



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

<b>Submitted Date:</b> 8/20/2009 4:54:51 PM	<b>Easygrants ID:</b> 3576
<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program	<b>Applicant Organization:</b> The Board of Regents of the University of Wisconsin System
<b>Task:</b> Submit Application - Infrastructure Programs	<b>Applicant Name:</b> Mr. Patrick Lee Christian

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## Table of Contents

- A. General Application Information
- B. Eligibility Factors
- C. Executive Summary
- D. Proposed Funded Service
- E. Proposed Service Offering
- F. Technology Strategy
- G. Project Milestones Completion Factors
- H. Project Budget
- I. Self Scoring
- J. BTOP Certification Requirements
- K. BIP Certification Requirements
- L. Schedules
- M. BIP – BTOP Service Area Details
- N. Uploads



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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>	The Board of Regents of the University of Wisconsin System
<b>ii. Employer/Taxpayer Identification Number (EIN/TIN):</b>	396006492
<b>Street 1:</b>	21 N. Park Street, Suite 6401
<b>Street 2:</b>	
<b>City:</b>	Madison
<b>County:</b>	Dane
<b>State:</b>	WI
<b>Country</b>	United States
<b>Zip/Postal Code:</b>	53715-1218

#### 1-B. Name and Contact Information of Person to be Contacted on Matters Involving this Application:

<b>Prefix:</b>	Mr.
<b>First Name:</b>	Patrick
<b>Middle Name:</b>	Lee
<b>Last Name:</b>	Christian
<b>Suffix:</b>	
<b>Telephone Number:</b>	608-265-9699
<b>Fax Number:</b>	608-262-4679
<b>Email:</b>	patrick.christian@doit.wisc.edu
<b>Title:</b>	Assistant Director, WAN Services



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<b>1-C. Other Required Identification Numbers</b>	
<b>i. Organizational DUNS:</b>	161202122
<b>ii. CCR # (CAGE):</b>	09FZ2
<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). **State or State Agency**

**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:** Metropolitan Unified Fiber Network (MUFN)

**2-B. Project Description:** MUFN is a collaborative metro fiber-optic network serving education, health, government & NPO anchor institutions in the Madison, Middleton and Monona, WI area. It unifies & augments existing telecom resources to facilitate enhanced Internet, p2p connectivity & application sharing. This effort improves broadband access, economic development, public safety, education & community support programs.



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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.

**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: **Middle 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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complete by the end of the 3rd year from the award date.
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.
The Applicant provides two-way data transmission with advertised speeds of at least 768 kbps downstream and 200 kbps upstream.
Applicant understands and agrees to comply with the nondiscrimination and interconnection obligations outlined in the NOFA.

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



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- **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

Technology staff from the University of WI-Madison (UW), the City of Madison, the Madison Metropolitan School District, Dane County and others, have met for several years to discuss problems with broadband access, capacity and affordability. The desire to collaborate on fiber paths to connect institutions, provide access to at-risk populations of the greater metropolitan area, meet the rapidly changing needs of public safety and more affordably serve public schools and libraries has been at the core of these discussions. Until now, projects implemented have been few in number and limited in scope due to construction and deployment costs and annual, painful struggles over 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 poorer areas of the metropolitan area hosting under-served populations.

The Metropolitan Unified Fiber Network (MUFN), an NTIA BTOP, middle mile proposal: enables last mile broadband deployment to underserved areas by entities such as Xicom d/b/a Mad City Broadband (See Madison Broadband Initiative: MBI last mile proposal); provides anchor institutions with affordable, scalable broadband to address rapidly increasing data transport requirements for delivery of education, health care, public services, safety, library and economic growth; supports critical public safety initiatives including expanded use of remote surveillance equipment and sensor monitoring to improve water quality, fire and police protection; enhances crisis communication and remote training opportunities for county local public health departments and physicians with the WI State Laboratory of Hygiene; develops



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underlying infrastructure for implementation of electronic health record, low-income and emergency health response service projects by a consortium of the University of Wisconsin (UW) School of Medicine and Public Health, UW Hospital and Clinics, UW Medical Foundation and Meriter Hospital; facilitates job creation via broadband to business incubators and job training facilities; connects dozens of community organizations serving vulnerable populations to enhance service offerings, reduce duplication of non-core activities and improve service quality; and demonstrates effective public/private collaboration of government, education, library and health care institutions with a private sector local ISP and integrator

If funded, this middle mile project increases educational opportunities, creates jobs, improves public safety and stimulates use of the Internet and new technologies.

The MUFN project identifies six proposed funded service areas that specifically cover a 22 square mile area serving approximately 4985 businesses, over 106,000 people in more than 47,000 households, a quarter of which reside in underserved areas. The service areas include the cities of Madison, Middleton, Monona and Fitchburg, townships of Madison, Burke, Blooming Grove and Middleton and the Village of Shorewood Hills. These six service areas include two city blocks adjacent to arterial streets where proposed middle mile facilities will be located and expanded coverage areas of three city blocks adjacent to where last mile provider Mad City Broadband seeks to install wireless access points.

MUFN has been crafted through a collaborative effort that includes: 3 hospitals (Meriter Hospital, University of WI Hospital and Clinics, American Family Children's Hospital), a private medical foundation (University of WI Medical Foundation), 2 municipal governments (City of Madison and City of Middleton), 3 school districts (Madison Metropolitan, Monona Grove and Middleton-Cross Plains), as well as Dane County, the South Central Library System, a public university (UW), a community college (Madison Area Technical College), over two dozen community support organizations aggregated together in 9 locations by an organization called DaneNet, and other participants such as the WI State Lab of Hygiene and the University of WI Extension Geological and Natural History Survey. We have also collaborated with Mad City Broadband to ensure our proposed middle mile infrastructure can serve a collaborative last mile project.

MUFN will serve 100 locations associated with the aforementioned institutions and provide



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middle mile services for Mad City Broadband who will also serve 99 anchor institutions. Together, MUFN and Mad City Broadband will cover approximately 90% of all community anchor institutions, public safety entities and critical community organizations in the greater metropolitan area.

The MUFN project will provide a dramatic long-term, cost-effective improvement of affordable middle mile broadband facilities for last mile providers and service for critical community facilities, anchor institutions and public safety entities. MUFN delivers on this claim by offering dark fiber connections and passive dense wave division multiplexing (DWDM) wavelength services on portions of the network (specifically service areas depicted in question 12 called Northport Area and Monona Drive with map IDs of 4 and 5 respectively). Participants will be able to connect to various ISPs at minimum 100Mbps or more likely 1Gbps or as needed 10Gbps Ethernet speeds given hardware availability and cost factors. With fiber and DWDM wavelength services, we foresee MUFN facilities being able to almost infinitely scale up for the expected 25 year life cycle of the fiber. Individual institutions and other service providers at interconnect locations will be able to make their own choices in regards to speed based on their selection of edge or customer premise equipment that fits their needs and budget. We note several ISPs are prepared for such connections at affordable rates and that future needs may require investment in additional low-cost, passive DWDM multiplexing devices in order to scale the high-count fiber cables we seek to install. These transport services would be offered in two tiers of service with one for commercial entities and another for not-for-profit entities.

MUFN views the power of this basic service offering as infrastructure that will enable smaller groups to develop their own applications specific to their needs. Specific applications by subgroups include video for public safety entities and distance education, ambulance communication with emergency rooms to transmit patient vital signs before they arrive, electronic health record access, and expensive instrument or other resource sharing such as UW-Madison sharing its scanning electron microscope with Madison Area Technical College students.

Interconnect and non-discrimination policies will permit service providers to interconnect with the MUFN network at anchor institution locations as well as various handhole and splice point locations along the route such that there are at least 100 locations where interconnection is





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available on a long-term basis. These connections will have best-effort, full line rate, non-discriminated use of fiber or wavelength services without application, content prioritization or capacity limits. The fiber or wavelength services will be able to connect to at least 10 Internet Service Providers providing countless applications and services at either of two locations in the MUFN service area via UW operated Madison Internet Exchange (MadIX) facilities or through direct connectivity to an end-user's provider of choice. MUFN will prominently display non-discrimination, network management and interconnect policies on an organization website and provide notice of policy changes to system users. We note Mad City Broadband has agreed to use MUFN middle mile facilities if funded for their last mile commercial business activities.

The MUFN project will install a fiber-optic cable wireline broadband system in six service areas. In two proposed funded service areas, our design proposes using passive dense wave division multiplexing (DWDM) filters with standard, International Telecommunications Union (ITU) grid frequencies to provide redundancy. We offer point-to-point services with ability to connect from any proposed funded service area to another proposed funded service area. Ethernet (1Gbps/10Gbps) will be used at aggregation node locations with end-users providing their own network edge or customer premise equipment at their locations. Overall cost of the MUFN broadband system is \$10.4 million with cash and in-kind contributions of conduit and fiber totaling \$3.75 million. MUFN requests an NTIA BTOP grant of approximately \$6.65 million.

MUFN will be implemented and operated by the UW in collaboration with the City of Madison Traffic Engineering Department. The city brings over 20 years of conduit and fiber construction knowledge as well as fiber restoration, permitting and planning expertise. UW has experience, systems, tools, processes and personnel knowledgeable in deploying and operating fiber networks for over 20 years including: a large campus network of over 275 buildings, 75 miles of metropolitan fiber networks in 5 cities and over 2600 miles of fiber in 6 states. These networks are lit with a variety of baseband and wave division multiplexing technologies. In addition, UW has operated a NSF grant funded statewide education and research network since 1990 called WiscNet, which provides commodity Internet and academic research network connectivity to over 450 education, government and hospital entities in Wisconsin and for the University of Iowa, University of Minnesota and Iowa State University.

MUFN, combined with last mile provider Mad City Broadband expects to serve approximately



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6800 households, 461 businesses and almost 200 anchor institution, critical community organizations and public safety entity locations within 2 years of grant funding. Based on our calculations, we estimate the MUFN project will create or save 516 jobs.

**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.
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:**

Anchor institutions in the greater Madison metropolitan area have been struggling with access to affordable and scalable broadband needs for many years. Beginning in 2006, after sale of a commercial carrier, the City of Madison and several healthcare providers began losing rights to fiber they had used since 1997. Instead, anchor institutions were offered cost-prohibitive circuits to replace fiber access. This resulted in reduced productivity for healthcare providers using patient record management software. Lack of affordable broadband is one of the main barriers standing in the way of Madison businesses vying to host large-scale events. For example, the Monona Terrace convention center was recently a finalist to host a Vice-Presidential debate. However, the convention center lost its bid due to a lack of affordable broadband at the facility for media. In 2009, after an exhaustive request for proposals (RFPs) by a local hospital for high-capacity commercial circuits between the hospital and a new data



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center, the hospital determined that it was more cost effective to fund a new fiber build themselves rather than lease commercial service. Unlike the hospital in our example, many community anchor institutions simply cannot afford to fund fiber builds so those they serve, such as school children and library users, go with limited or no access. Given these and other events over the past few years, anchor institutions and interested commercial entities have been meeting to discuss opportunities to enhance broadband services and affordability in the greater Madison metropolitan area.

The Metropolitan Unified Fiber Network (MUFN) project, a NTIA BTOP middle-mile proposal, will enable anchor institutions to obtain long-term, scalable network connectivity, control broadband costs, retain governance over telecommunications facilities and facilitate sharing resources and services among institutions. This project will also support critical public safety initiatives including expansion in use of remote surveillance equipment and greater data transport for fire, police and emergency health response services. Additionally, MUFN will support key initiatives for under-served populations including enabling implementation of an important “last mile” project to provide high speed broadband access to community centers and free or reduced cost wireless service to vulnerable neighborhoods. (See BTOP Madison Broadband Initiative: MBI proposal.) This project will also provide opportunities for commercial entities, such as Mad City Broadband, to obtain middle-mile access supporting their proposed expansion of last-mile services for public safety, business and residential broadband customers and provide revenue to ensure the sustainability of these important community services. If funded, this middle mile project increases educational opportunities, creates jobs, improves public safety and stimulates use of the Internet and new technologies in a collaborative public/private sector model.

MUFN project participants include 3 hospitals (Meriter Hospital and the University of Wisconsin Hospital and Clinics, American Family Children’s Hospital), 2 municipal governments, 3 school districts (Madison Metropolitan, Monona Grove and Middleton-Cross Plains, which collectively serve over 34,000 students), as well as Dane County, the South Central Library System (serving libraries in 7 counties), a major university (the University of Wisconsin-Madison), the Madison Area Technical College (which serves 12 counties) and many community support organizations and other participants (including the State Lab of Hygiene and the University of Wisconsin Extension Geological and Natural History Survey). Collectively, we, the MUFN project participants, assert that MUFN meets four BTOP statutory



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purposes.

\* Provide broadband to underserved areas of the U.S.

MUFN will have interconnection points at anchor institution facilities in several locations throughout the proposed service area. 15 interconnection points reside in census blocks with less than 40% subscription rates to existing broadband service. From these interconnection points, access to over 10 Internet Service Providers is possible. If funded, one commercial entity has, so far, committed to using significant portions of MUFN fiber to provide last mile services.

