BIP - Service Status:**

**BIP - If Service Status is "Underserved" please select at least one applicable option from this list.**

**BTOP – Service Status:** Underserved

**BTOP - If Service Status is "Underserved" please select at least one applicable option from this list.**



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No more than 50% of the households in the proposed funded service area have access to facilities-based, terrestrial broadband service at greater than the minimum broadband transmission speed;
No fixed or mobile broadband service provider advertises broadband transmission speeds of at least 3 mbps downstream in the proposed funded service area;
The rate of broadband subscribership for the proposed funded service area is 40% of households or less.

**Total Square Miles of Community:**  
**Total Population :** 1,597  
**Total Number of Households:** 610  
**Total Number of Businesses:** 47  
**Total Number of Critical Community Facilities, Anchor Institutions and Public Safety Entities:**

**Proposed Funded Service Area Name:** Mesh Service Area 2  
**Census Blocks in Proposed Funded Service Area:** 5502525950259500005013010,  
5502525950259500005013012, 5502525950259500005031000, 5502525950259500005031001,  
5502525950259500005031002, 5502525950259500005031013, 5502525950259500005033000,  
5502525950259500005033001, 5502525950259500005033002, 5502525950259500005033003,  
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<b>Submitted Date:</b> 8/20/2009 3:10:30 PM	<b>Easygrants ID:</b> 3116
<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program	<b>Applicant Organization:</b> City of Madison
<b>Task:</b> Submit Application - Infrastructure Programs	<b>Applicant Name:</b> Mr. Richard A Beadles

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**Community Name:** n/a  
**Rural Classification of the Community:** Non-Rural  
**BIP - Service Status:**

<b>BIP - If Service Status is "Underserved" please select at least one applicable option from this list.</b>

**BTOP – Service Status:** Underserved

<b>BTOP - If Service Status is "Underserved" please select at least one applicable option from this list.</b>
No more than 50% of the households in the proposed funded service area have access to facilities-based,



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terrestrial broadband service at greater than the minimum broadband transmission speed;
No fixed or mobile broadband service provider advertises broadband transmission speeds of at least 3 mbps downstream in the proposed funded service area;
The rate of broadband subscribership for the proposed funded service area is 40% of households or less.

**Total Square Miles of Community: 13**  
**Total Population : 41,197**  
**Total Number of Households: 17,143**  
**Total Number of Businesses: 1,599**  
**Total Number of Critical Community Facilities, Anchor Institutions and Public Safety Entities:**