\* Provide broadband education, awareness, training, access, equipment and support

The MUFN project will provide broadband access via dark fiber and/or lit service as well as corresponding operations, administration, maintenance and provisioning at 1Gbps and 10Gbps to schools, libraries, medical/healthcare facilities, community colleges, higher education locations and community support organizations. Network design engineers from UW-Madison will be available at no fee to assist institutions in designing their network and understanding the technologies involved. Several institutions including Madison Area Technical College (MATC) and South Central Library System (SCLS) currently provide training to new computer users while the Madison School District is developing such community programming.

\* Improve access to, and use of, broadband service by public safety agencies

A consortium of law enforcement groups from the university, the City of Madison, Dane County and a local FBI office received a grant to develop joint resources for cyber forensics and computer crime. The group sought to use UW-Madison's large storage network to warehouse forensic data for evidence at trials but was unable to due to the lack of affordable broadband between the parties involved. Via proposed MUFN connectivity to the entities involved, this project can achieve its full potential. Additionally, to combat serious crime in the downtown area, the Madison Police Department has collaborated with a commercial entity to install cameras and increase data transport capacity to enhance surveillance capabilities. The MUFN project provides transport for the camera images to various agencies and will permit the expansion of this public safety camera system across the city.

\* Stimulate the demand for broadband, economic growth, and job creation

UW-Madison is the #2 research university in the country receiving over \$900 million dollars



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annually from federal sources including NSF and NIH. The university has a track record of commercializing its research and turning those efforts into startup businesses in the greater metropolitan area. Several startups are located in university research park incubator facilities and require affordable, high-speed bandwidth to develop next generation technologies and jobs. In addition to UW-Madison, MATC is affiliated with a technology incubator which provides technical support and network connectivity. MUFN's proposal includes connectivity to these anchor institutions to facilitate business development, job creation and broadband demand.

This MUFN proposal requests \$6.65 million to build 12.25 miles of new conduit in pre-approved City of Madison and Wisconsin Department of Transportation right-of-way, 100 laterals to anchor institution locations, and installation of a high-count fiber cable in approximately 34 miles of new and existing (in-kind contribution) conduit. This infrastructure will augment existing fiber resources obtained from the WI Dept. of Transportation or installed as part of a Department of Homeland Security grant. Experienced personnel using existing systems at the UW-Madison will perform operations, administration and provisioning activities while fiber maintenance activities will be performed by qualified and skilled staff at the City of Madison.

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

The Metropolitan Unified Fiber Network (MUFN) will enhance broadband service for health care delivery, education and children as contemplated by the Recovery Act. This initiative will address these needs in the following ways:

**Health care:**

\* Implementation of electronic health records, telemedicine and enabling high bandwidth medical research are benefits expected by the consortium of the University of Wisconsin (UW) School of Medicine and Public Health, UW Hospital and Clinics, American Family Children's Hospital, UW Medical Foundation and Meriter Hospital.

\* From enhanced crisis communication for county local public health departments and physicians to remote training and the contingency of enabling continuity of operations through a high level of telecommuting during the instance of an influenza pandemic, the Wisconsin Laboratory of Hygiene, the state's public health laboratory, would be able to provide better and more comprehensive service to the citizens of Wisconsin.



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Education:

- \* Higher bandwidth to enable streaming media and remote research applications are among the new functionalities that the Madison, Middleton and Monona Grove school districts will realize
- \* Integration to enable the full higher education technological environment for the off campus locations of the University of Wisconsin and Madison Area Technical College.
- \* Ability to increase service capacity and data traffic loads for cooperating libraries in the metropolitan and statewide area will be possible for the South Central Library System.
- \* Improved ability of distribute and collect data, in particular the addition of interactive geographic information system maps are enhancements the Wisconsin Geological and Natural History Survey expect to make available to its community.
- \* Ability for the Wisconsin State Laboratory of Hygiene to provide lecture and demonstration portions of the laboratory technician training program at Madison Area Technical College to other technical colleges throughout the state.

Children:

- \* Improve instruction, outreach and administration in city schools with redundant high bandwidth connections in conjunction with the Madison Broadband Initiative “Last Mile” proposal. This will enable the vision of lighted schoolhouses to serve broadband not only to children, but families and the community beyond the normal school day
- \* Enhance online access to resources for families using community centers, Not-For-Profit agencies targeting vulnerable populations (in conjunction with the Madison Broadband Initiative “Last Mile” proposal).
- \* Ensure a secure environment by enhanced, integrated connections for police, fire and other public safety agencies.

This middle mile project is a key to establishing a robust scalable network infrastructure upon which the community can build and expand into the future. Health care, education and services for children will immediately benefit from the initiative.



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## D. Proposed Funded Service Area

### 12. Proposed Funded Service Area Maps:

12-A. Service Area Map (Reference Number): **4B64-E1D0-47E1-A5AA**

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):

### 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:

The City of Madison's Neighborhood Indicators Project played a critical role in identifying the target neighborhoods to be served by this grant proposal. Neighborhood Indicators is a compilation of key data that is both timely and at the right geography to let us know what Madison, Middleton and Monona neighborhoods are like and how they're doing.

As identified by the Pew Research Center in its findings presented to the National Broadband Strategy Symposium, income level remains one of the largest indicators of broadband subscription. Accordingly, several fields in Neighborhood Indicators relating to family income and presence of children, businesses and public facilities were reviewed separately and in combination to identify target areas for this middle mile broadband project. Data is summarized by Census Block Groups and City of Madison planning districts that are largely governed by Census Bureau geographies.

Families with children



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<b>Task:</b> Submit Application - Infrastructure Programs		<b>Applicant Name:</b> Mr. Patrick Lee Christian	

The source of this data is Claritas, which provides up-to-date demographic estimates based on 2000 Census data and brought to currency by various formulas and assumptions. This represents the estimated percentage of all households that are families with children. Estimates are for 2008.

**Participation in income-qualified assistance programs**

The source of this data is the Dane County Department of Human Services based on the Wisconsin Department of Children and Families (formerly Health and Family Services) CARES database extract. It identifies the number of families with one or more minor children who received Medical Assistance, Food Stamps and/or W-2 (welfare-to-work) benefits in September 2007. This data source indicates the concentration of families in financial need.

**Free and reduced lunch**

The source of this data is the Madison Metropolitan School District (MMSD) based on the Third Friday of September 2007 Counts. It represents the percent of MMSD students receiving free or reduced cost lunch. It is limited to students who participate in school lunch program, which is governed by the USDA Free & Reduced Lunch Program regulations. This data source is our most up-to-date estimate on family income levels and represents families in need.

In addition to these fields from the Neighborhood Indicators Project, data points were analyzed to determine the potential for connecting public facilities and disadvantaged businesses to the Internet.

Disadvantaged businesses. The source of this data is the Wisconsin Uniform Certified Program (UCP) directory of disadvantaged businesses that includes companies that meet the criteria established by the Small Business Administration (SBA) 8a program. It identifies the disadvantaged businesses that would be connected with free or reduced rate wireless Internet access.

**Combined overlay**

To better identify target areas, the fields of families with children, income qualified assistance, and free and reduced lunch were combined. The overlay is based on the top quartile of each field. For example, if an area ranks in the top 25% of families with children, then it receives a value of 1. This is done for each field and area and the numbers added together. This was then





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

<b>Submitted Date:</b> 8/20/2009 4:54:51 PM		<b>Easygrants ID:</b> 3576	
<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program		<b>Applicant Organization:</b> The Board of Regents of the University of Wisconsin System	
<b>Task:</b> Submit Application - Infrastructure Programs		<b>Applicant Name:</b> Mr. Patrick Lee Christian	

used to build a simple intensity map for values zero to three with data points added to identify facilities and disadvantaged businesses that would be connected to wireless Internet access by the fiber ring.

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

### **18. Middle Mile Benefits**

The Metropolitan Unified Fiber Network (MUFN) is a public/private project that seeks to improve broadband service for residential, business and anchor institutions via funding in six proposed middle mile service areas.

The service areas are a conservative representation of Xiocom d/b/a Mad City Broadband (MCB)'s wireless network expansion across the three municipality area (See NTIA BTOP last mile proposal Madison Broadband Initiative (MBI)). MCB reports their hardware provides service in a ½ mile radius from each access point which we've represented as coverage of 2-3 blocks in each direction. The service areas depicted also include 100 planned (committed) direct connections for 16 participating community anchor institutions and public safety entities that are physically located up to 2 blocks away from existing or proposed MUFN conduit and fiber paths.

MCB is a commercial wholesale and retail wireless network provider who currently provides Internet and other value-add services in portions of the metropolitan area. It has existing wholesale arrangements with Merrimac Communications, iPASS and Boingo to provide retail services on MCB's current and planned expansion wireless network and are open to, following non-discrimination and interconnection principles, other such arrangements with additional providers. MCB and its partner ISPs have committed to use the MUFN middle mile infrastructure to backhaul its last mile wireless network to aggregation nodes in downtown Madison.

Over 106,000 residents (25,000 in underserved areas) and almost 5000 businesses will benefit from the last mile portion of this project, if funded, by gaining access to at least 3Mb of broadband service within most of the metropolitan area at competitive rates. Based on existing market subscriptions, expected residential subscription to this broadband offering is over 6800 households, 461 businesses and 200 anchor institutions within 2 years of grant funding.



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

<b>Submitted Date:</b> 8/20/2009 4:54:51 PM	<b>Easygrants ID:</b> 3576
<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program	<b>Applicant Organization:</b> The Board of Regents of the University of Wisconsin System
<b>Task:</b> Submit Application - Infrastructure Programs	<b>Applicant Name:</b> Mr. Patrick Lee Christian

Irregardless of whether the last mile MBI project is funded, there is significant value in funding the MUFN project in support of anchor institutions and to enable expansion of residential and commercial broadband services.

The MUFN project will provide a dramatic long-term, cost-effective improvement of broadband service for critical community facilities, anchor institutions and public safety entities by offering dark fiber connections and passive dense wave division multiplexing (DWDM) wavelength services on portions of the network (specifically service areas Northport Area and Monona Drive with service labels of 4 and 5). Participants will be able to connect to various ISPs at minimum gigabit Ethernet speeds given hardware availability and cost factors. With fiber and DWDM wavelength services, we foresee MUFN facilities being able to almost infinitely scale up for the expected 25 year life cycle of the fiber. Individual institutions and other service providers at interconnect locations will be able to make their own choices in regards to speed based on their selection of edge or customer premise equipment that fits their needs and budget. We note several providers are prepared for such connections at affordable rates and that future needs may require investment in additional low-cost, passive DWDM multiplexing devices in order to scale the high-count fiber cables we seek to install.

MUFN interconnect and non-discrimination planned policies will permit service providers to interconnect with the network at anchor institution locations as well as various handhole and splice point locations along the route such that there are at least 100 locations where interconnection is available on a long-term basis with approximately 20% of these points residing in underserved areas.

We find insufficient competition (see question 21/attachment C response) resulting in higher prices and (over 25%) underserved end users – particularly in economically challenged areas. MUFN’s approach is to make dark fiber and wavelengths available to critical community facilities, community anchor institutions and public safety entities at a fraction of the cost of existing circuit offerings by commercial entities tails). The MUFN project will address these issues by providing service provider choice, long-term scalable network speed and capacity.

Committed MUFN project participants include and will directly serve the following community anchor institutions and public safety groups:



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

<b>Submitted Date:</b> 8/20/2009 4:54:51 PM	<b>Easygrants ID:</b> 3576
<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program	<b>Applicant Organization:</b> The Board of Regents of the University of Wisconsin System
<b>Task:</b> Submit Application - Infrastructure Programs	<b>Applicant Name:</b> Mr. Patrick Lee Christian

\* 3 hospitals and 15 clinics

- Serving: 2.25 million people based on 2008 in/out/emergency admissions/clinic visits
- Benefits: improved access to medical records and electronic files, ambulance to emergency room communications

\* 2 city governments and 22 critical community facilities

- Serving: 200,000 people (Madison) and 16,000 people (Middleton) (2008 US census estimates)
- Benefits: connect first responder facilities fire departments, police stations, low-income health service facilities, water utility pump locations and housing service departments and facilities to expand public health programs, improve drinking water quality and facilitate first responder and transportation information gathering and dissemination capabilities via installation of cameras in various locations across the city

• 3 School Districts

- Serving: 34,000 students (2008 enrollment data)
- Benefits: enhancing broadband service to 18 buildings for virtual field trips, improved teacher/parent interaction, access to web-based courses for gifted and talented learners

• Dane County

- Serving: 482,000 people (U.S. 2008 census population estimates)
- Benefits: enhancing broadband to 16 locations to improve first responder information, human services programs (including low-income health centers) and job centers capacity for using web-based assessment and application programs

• South Central Library System

- Serving 50 community libraries in 7 counties (786,000 per 2006 U.S. Census estimates)
- Benefits: improved broadband for 1.2 million computer users and shared administrative systems (e.g. card catalogues) and new methods of providing technical support to end-users

• University of Wisconsin - Madison

- Serving: 42,000 students and 2200 faculty (2008 admissions/employment data)
- Benefits: connect 7 off-campus facilities to the Internet in order to improve public health



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

<b>Submitted Date:</b> 8/20/2009 4:54:51 PM	<b>Easygrants ID:</b> 3576
<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program	<b>Applicant Organization:</b> The Board of Regents of the University of Wisconsin System
<b>Task:</b> Submit Application - Infrastructure Programs	<b>Applicant Name:</b> Mr. Patrick Lee Christian

research and education activities, provide continuing education to current medical practitioners as well as enhance long-term job creation through connectivity of business incubator facilities

- Madison Area Technical College
  - Serving: 44,000 students in 12 counties (2008 enrollment data)
  - Benefits: connect 3 locations to expand access to courses through videoconferencing, share instruments (e.g. electron microscope) with UW to enhance instruction and provide more Internet bandwidth to incubator facilities in support of improving job creation
  
- State Lab of Hygiene
  - Serving: 5.6 million people (WI 2008 U.S. Census population estimates)
  - Benefits: connect 3 locations to improve public access to H1N1 flu and other data, technical expert videoconferences with local public health providers, remote instruction, Internet capacity to handle demands during pandemics, biological/human-induced events
  
- Wisconsin Geological and Natural History Survey
  - Serving: 5.6 million people (WI 2008 U.S. Census population estimates)
  - Benefits: improve real-time access to maps and data used by GIS systems across the State, providing large natural resource, land-use and environmental management data repositories and reports online
  
- DaneNet
  - Serving: hundreds of organizations who serve vulnerable populations in Dane County (population 482,000 based on 2008 U.S. Census)
  - Benefits: connect over 28 community service organizations and business incubators in 9 buildings to the Internet to more efficiently provide programming for children, senior citizens and low-income health care.

## **E. Proposed Service Offering**

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

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



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

<b>Submitted Date:</b> 8/20/2009 4:54:51 PM	<b>Easygrants ID:</b> 3576
<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program	<b>Applicant Organization:</b> The Board of Regents of the University of Wisconsin System
<b>Task:</b> Submit Application - Infrastructure Programs	<b>Applicant Name:</b> Mr. Patrick Lee Christian

**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**

**22. Description of Network Openness:**

The MUFN project will offer wireline services via fiber optic strands consistent w/ the NTIA BTOP NOFA non-discrimination & network interconnection obligations. We support ubiquitous and pervasive network access that is open and affordable using open, standard protocols. MUFN 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). Rather, we offer services on a best effort basis with all services subject to the legal needs of law enforcement.

System users, at their full expense, will be permitted to connect their choice of hardware to dark fiber strands, provided such hardware does not adversely affect the use by and/or electronic or optronic equipment of other system users. MUFN project facilities will enable system users to connect to at least 10 Internet Service Providers providing countless applications and services at either of two locations in the MUFN service area. MUFN will prominently display non-discrimination, network management and interconnect policies on an organization website and provide notice of policy changes to system users.

UW-Madison operates a local, settlement-free peering exchange called MadIX (Madison Internet Exchange) at the same two locations identified as Internet connection points above. Service providers are invited to interconnect at layer 2 with 1 or 10Gbps Ethernet to both UW-Madison and to each other to improve community Internet service. Fourteen networks currently participate in this data exchange. As part of the MUFN project, UW will extend that invitation to MUFN system users such that a commercial entity could connect to MadIX to exchange



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

<b>Submitted Date:</b> 8/20/2009 4:54:51 PM	<b>Easygrants ID:</b> 3576
<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program	<b>Applicant Organization:</b> The Board of Regents of the University of Wisconsin System
<b>Task:</b> Submit Application - Infrastructure Programs	<b>Applicant Name:</b> Mr. Patrick Lee Christian

traffic with other providers and provide service to MUFN system users. System users can also directly interconnect to service providers at their own expense and effort.

MUFN commits to providing wholesale access to network components (e.g. dark fiber) via a City of Madison agreement with Xicom d/b/a Mad City Broadband (MCB). MCB will negotiate business arrangements, capacity limits, reasonable financial terms, and technical conditions for interconnect with requesting parties. We agree to submit to binding arbitration if such negotiations were to reach an impasse.

Other MUFN system interconnection and network management practices include:

- Users must pay all initial and ongoing costs to connect to MUFN facilities
- System users can request interconnect at MUFN system manholes, handholes, identified interconnection “wire serving or termination” locations and other splice points as determined by MUFN and designated in the course of negotiation
- MUFN may route system user fiber through its facilities at MUFN’s sole discretion, provided such routing does not materially impact system user’s use of facilities
- System users shall execute a separate agreement with reasonable terms and conditions for interconnection of MUFN facilities with a 3rd party facilities
- MUFN, with 120 day notice and minimized disruption to system user, may at its sole option and full expense, substitute fiber on any fiber segment(s) or portions thereof with an equal number of alternative fiber of like quality and specifications without impact to other portions of an existing agreement
- MUFN or its agents will be responsible for performing all “One Call” cable locates and fiber restoration activities and provide notification to system users via a 24x7 NOC

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



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

<b>Submitted Date:</b> 8/20/2009 4:54:51 PM	<b>Easygrants ID:</b> 3576
<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program	<b>Applicant Organization:</b> The Board of Regents of the University of Wisconsin System
<b>Task:</b> Submit Application - Infrastructure Programs	<b>Applicant Name:</b> Mr. Patrick Lee Christian

**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):**

**25. Interconnection Obligations Middle 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 network components and services such as wavelength or fibers at reasonable rates and terms.

Commit to binding private arbitration of disputes concerning interconnection obligations.

**Cost Effectiveness and Affordability**

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

As a middle mile project, I do not believe I was supposed to respond to this question. However, in order to properly submit, I am submitting this response as though I were providing last mile services



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

<b>Submitted Date:</b> 8/20/2009 4:54:51 PM	<b>Easygrants ID:</b> 3576
<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program	<b>Applicant Organization:</b> The Board of Regents of the University of Wisconsin System
<b>Task:</b> Submit Application - Infrastructure Programs	<b>Applicant Name:</b> Mr. Patrick Lee Christian

Total Project Cost: \$9,867,442.46  
Total Households: 47357  
Total Cost per Household: \$208.36/household

A household count of 47,357 is derived from the 22 square mile service areas to be supported by last mile partner Xicom d/b/a Mad City Broadband. MCB is proposing a a high-speed Wi-Fi Mesh network.

**27. Affordability**

MUFN has developed a pricing model with two price tiers and three price zones and 12-month terms for commercial and not-for-profit critical community organizations, anchor institutions, and public safety entities.

**Commercial Price Tier**

This tier utilizes a cost + markup pricing approach where costs for a pair of fiber on a monthly basis is calculated and then marked up by a 38% margin. Fiber costs are calculated as follows:

1. Calculate cost/strand per month for each service area over fiber life (new build) + (in-kind) / N strand fiber optic cable (FOC) / 20 years) / 12 months
  2. Calculate average cost per pair across all service area (smooth high/low cost areas)  
Ave. cost =  $(\$164.64 + 187.36 + \$132.26 + \$110.18 + \$105.17 + \$243.36)/6 = \$157.16$
  3. Add \$200/mo for operations and maintenance
  4. Added \$260/mo for NOC service
  5. Added 38% markup (\$382.84) rounded up to \$1000
- Commercial price per pair: \$1000/mo

**Not-for-profit Price Tier**

The anchor institution price tier is calculated as follows:

- \$0 Average Cost/pair (benefit to encourage not-for-profit entity use of fiber)
- \$200 Ongoing operations and maintenance
- \$0 UW-Madison providing NOC/technical support services at no charge to not-for-profit entities as a community service
- \$0 No markup assessed to not-for-profit entities
- \$200 Not-for-profit price per pair per month





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

<b>Submitted Date:</b> 8/20/2009 4:54:51 PM	<b>Easygrants ID:</b> 3576
<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program	<b>Applicant Organization:</b> The Board of Regents of the University of Wisconsin System
<b>Task:</b> Submit Application - Infrastructure Programs	<b>Applicant Name:</b> Mr. Patrick Lee Christian

**Price Zones**

MUFN proposes pricing using 3 price zones for ease of calculation and administration. Zone 1, called the central business district (CBD). Zone 2 includes all service areas West of the CBD while Zone 3 includes all service areas East of the CBD.

End-users may obtain a point-to-point fiber and/or wavelength path in Zone 1, Zone 2 or Zone 3 for the commercial rate of \$1000/mo per pair or \$200/mo per pair for not-for-profit entities. They may also obtain a point-to-point fiber and/or wavelength path from either Zone 2 or Zone 3 to Zone 1 for the same commercial and not-for-profit rate.

If an end-user requests a point-to-point fiber and/or wavelength path from Zone 2 to Zone 3, then the commercial rate shall be \$2000/mo/pair and the not-for-profit rate is \$400/mo/pair.

**Affordability**

MUFN believes our pricing model is quite affordable compared to alternatives (attachment C). Using dark fiber, end-users can easily light capacities from 100Mbps - 10Gbps.

**Commercial Service**

MUFN's commercial service offering of dark fiber and/or wavelengths, offered through partner MCB, is approximately 1/10th the cost of the lowest, similar, commercial 10 gigabit Ethernet service offering from Charter Business Networks and even more cost effective in comparison to other commercial carriers point-to-point service.

MUFN dark fiber and/or wavelength service is also competitive with comparable gigabit Ethernet service offerings from TDSMetrocom and AT&T (GigaMAN™) with exception of a MUFN Zone 2 to Zone 3 connection (passing through the CBD) which is more expensive than TDSMetrocom's CWDM service offering though our terms are more flexible than this offering (e.g. length of arrangement, scalability above 1Gbps). MUFN's service is competitive with AT&T's Bronze and Silver OPT-E-MAN™ service though MUFN's service is line rate, best effort service while AT&T's OPT-E-MAN™ allocates capacity and prioritizes applications as part of the service pricing tiers.

In addition, MUFN's pricing at minimum middle-mile bandwidth rates is competitive with similar, line rate 100Mbps offerings from Charter Business Networks for all connections



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

<b>Submitted Date:</b> 8/20/2009 4:54:51 PM	<b>Easygrants ID:</b> 3576
<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program	<b>Applicant Organization:</b> The Board of Regents of the University of Wisconsin System
<b>Task:</b> Submit Application - Infrastructure Programs	<b>Applicant Name:</b> Mr. Patrick Lee Christian

except Zone 2 to Zone 3 though it is not competitive with dissimilar service via AT&T OPT-E-MAN™.

**Not-for-Profit Service**

MUFN's service offering to not-for-profit entities is competitive with ALL commercial service offerings and across all price zones. Eligible institutions are offered service for \$200/pair or wavelength or at most \$400/pair or wavelength in attempt to deploying affordable broadband to these organizations.

## F. Technology Strategy

### 28. Technology Type:

Wireline - Fiber-optic Cable
Other

**Other:** DWDM over fiber pair

### 29. System Design

The MUFN project proposes funding for a middle-mile, terrestrial fiber and dense wave division multiplexing-based transport system. The system connects end-users to two major aggregation points in Madison, WI where Internet service provider (transit) choice and settlement-free network peering occurs.

#### Key Components

MUFN facilities will use right-of-way (ROW), conduit and fiber, where present, under existing, long-term intergovernmental agreements (contracts) with the City of Madison (MadisonCI), the State of Wisconsin Department of Transportation (WisDOT) and other miscellaneous providers (e.g. State of WI Dept of Military Affairs). These entities generally install underground conduit below the frost line in their ROW as part of their construction projects when inexpensive conduit installation can occur. Other private (e.g. University



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

<b>Submitted Date:</b> 8/20/2009 4:54:51 PM		<b>Easygrants ID:</b> 3576	
<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program		<b>Applicant Organization:</b> The Board of Regents of the University of Wisconsin System	
<b>Task:</b> Submit Application - Infrastructure Programs		<b>Applicant Name:</b> Mr. Patrick Lee Christian	

Research Park) and public (e.g. City of Middleton, Dane County) ROW from existing MUFN partner/participants, who directly benefit from such permitting, has been discussed and will be acquired on an as-needed basis such that it is not expected to delay the project implementation timeline or the proposed budget. With one noted exception on the diagram response to question 30, there are no AUP (appropriate use polices) on the ROW, conduit and/or fiber.

The City of Madison is contributing 41.75 miles of conduit and 21.75 miles of fiber as part of this project with existing fiber funding derived from grant sources which no longer exist. MUFN requests funding to build 12.25 miles of new 3" conduit in 6 service areas where conduit air gaps exist and in support of anchor institutions and commercial partner Xicom d/b/a Mad City Broadband connectivity needs (See BTOP last mile proposal titled Madison Broadband Initiative (MBI)).