**Proposed Funded Service Area Name:** Mesh Service Area 3

**Census Blocks in Proposed Funded Service Area:** 5502525950259500005013010,  
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5502525950259500107011025, 5502525950259500107011026, 5502525950259500107011027, 5502525950259500107011028, 5502525950259500107011029, 5502525950259500107011030, 5502525950259500107011031, 5502525950259500107011032, 5502525950259500107011033, 5502525950259500107011034, 5502525950259500107011035, 5502525950259500107011036, 5502525950259500107011037, 5502525950259500107011038, 5502525950259500107011039, 5502525950259500107011040, 5502525950259500107011041, 5502525950259500107011042, 5502525950259500107011043, 5502525950259500107011044, 5502525950259500107011045, 5502525950259500107011046, 5502525950259500107011047, 5502525950259500107011048, 5502525950259500107011049, 5502525950259500107011050, 5502525950259500107011051, 5502525950259500107011052, 550254800048000006001000, 550254800048000006001001, 550254800048000006001002, 550254800048000006001009, 550254800048000006001010, 550254800048000006001011, 550254800048000006001012, 550254800048000006001013, 550254800048000006001014, 550254800048000006001015, 550254800048000006001016, 550254800048000006001017, 550254800048000006001018, 550254800048000006001019, 550254800048000006001027, 550254800048000006001028, 550254800048000006001029, 550254800048000006001030, 550254800048000006001031, 550254800048000006001032, 550254800048000006001033, 550254800048000006001034, 550254800048000006001035, 550254800048000006001036, 550254800048000006002008, 550254800048000006002009, 550254800048000006002010, 550254800048000006002011, 550254800048000006002013, 550254800048000006003002, 550254800048000006003003, 550254800048000006003004, 550254800048000006003006, 550254800048000006003007, 5502548000480000014021011, 5502548000480000014021048, 5502548000480000014021050, 5502548000480000014022000, 5502548000480000014022003, 5502548000480000014022004, 5502548000480000014022005, 5502548000480000014022007, 5502548000480000014022008, 5502548000480000014022009, 5502548000480000014022010, 5502548000480000014022011, 5502548000480000014022012, 5502548000480000014022013, 5502548000480000014022014, 5502548000480000014023001, 5502548000480000014023002, 5502548000480000014023003, 5502548000480000014023013, 5502548000480000014023014, 5502548000480000014023015, 5502548000480000014023019, 5502548000480000014023020, 5502548000480000014023021, 5502548000480000014023022, 5502548000480000014024000, 5502548000480000014024001, 5502548000480000014024002, 5502548000480000014024003, 5502548000480000014024004, 5502548000480000014024005, 5502548000480000014024006, 5502548000480000014031000, 5502548000480000014031002, 5502548000480000014031003, 5502548000480000014031004, 5502548000480000014031005, 5502548000480000014031006, 5502548000480000014031007, 5502548000480000014031008, 5502548000480000014031009, 5502548000480000014031010, 5502548000480000014031013,



**Broadband Infrastructure Application  
Submission to RUS (BIP) and NTIA (BTOP)**

<b>Submitted Date:</b> 8/20/2009 3:10:30 PM	<b>Easygrants ID:</b> 3116
<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program	<b>Applicant Organization:</b> City of Madison
<b>Task:</b> Submit Application - Infrastructure Programs	<b>Applicant Name:</b> Mr. Richard A Beadles

5502548000480000014031014, 5502548000480000014031015, 5502548000480000014031016, 5502548000480000014031017, 5502548000480000015021004, 5502548000480000015021006, 5502548000480000015021007, 5502548025999990014021009, 5502548025999990014021010, 5502548025999990014021046, 5502548025999990014021047, 5502548025999990014021049, 5502548025999990014021051, 5502548025999990014021052, 5502548025999990014022001, 5502548025999990014022002, 5502548025999990014022006, 5502548025999990014023000, 5502548025999990014023004, 5502548025999990014023005, 5502548025999990014023010, 5502548025999990014024007, 5502548025999990014024008, 5502548025999990014024009, 5502548025999990014024010, 5502548025999990014024011, 5502548025999990014024012, 5502548025999990014024013, 5502548025999990014031001, 5502548025999990014031012, 5502548025999990015021000, 5502548025999990015021001, 5502508350999990015022001, 5502508350999990015022002, 5502508350999990015022051, 5502508350999990015022053, 5502508350999990015022054, 5502508350999990015022056, 5502508350999990015022057, 5502508350999990015022058, 5502525950259500015023033, 5502525950259500015023038, 5502525950259500015023039, 5502525950259500015023040, 5502548000480000014011013, 5502548000480000015011000, 5502548000480000015011001, 5502548000480000015011002, 5502548000480000015011003, 5502548000480000015011004, 5502548000480000015011005, 5502548000480000015022000, 5502548000480000015022019, 5502548000480000015022020, 5502548000480000015022022, 5502548000480000015022023, 5502548000480000015022024, 5502548000480000015022029, 5502548000480000015022030, 5502548000480000015022031, 5502548000480000015022037, 5502548000480000015022038, 5502548000480000015022039, 5502548000480000015022040, 5502548000480000015022041, 5502548000480000015022042, 5502548000480000015022043, 5502548000480000015022044, 5502548000480000015022045, 5502548000480000015022046, 5502548000480000015022049, 550254800048

**Community Name:** n/a  
**Rural Classification of the Community:** Non-Rural  
**BIP - Service Status:**

<b>BIP - If Service Status is "Underserved" please select at least one applicable option from this list.</b>
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**BTOP – Service Status:** Underserved