Our proposal also seeks funding to install a high-count single-mode fiber cable (ITU G.652 compliant) in new/existing conduit in each service area. We note that in Service Area Map ID 6 we are requesting laterals only. Finally, we request funding for 100 conduit laterals to interconnect critical community facilities, anchor institutions and public safety entities to the middle-mile fiber. Each conduit lateral will be a single, non-diverse entrance with two 1¼" conduits. A pre-terminated 24 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 fibers to minimize backbone strand orphaning (see question 30 network diagram).

Conduit and fiber paths are designed in a ring topology where reasonably feasible with point-to-point paths elsewhere. Aerial fiber will be used on a small segment of a proposed funded service area called Monona Drive (Map ID #5) of 1.8 miles given rocky terrain. Interconnection points between rings and with broadband providers are geographically dispersed and collocated in secure, anchor institution buildings on a MUFN dedicated rack with 24x7 facility access.

MUFN seeks funding to implement two rings using passive dense wave division multiplexing (DWDM) filters with an existing fiber pair to connect 3 service areas (Service Areas 3, 4, and 5) together and provide redundant transport options to two aggregation locations where various



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

<b>Submitted Date:</b> 8/20/2009 4:54:51 PM	<b>Easygrants ID:</b> 3576
<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program	<b>Applicant Organization:</b> The Board of Regents of the University of Wisconsin System
<b>Task:</b> Submit Application - Infrastructure Programs	<b>Applicant Name:</b> Mr. Patrick Lee Christian

Internet Service Providers can be selected. The DWDM infrastructure will cost-effectively provide redundancy and interconnection for end-users in Service Area #'s 3, 4, and 5 where conduit and high-count fiber are unavailable, prohibitively expensive to build and deemed unreasonable to request funds to build. To ensure adequate optical power for absolute worst case scenario links, we have included an optical amplifier in the design.

End-users may obtain point-to-point dark fiber paths (except in Service Area 4) from their location(s) to one of the two aggregation locations or to other network locations of their choice. At aggregation locations, end-users may directly connect with the provider of their choice or may connect to the MadIX (Madison Internet Exchange) with a gigabit or (if required) 10gigabit Ethernet connection and choose one of several service providers connected to the switches.

End-users in Service Area Map ID #3 and 5 can use point-to-point dark fiber segments to connect to a ring add/drop location for redundant connectivity to the aggregation locations or to other service areas. Service Area Map ID #4 users can similarly use dark fiber to redundantly connect to the North ring add/drop location near the airport for connectivity to aggregation locations or for point-point service to other service areas.

End-users will be able to connect customer premise equipment (e.g. switch, router) they individually purchase, including pluggable optics, to the backbone fiber lateral that terminates in their building. If the end-user has a dark fiber point-to-point circuit directly with a service provider or other location on the network, the end-user and service provider can negotiate and privately procure optics to light the fiber path. If the end-user is connecting to one of the two optical rings either directly or to create an end-to-end path, MUFN will assign a specific optical frequency. Finally, if the end-user wishes to connect to the existing MadIX aggregation location equipment, then user optics must use Ethernet framing.

Finally, the last key network element is the MadIX Cisco Catalyst 6513 switch/routers. These existing devices have several gigabit and 10gigabit pluggable optics cards are funded and operated by UW-Madison as a community service to improve Internet connectivity in the area and access to campus resources.

Technology Strategy Advantages



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

<b>Submitted Date:</b> 8/20/2009 4:54:51 PM	<b>Easygrants ID:</b> 3576
<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program	<b>Applicant Organization:</b> The Board of Regents of the University of Wisconsin System
<b>Task:</b> Submit Application - Infrastructure Programs	<b>Applicant Name:</b> Mr. Patrick Lee Christian

MUFN made several technology decisions with respect to service offering capacity, speed, reliability and cost effectiveness. Those decisions include:

Underground single-mode (ITU G.652 compliant) fiber in ring architecture  
MUFN chose single mode dark fiber as its transport medium given its almost infinite scaling capacity and long-term life cycle (25 years). We are also able to leverage the substantial conduit assets the City of Madison brings to the table and UW-Madison's optical expertise to cost-effectively install and operate such a service with more protection than aerial fiber, no pole rental fees, and less polarization mode dispersion effects over time. A ring topology offers reliability as fiber mean time to repair can be 12-24 hours. Finally, we note using G.652 (e.g. SMF-28) fiber enables end-users to use 1310nm optics for some applications.

#### Passive DWDM Filters

We strongly considered active optics and passive CWDM filters to light the two rings in our proposal but opted for a more cost-effective (low/no operational expense), high capacity (# channels & 10Gbps support), long-term life cycle option that can scale with new/future pluggable optics choices. We also feel that ITU grid DWDM optics have reached a tipping point in terms of price and availability. Finally, MUFN determined that most anchor institutions do not have hardened data center facilities such that we were concerned about adequate and reliable power and cooling. By keeping the core of the network relatively simple and allows end-users to make decisions about equipment they need. We felt that ITU grid DWDM optics are reaching a tipping point in price, availability and support in vendor switches and routers that now was the time to invest.

#### Cisco 6513 Ethernet Switch/Router at Aggregation Nodes

Ethernet is a dominant LAN technology and is clearly becoming dominant in WAN architectures. High-capacity port costs are lower than other options and are readily available. UW selected Cisco given a strong relationship, significant price discounts and staff who have significant experience and product knowledge. Should density be an issue, we can easily add small, gigabit Ethernet switches with 10Gbps uplinks to further scale switch capacity.

#### Plans to Upgrade System and Add Additional Capabilities

MUFN anticipates several upgrades over time. These enhancements include



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

<b>Submitted Date:</b> 8/20/2009 4:54:51 PM	<b>Easygrants ID:</b> 3576
<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program	<b>Applicant Organization:</b> The Board of Regents of the University of Wisconsin System
<b>Task:</b> Submit Application - Infrastructure Programs	<b>Applicant Name:</b> Mr. Patrick Lee Christian

- Seek more Internet Service Providers to participate
- Add fiber along major arterial roads to augment existing service area redundancy and capacity – particularly to Service Area Map ID #4 after road reconstruction in 2016
- Upgrading the passive filters as demand requires
- Adding DWDM filters on the AUP restricted fiber pairs providing redundancy in Service Area Map ID #2 as demand warrants
- Pull more fiber in 3” conduit as high-count fiber strands are utilized

**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**



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

<b>Submitted Date:</b> 8/20/2009 4:54:51 PM	<b>Easygrants ID:</b> 3576
<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program	<b>Applicant Organization:</b> The Board of Regents of the University of Wisconsin System
<b>Task:</b> Submit Application - Infrastructure Programs	<b>Applicant Name:</b> Mr. Patrick Lee Christian

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

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

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

1. City of Madison
  - a. 20 year conduit and fiber intergovernmental agreement (WI Statute 66.0301) (with renewal options) approved by the City Council and executed 3/2007
  - b. Xiocom d/b/a Mad City Broadband Letter of Intent to Contract issued 6/2009
  
2. Wisconsin Department of Transportation
  - a. 20 year fiber right to use master agreement (with renewal options) executed 7/2003
  - b. 20 year fiber right to use amendment (Amendment C) for East Madison fiber pair (as part of proposed funded service area #4 (Northport Area) “North Ring”)
  
3. Fiore Companies
  - a. 222 W. Washington Blvd (aggregation node) conduit and fiber entrance and collocation agreement executed 12/2004
  
4. Metropolitan Unified Fiber Network (MUFN) Consortium
  - a. Intergovernmental (WI Statute 66.0301) agreement (in legal review now with consortium member legal counsel offices) for collocation and participation

**36. Construction and Vendor Contracts**

MUFN plans to use Cable Constructors, Inc (CCI Systems) as a general contractor to perform conduit and fiber installations. We have an existing contract with CCI and have received and attached a letter of support from them noting their support and ability to immediately begin work. We note that during our planned 2 year project horizon, our agreement with CCI expires. MUFN has already issued a bid and has received responses from several contractors, including CCI. We intend to qualify multiple vendors and will almost undoubtedly include CCI on that award list in October 2009.

MUFN also intends to use 3rd party project management and engineering resources to augment the team already in place at the University of Wisconsin – Madison and the City of Madison



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

<b>Submitted Date:</b> 8/20/2009 4:54:51 PM	<b>Easygrants ID:</b> 3576
<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program	<b>Applicant Organization:</b> The Board of Regents of the University of Wisconsin System
<b>Task:</b> Submit Application - Infrastructure Programs	<b>Applicant Name:</b> Mr. Patrick Lee Christian

during peak periods. MUFN has existing contracts in place with iNOC and Strang Engineering that are included in our response.

Finally, MUFN has existing master agreements with Graybar and Anixter to source optical hardware and miscellaneous network components made in the United States.

Beyond these agreements, UW-Madison and the City of Madison Traffic Engineering Department will perform all other services in support of MUFN installation and long-term, sustainable operations.

Specific support and contracts MUFN will use include via usual and customary State of Wisconsin procurement channels include:

1. Cable Constructors, Inc. (CCI Systems)
  - a. Fiber construction and restoration services agreement executed 8/2006 with extensions to 8/2010
  - b. (new) 5 year fiber construction and restoration services agreement bid; responses received 7/16/2009 with awards to be made in Oct 2009
  - c. Attached letter of support
2. Strang Engineering
  - a. Project engineering service agreement
3. iNOC (project management via Wisconsin Department of Transportation contract for Intelligent Transportation System operations and management)
4. UW agreements with Graybar and Anixter to source network and electronics equipment directly (e.g. relay racks, external cabinets)

**Qualification of Management Team and Organizational Readiness**





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

<b>Submitted Date:</b> 8/20/2009 4:54:51 PM		<b>Easygrants ID:</b> 3576	
<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program		<b>Applicant Organization:</b> The Board of Regents of the University of Wisconsin System	
<b>Task:</b> Submit Application - Infrastructure Programs		<b>Applicant Name:</b> Mr. Patrick Lee Christian	

**37. Management Team Resumes:**

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

**38. Organizational Readiness:**

UW has performed facility-based network management services for over 20 years, starting with on-campus fiber to over 275 buildings in 1988. More recently, we have provided implementation and network management services for over five years on a 2600 mile, regional optical network in 6 states (WI, IL, MN, ND, IA, MO) for research, education and administrative purposes. The fiber is lit by Infinera dense wave division multiplexing (DWDM) optical hardware collocated in over 50 locations throughout the region. In addition, UW provides network management services for more than 75 miles of metro fiber in 5 cities (Chicago, Milwaukee, Eau Claire, Appleton/Oshkosh, and Madison) using a variety of active and passive wave-division multiplexing (WDM) and baseband technologies. Finally, UW provides network management services to WiscNet, a WI research, education, government and health (ISP) network since 1990. This statewide network serves over 450 education, government and hospital institutions using a variety of transport, switching and routing technologies.

To provide these services, UW has an extensive operations support infrastructure with established procedures and trained staff. This includes a primary and backup 24x7 network operations center and various redundant communication and network monitoring systems. Other operations support systems also include an incident trouble ticket system, a change management system, a home-grown project management system, a contact database and a document management system for procedures.

UW will use its existing billing, fiber documentation, grants, contract management and accounting systems to encompass MUFN administrative management requirements. This will include all compliance and progress reporting as required by the American Recovery and Reinvestment Act (ARRA) law or administratively defined by NTIA, OMB or other agency.

An experienced team of 16 network engineers will provide 24x7 MUFN technical support, engineering and provisioning services. The team has access to, training on, and experience with various optical troubleshooting tools (e.g. OTDR, power meters). The support group is



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

<b>Submitted Date:</b> 8/20/2009 4:54:51 PM	<b>Easygrants ID:</b> 3576
<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program	<b>Applicant Organization:</b> The Board of Regents of the University of Wisconsin System
<b>Task:</b> Submit Application - Infrastructure Programs	<b>Applicant Name:</b> Mr. Patrick Lee Christian

nationally/internationally recognized.

Fiber maintenance will be provided by the experienced technicians at the City of Madison Traffic Engineering department, a MUFN strategic partner. The City will perform maintenance activities including fiber route surveillance, One Call (aka Digger's Hotline in WI) callouts to locate and mark fiber and conduit/fiber break-fix operations on a 24x7 basis.

MUFN will be implemented through a project team comprised of UW, the City of Madison and fiber construction vendor-partners (e.g. CCI Systems) already on contract. UW will provide experienced and certified (PMP) project management personnel with outside plant project experience. UW will also provide knowledgeable outside plant engineers with professional, commercial carrier experience in addition to previously mentioned optical engineers.

The City of Madison team participants include knowledgeable and experienced design engineers and field technicians who will perform design engineering and implementation supervision.

Vendor-partners will perform final permitting, material ordering, conduit and fiber installation, splicing, testing and as-built documentation per specification of UW and City of Madison engineers while UW optical engineers will certify the optical results and accept the work.

MUFN is organizing as an intergovernmental entity under WI Statute 66.03. The agreement creates a joint venture among the participating anchor institutions with rights to contractually bind the group.

A MUFN Oversight Group comprised of one person designated by each participating institution will serve as the Board of Directors with each representative having equal voting rights.

UW-Madison will serve as the MUFN contractual, fiscal and operations agent for the MUFN Oversight Group.

**Other**



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

<b>Submitted Date:</b> 8/20/2009 4:54:51 PM	<b>Easygrants ID:</b> 3576
<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program	<b>Applicant Organization:</b> The Board of Regents of the University of Wisconsin System
<b>Task:</b> Submit Application - Infrastructure Programs	<b>Applicant Name:</b> Mr. Patrick Lee Christian

**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:**

The Madison Unified Fiber Network (MUFN) is a collaborative effort to unify, leverage and augment existing, disparate network resources from within community anchor institutions and public safety entities in the greater Madison, Middleton and Monona city areas. Our strategy is to identify and approach education, government, hospital and other not-for-profit entities to join our efforts – particularly where existing and proposed conduit or fiber passes within several blocks of a given entity. MUFN also identifies and seeks commercial partners that can provide significant benefits to the group (See complimentary BTOP last mile Wi-Fi Madison Broadband Initiative: MBI proposal). Finally, MUFN, working with DANENet, seeks to interconnect community organizations serving low-income, vulnerable or job creation groups clustered in buildings on or near fiber routes to provide or upgrade broadband access. Entities involved in this effort and their contributions include:

City of Madison (board rep, collocation, conduit, engineer, fiber, fiscal, plan, right-of-way); Dane County (board rep, fiscal, right-of-way); DANENet (planning, fiscal); Madison Area Technical College (board rep., collocation, fiscal, planning); Madison Metropolitan School District (board rep., collocation, fiscal, planning); Monona Grove School District (board rep, collocation, fiscal); State Lab of Hygiene (board rep, collocation, fiscal); South Central Library System (board rep., fiscal, planning); UW-Extension (board rep., fiscal); UW-Health (board rep, collocation, fiber, fiscal); UW-Madison (board rep., collocation, engineer, fiscal, operations, planning); Xicom d/b/a Mad City Broadband (engineer, fiber, fiscal, installation, operations, plan)

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

The MUFN project proposes funding for a NTIA BTOP middle-mile, terrestrial fiber and dense wave division multiplexing-based transport system. The system connects end-users to two major aggregation points in Madison, WI where Internet service provider choice and settlement-free network peering occurs.



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

<b>Submitted Date:</b> 8/20/2009 4:54:51 PM	<b>Easygrants ID:</b> 3576
<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program	<b>Applicant Organization:</b> The Board of Regents of the University of Wisconsin System
<b>Task:</b> Submit Application - Infrastructure Programs	<b>Applicant Name:</b> Mr. Patrick Lee Christian

MUFN project conduit and fiber resources are primarily from the City of Madison. The City typically installs conduit in their right-of-way as part of major arterial street projects. The City of Madison has received the following stimulus funds from the State of Wisconsin who in turn received them from Federal transportation sources:

CTH MS, Shorewood Blvd to Segoe Road.

Project will replace paving and installation of conduit in the City of Madison's right-of-way.

Funding: \$3,200,000

Source: Federal Aid Urban Funding Administered by Madison Area Metro Planning Org

CTH S (Mineral Point Road) and Pleasant View Road Intersection and Pleasant View Road from CTH S south 0.5 Miles.

Project will reconstruct road intersection and install conduit in the City's right-of-way.

Funding Request: \$2,930,000

Source: Federal Aid Urban Funding Administered by Madison Area Metro Planning Org

CTH M, Valley View, and Pleasant View Intersection and Pleasant View Road from Valley View Road north 0.5 Miles.

Project will extend Pleasant View Rd and include conduit in the City of Madison's right-of-way.

This project will be combined with an existing project at CTH M and Valley View Road with estimated cost of \$1,860,000. The extension of Pleasant View Road to the south requires an additional expenditure of \$1,930,000 for a total project cost of \$3,790,000.

Funding Request: \$1,930,000

Source: Federal Aid Urban Funding Administered by Madison Area Metro Planning Org

The MUFN project will leverage the Federal Department of Transportation stimulus projects by using conduit installed when the road is repaved or constructed. As a direct result, we are able to reduce our NTIA BTOP conduit installation funding request in these sections of the project.

MUFN is an example of how collaboration can lead to greater project efficiencies. For example, working with the City of Madison Traffic Engineering, MUFN project leaders were



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

<b>Submitted Date:</b> 8/20/2009 4:54:51 PM	<b>Easygrants ID:</b> 3576
<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program	<b>Applicant Organization:</b> The Board of Regents of the University of Wisconsin System
<b>Task:</b> Submit Application - Infrastructure Programs	<b>Applicant Name:</b> Mr. Patrick Lee Christian

able to identify planned road project schedules when conduit would be installed and plan accordingly. This enables the MUFN project to reduce its total cost, execute faster by only pulling fiber through existing conduit and disrupt fewer commuters on roadways when conduit would otherwise be installed.

MUFN is a collaborative effort involving various education, government, health-care and library groups to improve broadband service in the greater Madison metropolitan area. Through this collaboration, MUFN participants have brought different skill sets and resources (e.g. conduit, technical knowledge) together to create a synergy that no one group could otherwise do themselves.

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

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

UW has a policy of preferring disadvantaged businesses if their bids are within 5% of the lowest bidder - all else equal.

UW-Madison is able to work with Xiocom Wireless D/B/A MadCity Broadband (MCB). MCB has established agreements in principle to contract with Universal Electric, which is a socially and economically disadvantaged small businesses (SDB) in Madison, Wisconsin, as defined by section 8(a) of the Small Business Act, 15 U.S.C. §637.

UW-Madison will subcontract fiber termination work to MCB who in turn will hire and contract with Universal Electric to terminate certain fiber on the MUFN network and for commercial electrical work.

## **H. Project Budget**

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



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

<b>Submitted Date:</b> 8/20/2009 4:54:51 PM		<b>Easygrants ID:</b> 3576	
<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program		<b>Applicant Organization:</b> The Board of Regents of the University of Wisconsin System	
<b>Task:</b> Submit Application - Infrastructure Programs		<b>Applicant Name:</b> Mr. Patrick Lee Christian	

Budget	Loan Request	Grant Request	Equity	Debt	Bond	Other
Network & Access Equipment (switching, routing, transport, access)		131,764				
Outside Plant (cables, conduits, ducts, poles, towers, repeaters, etc.)		4,704,769				3,223,547
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.)						
Operating Equipment						



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

<b>Submitted Date:</b> 8/20/2009 4:54:51 PM		<b>Easygrants ID:</b> 3576	
<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program		<b>Applicant Organization:</b> The Board of Regents of the University of Wisconsin System	
<b>Task:</b> Submit Application - Infrastructure Programs		<b>Applicant Name:</b> Mr. Patrick Lee Christian	

(vehicles, office equipment, other)						
Engineering/ Professional Services (engineering design, project management, consulting, etc.)		426,400				
Testing (network elements, IT system elements, user devices, test generators, lab furnishings, servers/computers, etc.)						
Site Preparation		10,000				
Other		840,963				530,000
<b>TOTAL BROADBAND SYSTEM</b>		<b>6,113,896</b>				<b>3,753,547</b>



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

<b>Submitted Date:</b> 8/20/2009 4:54:51 PM	<b>Easygrants ID:</b> 3576
<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program	<b>Applicant Organization:</b> The Board of Regents of the University of Wisconsin System
<b>Task:</b> Submit Application - Infrastructure Programs	<b>Applicant Name:</b> Mr. Patrick Lee Christian

**Total Budget:** \$ 9,867,443

**45. Detailed Budget:**

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

**Sustainability**

**46. Reasonableness**

MUFN has made significant effort to ensure our proposal is reasonable, necessary and appropriate in order to maximize benefit while minimizing costs.

In the network & access equipment area, we request transport equipment (DWDM passive filters) as we only have one fiber pair available for a portion of two service areas and do not believe it is reasonable to request funds to build more fiber for these two service areas. This gear enables us to reliably provide redundant connectivity to aggregation node locations for ISP choice (see design in question 30 for details). We have sized the filters to handle planned initial demand with modest growth capacity. Unit prices were obtained by a simplified bidding process with the lowest quote used in our proposal. We note all 4 respondents pricing were within 2%.

Outside Plant, namely conduit and fiber, represents MUFN's largest project expenditure area. A single, 3" high-density polyethylene (HDPE) conduit is used to meet City of Madison specifications and to allow for future system growth by pulling more fiber through the conduit system. Two 1 1/4" conduits are used at interconnection lateral points as costs are less expensive than installing one 2" or 3" conduit. This allows for growth at interconnection locations. Lineal footage is minimizing by identifying the shortest point-to-point path of minimal depth below the frost line for both middle mile and lateral paths. The lowest cost installation method allowed by the permitting entity is used (e.g. aerial in difficult terrain and directional boring where plowing plus restoration cost is higher or not feasible). Finally, we used unit pricing from an existing, competitive open bid process contract that State agencies (e.g. WisDOT) use for fiber projects.

Fiber optic cable size was determined by initial planned demand representing approximately 1/3 of total cable capacity. Our cable pricing analysis indicates cables in the 72 to 144 strand count range are about the same cost with significant cost increases for larger cable sizes such that we use 96 or 144 strand count cables to meet minimum initial capacity needs (1/3 of cable) and





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

<b>Submitted Date:</b> 8/20/2009 4:54:51 PM		<b>Easygrants ID:</b> 3576	
<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program		<b>Applicant Organization:</b> The Board of Regents of the University of Wisconsin System	
<b>Task:</b> Submit Application - Infrastructure Programs		<b>Applicant Name:</b> Mr. Patrick Lee Christian	

maximize cable size cost/benefit. We do not splice all lateral strands to the backbone to maximize operational flexibility and minimize splice costs. Finally, we note that fiber route distance approximates actual route distance with allowances for slack cable necessary to recover from a fiber cut or enable future end-users to tap into the existing system at new locations.

MUFN will use significant, existing resources from the University of Wisconsin – Madison to successfully complete the proposed plan. These resources include wide-area network engineers who will, at minimum, be responsible for network design (e.g. laterals), performing site surveys with construction and building owner facilities personnel, providing construction management oversight, procuring and installing DWDM filters on 2 rings, performing OTDR and power meter acceptance tests with existing equipment and developing system and other documentation to be stored in an existing UW fiber database management system for the 32.5 miles of fiber and 100 laterals we request. Additionally, UW’s Research and Sponsored Programs (RSP) group will utilize existing grant administration accounting and reporting systems for grant reporting, compliance and accounts payable systems. Given this significant use of UW systems, UW requests its Department of Commerce general indirect cost rate of 26% for off-campus projects.

Finally, MUFN requests an engineering and project management contractor to assist our staff during peak planning periods – namely 2 six month winter periods. The rates are existing contract rates from competitive bids and the hours are based on the project plan needs.

**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**

Funding Source #1:

Name of party: University of Wisconsin – Madison



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

<b>Submitted Date:</b> 8/20/2009 4:54:51 PM		<b>Easygrants ID:</b> 3576	
<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program		<b>Applicant Organization:</b> The Board of Regents of the University of Wisconsin System	
<b>Task:</b> Submit Application - Infrastructure Programs		<b>Applicant Name:</b> Mr. Patrick Lee Christian	

Funding Amount (and % of project cost): \$530,000 5.4% of project cost  
Type of funding: grant match  
Use of funding: infrastructure  
Key financing terms & conditions:

Given the economic situation, UW-Madison commits to and is financing the up-front cash contribution for all MUFN participants over 10 years. UW-Madison will charge back each participating entity on an annual basis as follows:

\$8400 UW-Madison (DoIT), UW-Health (UWMF, UWHC)

\$4175 State Lab of Hygiene, UW-Madison (Medical School), Dane County, University Research Park, Madison Area Technical College, City of Madison, Madison Metropolitan School District

\$1400 Monona Grove School District, Middleton Cross Plains Area SD, South Central Library System, UW-Madison (Graduate School), UW-Extension (WGNHS)

\$0 DaneNet

We note we are not assessing the over two-dozen community organizations represented by the “umbrella group” DaneNet given the current strains on their funding and services they provide to vulnerable populations currently in need.

Funding Source #2:

Name of party: City of Madison Traffic Engineering  
Funding Amount (and % of project cost): \$3,223,546 32.7% of project cost  
Type of funding: grant match  
Use of funding: infrastructure  
Key financing terms & conditions: None

**BTOP Requirements**



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

<b>Submitted Date:</b> 8/20/2009 4:54:51 PM	<b>Easygrants ID:</b> 3576
<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program	<b>Applicant Organization:</b> The Board of Regents of the University of Wisconsin System
<b>Task:</b> Submit Application - Infrastructure Programs	<b>Applicant Name:</b> Mr. Patrick Lee Christian

**52. Matching Funds:**

- a. Cash: \$ 530,000.00
- b. In-Kind: \$ 3,223,547.00
- c. Percent of Total Project Cost: 38

**53. Demonstration of Financial Need:**

For several years, technology staff from the City of Madison, the Madison Metropolitan School District, Dane County, the University of Wisconsin-Madison and others, 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 Madison Metropolitan School District alone, budget cuts for the current year are expected to be over \$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, Dane County and the University of Wisconsin – Madison 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. The 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.