<b>BTOP - If Service Status is "Underserved" please select at least one applicable option from this list.</b>
No more than 50% of the households in the proposed funded service area have access to facilities-based, terrestrial broadband service at greater than the minimum broadband transmission speed;



**Broadband Infrastructure Application  
Submission to RUS (BIP) and NTIA (BTOP)**

<b>Submitted Date:</b> 8/20/2009 3:10:30 PM	<b>Easygrants ID:</b> 3116
<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program	<b>Applicant Organization:</b> City of Madison
<b>Task:</b> Submit Application - Infrastructure Programs	<b>Applicant Name:</b> Mr. Richard A Beadles

No fixed or mobile broadband service provider advertises broadband transmission speeds of at least 3 mbps downstream in the proposed funded service area;
The rate of broadband subscribership for the proposed funded service area is 40% of households or less.

**Total Square Miles of Community: 11**  
**Total Population : 21,892**  
**Total Number of Households: 8,726**  
**Total Number of Businesses: 1,530**  
**Total Number of Critical Community Facilities, Anchor Institutions and Public Safety Entities:**

**Proposed Funded Service Area Name:** Mesh Service Area 4

**Census Blocks in Proposed Funded Service Area:** 5502508350999990020001001,  
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**Broadband Infrastructure Application  
Submission to RUS (BIP) and NTIA (BTOP)**

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<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program		<b>Applicant Organization:</b> City of Madison	
<b>Task:</b> Submit Application - Infrastructure Programs		<b>Applicant Name:</b> Mr. Richard A Beadles	

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<b>Task:</b> Submit Application - Infrastructure Programs	<b>Applicant Name:</b> Mr. Richard A Beadles

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**Community Name:** n/a  
**Rural Classification of the Community:** Non-Rural  
**BIP - Service Status:**



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<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program	<b>Applicant Organization:</b> City of Madison
<b>Task:</b> Submit Application - Infrastructure Programs	<b>Applicant Name:</b> Mr. Richard A Beadles

**BIP - If Service Status is "Underserved" please select at least one applicable option from this list.**

--

**BTOP – Service Status:** Underserved

**BTOP - If Service Status is "Underserved" please select at least one applicable option from this list.**

No more than 50% of the households in the proposed funded service area have access to facilities-based, terrestrial broadband service at greater than the minimum broadband transmission speed;
No fixed or mobile broadband service provider advertises broadband transmission speeds of at least 3 mbps downstream in the proposed funded service area;
The rate of broadband subscribership for the proposed funded service area is 40% of households or less.

**Total Square Miles of Community: 4**  
**Total Population : 19,178**  
**Total Number of Households: 8,649**  
**Total Number of Businesses: 527**  
**Total Number of Critical Community Facilities, Anchor Institutions and Public Safety Entities:**

**14. Proposed Service Area (BTOP - Middle Mile Project):**

**Middle Mile Span Name:**  
**Census Blocks in Middle Mile Span:**  
**Last Mile Service Area Name:**  
**Community Name:**  
**Rural Classification of the Community:**  
**BIP – Service Status:**

**BIP - If Service Status is "Underserved" please select at least one applicable option from this list.**

--

**BTOP - Service Status:**



**Broadband Infrastructure Application  
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**BTOP - If Service Status is "Underserved" please select at least one applicable option from this list.**

**Total Square Miles of Service Area:**

**Total Population :**

**Total Number of Households:**

**Total Number of Businesses:**

**Total Number of Critical Community Facilities, Anchor Institutions and Public Safety Entities:**

## N. Uploads

In order to improve system performance and help ensure that all applicants are able to complete their applications by the deadline, we have changed the way your application PDF is created. This PDF contains all of the information you entered throughout the Easygrants data entry screens. PDF copies of all documents that have been uploaded can be viewed and printed separately from the **Main page of the application after you submit**. These will continue to be available to you in read-only format after your application has been submitted.