MUFN’s total project cost is \$10,397,000 with a grant funding request for \$6,643,000. 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. At the University of Wisconsin – Madison, while the institution has a large budget, the funds are dispersed across the campus such that colleges, schools and departments only fund things that are in their self interest such that these funds are not available to address the middle mile technical infrastructure which is sought through this MUFN proposal. Similar restrictions



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

<b>Submitted Date:</b> 8/20/2009 4:54:51 PM	<b>Easygrants ID:</b> 3576
<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program	<b>Applicant Organization:</b> The Board of Regents of the University of Wisconsin System
<b>Task:</b> Submit Application - Infrastructure Programs	<b>Applicant Name:</b> Mr. Patrick Lee Christian

on City funds and the funds of other MUFN partners prevent MUFN from coming to fruition but for federal grant assistance.

Finally, the business case presented by a MUFN last mile provider, Xioicom d/b/a Mad City Broadband (see NTIA BTOP Madison Broadband Initiative (MBI) last mile proposal) in response to questions 44 shows that we are unable to obtain additional funding from Xioicom such that MUFN would not be economically feasible without grant financing.

**54. Unjust Enrichment**

The Board of Regents of the University of Wisconsin System on behalf of the University of Wisconsin – Madison has not received any Federal support for non-recurring costs in the service area for which we are seeking an NTIA BTOP award nor have we applied for such funds. The Madison Broadband Initiative (MBI) project is a complimentary proposal to the Madison Broadband Initiative (MBI) project, which is being submitted by the City of Madison. The MUFN project has no overlapping services with the MBI project.

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

The Board of Regents of the University of Wisconsin System on behalf of the University of Wisconsin – Madison has not received or applied for any other Federal or State funding, which would apply to the Metropolitan Unified Fiber Network (MUFN) project. The MUFN is an NTIA BTOP middle-mile proposal.

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

**56. Self Scoring Sheet**



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

<b>Submitted Date:</b> 8/20/2009 4:54:51 PM		<b>Easygrants ID:</b> 3576	
<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program		<b>Applicant Organization:</b> The Board of Regents of the University of Wisconsin System	
<b>Task:</b> Submit Application - Infrastructure Programs		<b>Applicant Name:</b> Mr. Patrick Lee Christian	

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	



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

<b>Submitted Date:</b> 8/20/2009 4:54:51 PM		<b>Easygrants ID:</b> 3576	
<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program		<b>Applicant Organization:</b> The Board of Regents of the University of Wisconsin System	
<b>Task:</b> Submit Application - Infrastructure Programs		<b>Applicant Name:</b> Mr. Patrick Lee Christian	

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	



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

<b>Submitted Date:</b> 8/20/2009 4:54:51 PM		<b>Easygrants ID:</b> 3576	
<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program		<b>Applicant Organization:</b> The Board of Regents of the University of Wisconsin System	
<b>Task:</b> Submit Application - Infrastructure Programs		<b>Applicant Name:</b> Mr. Patrick Lee Christian	

	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	



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

<b>Submitted Date:</b> 8/20/2009 4:54:51 PM	<b>Easygrants ID:</b> 3576
<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program	<b>Applicant Organization:</b> The Board of Regents of the University of Wisconsin System
<b>Task:</b> Submit Application - Infrastructure Programs	<b>Applicant Name:</b> Mr. Patrick Lee Christian

## 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





**Broadband Infrastructure Application  
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<b>Submitted Date:</b> 8/20/2009 4:54:51 PM		<b>Easygrants ID:</b> 3576	
<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program		<b>Applicant Organization:</b> The Board of Regents of the University of Wisconsin System	
<b>Task:</b> Submit Application - Infrastructure Programs		<b>Applicant Name:</b> Mr. Patrick Lee Christian	

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:**  
**Census Blocks in Proposed Funded Service Area:**  
**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:**

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

**Total Square Miles of Community:**



**Broadband Infrastructure Application  
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<b>Task:</b> Submit Application - Infrastructure Programs		<b>Applicant Name:</b> Mr. Patrick Lee Christian	

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

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

**Middle Mile Span Name:** University Ave

**Census Blocks in Middle Mile Span:** 5502548000480000008001000-  
5502548000480000008001005, 5502548000480000008003000-5502548000480000008003001,  
5502548000480000003001000-5502548000480000003001006, 5502548000480000003002011,  
5502573750737500101001025, 5502573750737500101002022-5502573750737500101002024,  
5502573750737500101002012-5502573750737500101002016,  
5502573750737500101001009, 5502548000480000002011000, 5502548000480000002011010,  
5502548000480000002011027-5502548000480000002011030, 5502548000480000003001011,  
5502548000480000003003000, 5502548000480000003003004, 5502548000480000003003007,  
5502548000480000009004000-5502548000480000009004002, 5502548000480000009004005  
5502548000480000009005000-5502548000480000009005002, 5502548000480000032001007-  
5502548000480000032001009, 5502548000480000011001007, 5502548000480000011001009,  
5502548000480000009001000, 5502548000480000032002004-5502548000480000032002007,  
5502548000480000004021006-5502548000480000004021007, 5502548000480000004041000,  
5502548000480000002012009

**Last Mile Service Area Name:** 1  
**Community Name:** City of Madison  
**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



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

<b>Submitted Date:</b> 8/20/2009 4:54:51 PM	<b>Easygrants ID:</b> 3576
<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program	<b>Applicant Organization:</b> The Board of Regents of the University of Wisconsin System
<b>Task:</b> Submit Application - Infrastructure Programs	<b>Applicant Name:</b> Mr. Patrick Lee Christian

**BTOP - If Service Status is "Underserved" please select at least one applicable option from this list.**  
The rate of broadband subscribership for the proposed funded service area is 40% of households or less.

**Total Square Miles of Service Area: 77**  
**Total Population : 32,453**  
**Total Number of Households: 12,468**  
**Total Number of Businesses: 582**  
**Total Number of Critical Community Facilities, Anchor Institutions and Public Safety Entities: 22**

**Middle Mile Span Name: University Ave**

**Census Blocks in Middle Mile Span:** 5502548000480000008001000-5502548000480000008001005, 5502548000480000008003000-5502548000480000008003001, 5502548000480000003001000-5502548000480000003001006, 5502548000480000003002011, 5502573750737500101001025, 5502573750737500101002022-5502573750737500101002024, 5502573750737500101002012-5502573750737500101002016, 5502573750737500101001009, 5502548000480000002011000, 5502548000480000002011010, 5502548000480000002011027-5502548000480000002011030, 5502548000480000003001011, 5502548000480000003003000, 5502548000480000003003004, 5502548000480000003003007, 5502548000480000009004000-5502548000480000009004002, 5502548000480000009004005, 5502548000480000009005000-5502548000480000009005002, 5502548000480000032001007-5502548000480000032001009, 5502548000480000011001007, 5502548000480000011001009, 5502548000480000009001000, 5502548000480000032002004-5502548000480000032002007, 5502548000480000004021006-5502548000480000004021007, 5502548000480000004041000, 5502548000480000002012009

**Last Mile Service Area Name:** 1  
**Community Name:** Village of Shorewood Hills  
**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



**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> The Board of Regents of the University of Wisconsin System
<b>Task:</b> Submit Application - Infrastructure Programs	<b>Applicant Name:</b> Mr. Patrick Lee Christian

**BTOP - If Service Status is "Underserved" please select at least one applicable option from this list.**  
The rate of broadband subscribership for the proposed funded service area is 40% of households or less.

**Total Square Miles of Service Area: 1**  
**Total Population : 32,453**  
**Total Number of Households: 12,468**  
**Total Number of Businesses: 582**  
**Total Number of Critical Community Facilities, Anchor Institutions and Public Safety Entities: 22**

**Middle Mile Span Name: Mineral Point Rd**

**Census Blocks in Middle Mile Span:** 5502548000480000004021006,  
5502548000480000004021007, 5502548000480000004041000, 5502548000480000004041039,  
5502548000480000002011030, 5502548000480000002012009, 5502548000480000002022005,  
5502548000480000002022010, 5502548000480000002022006, 5502548000480000002022007,  
5502548000480000002041006, 5502548000480000002042014,  
5502548000480000002042017, 5502548000480000002041007, 5502548000480000002042016,  
5502548000480000002042023, 5502548000480000003002011, 5502548000480000003002008,  
5502548000480000003003007, 5502548000480000003003010, 5502548000480000003002010,  
5502548000480000003002009, 5502548000480000004012000, 5502548000480000004011004,  
5502548000480000004011007, 5502548000480000004012004, 5502548000480000004012005,  
5502548000480000004011038, 5502548000480000004012010, 5502548000480000004011030,  
5502548000480000004012011, 5502548000480000004011031, 5502548000480000004012012,  
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5502548000480000004011034, 5502548000480000004011033, 5502548000480000004012015,  
5502548000480000004011035, 5502548000480000004012016, 5502548000480000004012017,  
5502548000480000004011036, 5502548000480000004021004, 5502548000480000004021003,  
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5502548000480000004021000, 5502548000480000004021007, 5502548000480000004031000,  
5502548000480000004031001, 5502548000480000004031002, 5502548000480000004031003,  
5502548000480000004031014, 5502548000480000004031019, 5502548000480000004031022,  
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5502548000480000004031032, 5502548000480000004031035, 5502548000480000004031044,  
5502548000480000004041000, 5502548000480000004041001, 5502548000480000004041002,



**Broadband Infrastructure Application  
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<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program		<b>Applicant Organization:</b> The Board of Regents of the University of Wisconsin System	
<b>Task:</b> Submit Application - Infrastructure Programs		<b>Applicant Name:</b> Mr. Patrick Lee Christian	

5502548000480000004041003, 5502548000480000004041008, 5502548000480000004041009, 5502548000480000004041010, 5502548000480000004041039, 5502548000480000007001005, 5502548000480000007001014, 5502548000480000007002006, 5502548000480000008003015, 5502548000480000009003007, 5502548000480000009003000, 5502548000480000009002000, 5502548000480000009002001, 5502548000480000009002002, 5502548000480000009003013, 5502548000480000009002003, 5502548000480000009002004, 5502548000480000009003014, 5502548000480000009003020, 5502548000480000009002014, 5502548000480000009003024, 5502548000480000009002015, 5502548000480000009003025, 5502548000480000010001007, 5502548000480000010001006, 5502548000480000010002009, 5502548000480000010002021, 5502548000480000011002028, 5502548000480000011002008, 5502548000480000011002027, 5502548000480000011002029, 5502548000480000011002030, 5502548000480000011002037, 5502548000480000011002038, 5502548000480000011002039, 5502548000480000012003002, 55025480004800000109011032, 55025480004800000109011028, 55025480004800000109011054, 55025480004800000109011053, 55025480004800000109011040, 55025480004800000109011041, 55025480004800000109011044, 55025480004800000109011052, 55025480004800000109011051, 55025480004800000109011068, 5502551600999990004031013, 5502551600999990004031017, 5502551600999990004031024, 5502551600999990004031031, 5502551600999990004031041, 5502551600999990004031030, 5502551600999990004031043, 5502551600999990109011038, 5502551600999990109011042, 5502551600999990109011078, 5502551600999990109011077, 5502551600999990109011043, 5502551600999990109011074, 5502551600999990109023000

**Last Mile Service Area Name:** 2  
**Community Name:** City of Madison  
**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>
The rate of broadband subscribership for the proposed funded service area is 40% of households or less.

**Total Square Miles of Service Area:** 77  
**Total Population :** 20,043



**Broadband Infrastructure Application  
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<b>Task:</b> Submit Application - Infrastructure Programs	<b>Applicant Name:</b> Mr. Patrick Lee Christian

**Total Number of Households: 8,626**

**Total Number of Businesses: 862**

**Total Number of Critical Community Facilities, Anchor Institutions and Public Safety Entities: 42**

**Middle Mile Span Name: Mineral Point Rd**

**Census Blocks in Middle Mile Span:** 5502548000480000004021006,  
5502548000480000004021007, 5502548000480000004041000, 5502548000480000004041039,  
5502548000480000002011030, 5502548000480000002012009, 5502548000480000002022005,  
5502548000480000002022010, 5502548000480000002022006, 5502548000480000002022007,  
5502548000480000002041006, 5502548000480000002042014,  
5502548000480000002042017, 5502548000480000002041007, 5502548000480000002042016,  
5502548000480000002042023, 5502548000480000003002011, 5502548000480000003002008,  
5502548000480000003003007, 5502548000480000003003010, 5502548000480000003002010,  
5502548000480000003002009, 5502548000480000004012000, 5502548000480000004011004,  
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5502548000480000004011036, 5502548000480000004021004, 5502548000480000004021003,  
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5502548000480000004031021, 5502548000480000004031016, 5502548000480000004031025,  
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5502548000480000004041003, 5502548000480000004041008, 5502548000480000004041009,  
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5502548000480000007001014, 5502548000480000007002006, 5502548000480000008003015,  
5502548000480000009003007, 5502548000480000009003000, 5502548000480000009002000,



**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> The Board of Regents of the University of Wisconsin System	
<b>Task:</b> Submit Application - Infrastructure Programs		<b>Applicant Name:</b> Mr. Patrick Lee Christian	

5502548000480000009002001, 5502548000480000009002002, 5502548000480000009003013, 5502548000480000009002003, 5502548000480000009002004, 5502548000480000009003014, 5502548000480000009003020, 5502548000480000009002014, 5502548000480000009003024, 5502548000480000009002015, 5502548000480000009003025, 5502548000480000010001007, 5502548000480000010001006, 5502548000480000010002009, 5502548000480000010002021, 5502548000480000011002028, 5502548000480000011002008, 5502548000480000011002027, 5502548000480000011002029, 5502548000480000011002030, 5502548000480000011002037, 5502548000480000011002038, 5502548000480000011002039, 5502548000480000012003002, 55025480004800000109011032, 55025480004800000109011028, 55025480004800000109011054, 55025480004800000109011053, 55025480004800000109011040, 55025480004800000109011041, 55025480004800000109011044, 55025480004800000109011052, 55025480004800000109011051, 55025480004800000109011068, 5502551600999990004031013, 5502551600999990004031017, 5502551600999990004031024, 5502551600999990004031031, 5502551600999990004031041, 5502551600999990004031030, 5502551600999990004031043, 5502551600999990109011038, 5502551600999990109011042, 5502551600999990109011078, 5502551600999990109011077, 5502551600999990109011043, 5502551600999990109011074, 5502551600999990109023000

**Last Mile Service Area Name:** 2  
**Community Name:** Town of Middleton  
**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.**  
 The rate of broadband subscribership for the proposed funded service area is 40% of households or less.

**Total Square Miles of Service Area: 15**  
**Total Population : 20,043**  
**Total Number of Households: 8,626**  
**Total Number of Businesses: 862**  
**Total Number of Critical Community Facilities, Anchor Institutions and Public Safety Entities: 42**



**Broadband Infrastructure Application  
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<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program	<b>Applicant Organization:</b> The Board of Regents of the University of Wisconsin System
<b>Task:</b> Submit Application - Infrastructure Programs	<b>Applicant Name:</b> Mr. Patrick Lee Christian

**Middle Mile Span Name:** Mineral Point Rd

**Census Blocks in Middle Mile Span:** 5502548000480000004021006,  
5502548000480000004021007, 5502548000480000004041000, 5502548000480000004041039,  
5502548000480000002011030, 5502548000480000002012009, 5502548000480000002022005,  
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5502548000480000004031032, 5502548000480000004031035, 5502548000480000004031044,  
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5502548000480000004041003, 5502548000480000004041008, 5502548000480000004041009,  
5502548000480000004041010, 5502548000480000004041039, 5502548000480000007001005,  
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5502548000480000010001006, 5502548000480000010002009, 5502548000480000010002021,  
5502548000480000011002028, 5502548000480000011002008, 5502548000480000011002027,





**Broadband Infrastructure Application  
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<b>Task:</b> Submit Application - Infrastructure Programs		<b>Applicant Name:</b> Mr. Patrick Lee Christian	

5502548000480000011002029, 5502548000480000011002030, 5502548000480000011002037, 5502548000480000011002038, 5502548000480000011002039, 5502548000480000012003002, 55025480004800000109011032, 55025480004800000109011028, 55025480004800000109011054, 55025480004800000109011053, 55025480004800000109011040, 55025480004800000109011041, 55025480004800000109011044, 55025480004800000109011052, 55025480004800000109011051, 55025480004800000109011068, 5502551600999990004031013, 5502551600999990004031017, 5502551600999990004031024, 5502551600999990004031031, 5502551600999990004031041, 5502551600999990004031030, 5502551600999990004031043, 5502551600999990109011038, 5502551600999990109011042, 5502551600999990109011078, 5502551600999990109011077, 5502551600999990109011043, 5502551600999990109011074, 5502551600999990109023000

**Last Mile Service Area Name:** 2  
**Community Name:** City of Middleton  
**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>
The rate of broadband subscribership for the proposed funded service area is 40% of households or less.

**Total Square Miles of Service Area:** 8  
**Total Population :** 20,043  
**Total Number of Households:** 8,626  
**Total Number of Businesses:** 862  
**Total Number of Critical Community Facilities, Anchor Institutions and Public Safety Entities:** 42

**Middle Mile Span Name:** East Washington Blvd.  
**Census Blocks in Middle Mile Span:** 5502548000480000017013000,  
5502548000480000017013009,  
5502548000480000017011007, 5502548000480000017013010,  
5502548000480000017011006, 5502548000480000017013011,



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

<b>Submitted Date:</b> 8/20/2009 4:54:51 PM	<b>Easygrants ID:</b> 3576
<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program	<b>Applicant Organization:</b> The Board of Regents of the University of Wisconsin System
<b>Task:</b> Submit Application - Infrastructure Programs	<b>Applicant Name:</b> Mr. Patrick Lee Christian

5502548000480000017011008, 5502548000480000017012011,  
5502548000480000017011009, 5502548000480000017012012,  
5502548000480000017011010, 5502548000480000017011011,  
5502548000480000017011017, 5502548000480000017011016,  
5502548000480000018003000, 5502548000480000018003004,  
5502548000480000018003005, 5502548000480000018003006,  
5502548000480000018003007, 5502548000480000018003012,  
5502548000480000018003019, 5502548000480000018003018,  
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5502548000480000018004008, 5502548000480000018004009,  
5502548000480000019005000, 5502548000480000019005002,  
5502548000480000019005011, 5502548000480000019005012,  
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5502548000480000021002015, 5502548000480000021002019,  
5502548000480000021002020, 5502548000480000021003006,  
5502548000480000021003007, 5502548000480000021004004,  
5502548000480000021003015, 5502548000480000021004007,  
5502548000480000021004018, 5502548000480000021004017,  
5502548000480000021004019, 5502548000480000025002000,  
5502548000480000025002003, 5502548000480000025002016,  
5502548000480000025002020, 5502548000480000025002021,  
5502548000480000025002012, 5502548000480000025002009,



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

<b>Submitted Date:</b> 8/20/2009 4:54:51 PM		<b>Easygrants ID:</b> 3576	
<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program		<b>Applicant Organization:</b> The Board of Regents of the University of Wisconsin System	
<b>Task:</b> Submit Application - Infrastructure Programs		<b>Applicant Name:</b> Mr. Patrick Lee Christian	

5502548000480000025002011, 5502548000480000025002010, 5502548000480000026011001, 5502548000480000026011000, 5502548000480000026011005, 5502548000480000026011006, 5502548000480000026012010, 5502548000480000026012011, 5502548000480000026012013, 5502548000480000026012014, 5502548000480000026021002, 5502548000480000026022010, 5502548000480000026021023, 5502548000480000026021024, 5502548000480000026021033, 5502548000480000026021032, 5502548000480000026021034, 5502548000480000026021035, 5502548000480000026021037, 5502548000480000026022013, 5502548000480000026031000, 5502548000480000026031004, 5502548000480000026031005, 5502548000480000026031006, 5502548000480000026031016, 5502548000480000026031015, 5502548000480000026031014, 5502548000480000026031013, 5502548000480000114002004, 5502548000480000114002008, 5502548000480000114002009, 5502548000480000114002012, 5502548000480000114002011, 5502548000480000114002010, 5502548000480000026021002, 5502548000480000026021003, 5502548000480000026031000, 5502548000480000114002004, 5502548000480000114002022, 5502548000480000114002012, 5502548000480000114002021, 5502548000480000114002038, 5502548000480000114002036, 5502548000480000114002039, 5502548000480000114002050

**Last Mile Service Area Name:** 3  
**Community Name:** City of Madison  
**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>
The rate of broadband subscribership for the proposed funded service area is 40% of households or less.

**Total Square Miles of Service Area:** 77  
**Total Population :** 15,166  
**Total Number of Households:** 7,567  
**Total Number of Businesses:** 1,109  
**Total Number of Critical Community Facilities, Anchor Institutions and Public Safety Entities:** 28



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

<b>Submitted Date:</b> 8/20/2009 4:54:51 PM		<b>Easygrants ID:</b> 3576	
<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program		<b>Applicant Organization:</b> The Board of Regents of the University of Wisconsin System	
<b>Task:</b> Submit Application - Infrastructure Programs		<b>Applicant Name:</b> Mr. Patrick Lee Christian	

**Middle Mile Span Name:** Northport Area

**Census Blocks in Middle Mile Span:** 5502548000480000022001001-5502548000480000022001002, 5502548000480000022001000, 5502548000480000022001007, 5502548000480000022001012-5502548000480000022001013, 5502548000480000022002000, 5502548000480000023012000-5502548000480000023012001, 5502548000480000024021013, 5502548000480000024022010, 5502548000480000024022008, 5502548000480000024022011, 5502548000480000024022013, 5502548000480000024021014, 5502548000480000024021015, 5502548000480000024021016, 5502548000480000024021017, 5502548000480000024022012, 5502548000480000024021020, 5502548000480000024021022, 5502548000480000024021023, 5502548000480000024021024, 5502548000480000024021025, 5502548000480000025001010, 5502548000480000025001009, 5502548000480000025001046, 5502548000480000025001045, 5502548000480000025001043, 5502548000480000025001042, 5502548000480000025001041, 5502548000480000025001040

**Last Mile Service Area Name:** 4  
**Community Name:** City of Madison  
**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>
The rate of broadband subscribership for the proposed funded service area is 40% of households or less.

**Total Square Miles of Service Area:** 77  
**Total Population :** 15,359  
**Total Number of Households:** 7,226  
**Total Number of Businesses:** 204  
**Total Number of Critical Community Facilities, Anchor Institutions and Public Safety Entities:** 21

**Middle Mile Span Name:** Northport Area



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

<b>Submitted Date:</b> 8/20/2009 4:54:51 PM		<b>Easygrants ID:</b> 3576	
<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program		<b>Applicant Organization:</b> The Board of Regents of the University of Wisconsin System	
<b>Task:</b> Submit Application - Infrastructure Programs		<b>Applicant Name:</b> Mr. Patrick Lee Christian	

**Census Blocks in Middle Mile Span:** 5502548000480000022001001-5502548000480000022001002, 5502548000480000022001000, 5502548000480000022001007, 5502548000480000022001012-5502548000480000022001013, 5502548000480000022002000, 5502548000480000023012000-5502548000480000023012001, 5502548000480000024021013, 5502548000480000024022010, 5502548000480000024022008, 5502548000480000024022011, 5502548000480000024022013, 5502548000480000024021014, 5502548000480000024021015, 5502548000480000024021016, 5502548000480000024021017, 5502548000480000024022012, 5502548000480000024021020, 5502548000480000024021022, 5502548000480000024021023, 5502548000480000024021024, 5502548000480000024021025, 5502548000480000025001010, 5502548000480000025001009, 5502548000480000025001046, 5502548000480000025001045, 5502548000480000025001043, 5502548000480000025001042, 5502548000480000025001041, 5502548000480000025001040

**Last Mile Service Area Name:** 4  
**Community Name:** Town of Burke  
**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>
The rate of broadband subscribership for the proposed funded service area is 40% of households or less.

**Total Square Miles of Service Area:** 15  
**Total Population :** 15,359  
**Total Number of Households:** 7,226  
**Total Number of Businesses:** 204  
**Total Number of Critical Community Facilities, Anchor Institutions and Public Safety Entities:** 21

**Middle Mile Span Name:** Monona Drive



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

<b>Submitted Date:</b> 8/20/2009 4:54:51 PM		<b>Easygrants ID:</b> 3576	
<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program		<b>Applicant Organization:</b> The Board of Regents of the University of Wisconsin System	
<b>Task:</b> Submit Application - Infrastructure Programs		<b>Applicant Name:</b> Mr. Patrick Lee Christian	

**Census Blocks in Middle Mile Span:** 5502548000480000019005012,  
5502548000480000019005013, 5502548000480000019001000, 5502548000480000019001004,  
5502548000480000019005018, 5502548000480000019005015,  
5502548000480000019001002, 5502548000480000019001003, 5502548000480000019005017,  
5502548000480000019005016, 5502548000480000019001012, 5502548000480000019001014,  
5502548000480000019001013, 5502548000480000020002017, 5502548000480000020002024,  
5502548000480000020002025, 5502548000480000020002026, 5502548000480000020002022,  
5502548000480000020004036, 5502548000480000020002023, 5502548000480000020002027,  
5502548000480000020003007, 5502548000480000020003008, 5502548000480000020003006,  
5502548000480000020003005, 5502548000480000020003004, 5502548000480000020004039,  
5502548000480000020003009, 5502548000480000020002028, 5502548000480000020003010,  
5502548000480000020003003, 5502548000480000020003012, 5502548000480000020003011,  
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5502548000480000020003000, 5502548000480000027002013, 5502548000480000027002014,  
5502548000480000027002015, 5502548000480000027002019, 5502548000480000027002020,  
5502548000480000027002030, 5502548000480000028001004, 5502548000480000028001005,  
5502548000480000028001014, 5502548000480000028002010, 5502548000480000028002011,  
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5502548000480000031003016, 5502548000480000031003018, 5502548000480000031003043,  
5502548000480000031003035, 5502548000480000031003034, 5502548000480000031003038,  
5502548000480000031003037, 5502548000480000031003039, 5502548000480000031003041,  
5502548000480000105001019, 5502548000480000114003076, 5502553675536750028002013,  
5502553675536750029002010, 5502553675536750029002011, 5502553675536750029003004,  
5502553675536750029003020, 5502553675536750029003006, 5502553675536750029003005,  
5502553675536750029003019, 5502553675536750103001000, 5502553675536750103001001  
5502553675536750103001002, 5502553675536750103001004, 5502553675536750103001005,  
5502553675536750103001013, 5502553675536750103001014, 5502553675536750103001015,  
5502553675536750103001025, 5502553675536750103001026, 5502553675536750104001000,  
5502553675536750104001008, 5502553675536750104001014, 5502553675536750104002000,  
5502553675536750104002013, 5502553675536750105001020, 5502553675536750105001021,  
5502508350999990031003044

**Last Mile Service Area Name:** 5  
**Community Name:** City of Madison  
**Rural Classification of the Community:** Non-Rural



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

<b>Submitted Date:</b> 8/20/2009 4:54:51 PM		<b>Easygrants ID:</b> 3576	
<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program		<b>Applicant Organization:</b> The Board of Regents of the University of Wisconsin System	
<b>Task:</b> Submit Application - Infrastructure Programs		<b>Applicant Name:</b> Mr. Patrick Lee Christian	

**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>
The rate of broadband subscribership for the proposed funded service area is 40% of households or less.

**Total Square Miles of Service Area:** 77  
**Total Population :** 13,205  
**Total Number of Households:** 6,119  
**Total Number of Businesses:** 867  
**Total Number of Critical Community Facilities, Anchor Institutions and Public Safety Entities:** 38

**Middle Mile Span Name:** Monona Drive

**Census Blocks in Middle Mile Span:** 5502548000480000019005012,  
5502548000480000019005013, 5502548000480000019001000, 5502548000480000019001004,  
5502548000480000019005018, 5502548000480000019005015,  
5502548000480000019001002, 5502548000480000019001003, 5502548000480000019005017,  
5502548000480000019005016, 5502548000480000019001012, 5502548000480000019001014,  
5502548000480000019001013, 5502548000480000020002017, 5502548000480000020002024,  
5502548000480000020002025, 5502548000480000020002026, 5502548000480000020002022,  
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5502548000480000020003005, 5502548000480000020003004, 5502548000480000020004039,  
5502548000480000020003009, 5502548000480000020002028, 5502548000480000020003010,  
5502548000480000020003003, 5502548000480000020003012, 5502548000480000020003011,  
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5502548000480000020003000, 5502548000480000027002013, 5502548000480000027002014,  
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5502548000480000027002030, 5502548000480000028001004, 5502548000480000028001005,  
5502548000480000028001014, 5502548000480000028002010, 5502548000480000028002011,



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

<b>Submitted Date:</b> 8/20/2009 4:54:51 PM		<b>Easygrants ID:</b> 3576	
<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program		<b>Applicant Organization:</b> The Board of Regents of the University of Wisconsin System	
<b>Task:</b> Submit Application - Infrastructure Programs		<b>Applicant Name:</b> Mr. Patrick Lee Christian	

5502548000480000028002014, 5502548000480000029001005, 5502548000480000029002012, 5502548000480000031003017, 5502548000480000031003015, 5502548000480000031003032, 5502548000480000031003016, 5502548000480000031003018, 5502548000480000031003043, 5502548000480000031003035, 5502548000480000031003034, 5502548000480000031003038, 5502548000480000031003037, 5502548000480000031003039, 5502548000480000031003041, 5502548000480000105001019, 5502548000480000114003076, 5502553675536750028002013, 5502553675536750029002010, 5502553675536750029002011, 5502553675536750029003004, 5502553675536750029003020, 5502553675536750029003006, 5502553675536750029003005, 5502553675536750029003019, 5502553675536750103001000, 5502553675536750103001001, 5502553675536750103001002, 5502553675536750103001004, 5502553675536750103001005, 5502553675536750103001013, 5502553675536750103001014, 5502553675536750103001015, 5502553675536750103001025, 5502553675536750103001026, 5502553675536750104001000, 5502553675536750104001008, 5502553675536750104001014, 5502553675536750104002000, 5502553675536750104002013, 5502553675536750105001020, 5502553675536750105001021, 5502508350999990031003044

**Last Mile Service Area Name:** 5  
**Community Name:** City of Monona  
**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>
The rate of broadband subscribership for the proposed funded service area is 40% of households or less.

**Total Square Miles of Service Area:** 3  
**Total Population :** 13,205  
**Total Number of Households:** 6,119  
**Total Number of Businesses:** 867  
**Total Number of Critical Community Facilities, Anchor Institutions and Public Safety Entities:** 38





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

<b>Submitted Date:</b> 8/20/2009 4:54:51 PM		<b>Easygrants ID:</b> 3576	
<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program		<b>Applicant Organization:</b> The Board of Regents of the University of Wisconsin System	
<b>Task:</b> Submit Application - Infrastructure Programs		<b>Applicant Name:</b> Mr. Patrick Lee Christian	

**Middle Mile Span Name:** Monona Drive

**Census Blocks in Middle Mile Span:** 5502548000480000019005012, 5502548000480000019005013, 5502548000480000019001000, 5502548000480000019001004, 5502548000480000019005018, 5502548000480000019005015, 5502548000480000019001002, 5502548000480000019001003, 5502548000480000019005017, 5502548000480000019005016, 5502548000480000019001012, 5502548000480000019001014, 5502548000480000019001013, 5502548000480000020002017, 5502548000480000020002024, 5502548000480000020002025, 5502548000480000020002026, 5502548000480000020002022, 5502548000480000020004036, 5502548000480000020002023, 5502548000480000020002027, 5502548000480000020003007, 5502548000480000020003008, 5502548000480000020003006, 5502548000480000020003005, 5502548000480000020003004, 5502548000480000020004039, 5502548000480000020003009, 5502548000480000020002028, 5502548000480000020003010, 5502548000480000020003003, 5502548000480000020003012, 5502548000480000020003011, 5502548000480000020003013, 5502548000480000020003044, 5502548000480000020003045, 5502548000480000020003000, 5502548000480000027002013, 5502548000480000027002014, 5502548000480000027002015, 5502548000480000027002019, 5502548000480000027002020, 5502548000480000027002030, 5502548000480000028001004, 5502548000480000028001005, 5502548000480000028001014, 5502548000480000028002010, 5502548000480000028002011, 5502548000480000028002014, 5502548000480000029001005, 5502548000480000029002012, 5502548000480000031003017, 5502548000480000031003015, 5502548000480000031003032, 5502548000480000031003016, 5502548000480000031003018, 5502548000480000031003043, 5502548000480000031003035, 5502548000480000031003034, 5502548000480000031003038, 5502548000480000031003037, 5502548000480000031003039, 5502548000480000031003041, 5502548000480000105001019, 5502548000480000114003076, 5502553675536750028002013, 5502553675536750029002010, 5502553675536750029002011, 5502553675536750029003004, 5502553675536750029003020, 5502553675536750029003006, 5502553675536750029003005, 5502553675536750029003019, 5502553675536750103001000, 5502553675536750103001001, 5502553675536750103001002, 5502553675536750103001004, 5502553675536750103001005, 5502553675536750103001013, 5502553675536750103001014, 5502553675536750103001015, 5502553675536750103001025, 5502553675536750103001026, 5502553675536750104001000, 5502553675536750104001008, 5502553675536750104001014, 5502553675536750104002000, 5502553675536750104002013, 5502553675536750105001020, 5502553675536750105001021, 5502508350999990031003044

**Last Mile Service Area Name:**  
**Community Name:**

5  
Town of Blooming Grove



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

<b>Submitted Date:</b> 8/20/2009 4:54:51 PM	<b>Easygrants ID:</b> 3576
<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program	<b>Applicant Organization:</b> The Board of Regents of the University of Wisconsin System
<b>Task:</b> Submit Application - Infrastructure Programs	<b>Applicant Name:</b> Mr. Patrick Lee Christian

**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>
The rate of broadband subscribership for the proposed funded service area is 40% of households or less.

**Total Square Miles of Service Area:** 6  
**Total Population :** 13,205  
**Total Number of Households:** 6,119  
**Total Number of Businesses:** 867  
**Total Number of Critical Community Facilities, Anchor Institutions and Public Safety Entities:** 38

**Middle Mile Span Name:** S. Park St.

**Census Blocks in Middle Mile Span:** 5502525950259500015021003,  
5502525950259500015021002, 5502548000480000011002004, 5502548000480000011002003,  
5502548000480000011002002, 5502548000480000011002000,  
5502548000480000011002005, 5502548000480000011002018, 5502548000480000011002017,  
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5502548000480000012002012, 5502548000480000012002019, 5502548000480000012002018,  
5502548000480000013001003, 5502548000480000013001002, 5502548000480000013001014,



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

<b>Submitted Date:</b> 8/20/2009 4:54:51 PM		<b>Easygrants ID:</b> 3576	
<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program		<b>Applicant Organization:</b> The Board of Regents of the University of Wisconsin System	
<b>Task:</b> Submit Application - Infrastructure Programs		<b>Applicant Name:</b> Mr. Patrick Lee Christian	

5502548000480000013002000, 5502548000480000013001015, 5502548000480000013002006, 5502548000480000013001021, 5502548000480000013001047, 5502548000480000013001048, 5502548000480000013001022, 5502548000480000013002007, 5502548000480000013001025, 5502548000480000013001042, 5502548000480000013001044, 5502548000480000013002012, 5502548000480000013001046, 5502548000480000014011001, 5502548000480000014011002, 5502548000480000014011003, 5502548000480000014011004, 5502548000480000014011006, 5502548000480000014011007, 5502548000480000014013000, 5502548000480000014013001, 5502548000480000014014003, 5502548000480000014014004, 5502548000480000014013002, 5502548000480000014013003, 5502548000480000014011010, 5502548000480000014013008, 5502548000480000014014012, 5502548000480000014014013, 5502548000480000014014014, 5502548000480000014014015, 5502548000480000014013026, 5502548000480000014014020, 5502548000480000014013028, 5502548000480000014011014, 5502548000480000014012000, 5502548000480000014012006, 5502548000480000014031000, 5502548000480000015022030, 5502548000480000015022031, 5502548000480000015022037, 5502548000480000015023015, 5502548000480000015023016, 5502548000480000016013000, 5502548000480000016013008, 5502548000480000016013006, 5502548000480000016013009, 5502548000480000016013010, 5502548000480000016021002, 5502548000480000016021001, 5502548000480000016021003, 5502548000480000016021000, 5502548000480000016023001, 5502548000480000016023000, 5502548000480000016021004, 5502548000480000016022007, 5502548000480000016021007, 5502548000480000016023002, 5502548000480000016023003, 5502548000480000016022008, 5502548000480000016023005, 5502548000480000016023004, 5502548000480000016021008, 5502548000480000016022013, 5502548000480000016022001, 5502548000480000016022000, 5502548000480000016022014, 5502548000480000016022019, 5502548000480000016022015, 5502548000480000017012012, 5502548000480000017012013, 5502548000480000017011001, 5502548000480000017011000, 5502548000480000017012016, 5502548000480000017012019, 5502548000480000017012017, 5502548000480000017012023, 5502548000480000017011017, 5502548000480000017012020, 5502548000480000017012022, 5502548000480000017011029, 5502548000480000017011021, 5502548000480000017011018, 5502548000480000017012021, 5502548000480000017011030, 5502548000480000017011022, 5502548000480000017011028, 5502548000480000017011020, 5502548000480000017011019, 5502548000480000017011023, 5502548000480000017011025, 5502548000480000017011027, 5502548000480000017011024, 5502548000480000017011026, 5502548000480000017011031, 5502548000480000017011034, 5502548000480000017011033, 5502548000480000017011032, 5502548025999990014011005, 5502548025999990014011008, 5502548025999990014011009, 5502548025999990014013007,



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<b>Task:</b> Submit Application - Infrastructure Programs	<b>Applicant Name:</b> Mr. Patrick Lee Christian

5502548025999990014011016, 5502548025999990014014011, 5502548025999990014013009, 5502548025999990014013024, 5502548025999990014013025, 5502548025999990014011023, 5502548025999990014011015, 5502548025999990014013027, 5502548025999990014011024, 5502548025999990014013037, 5502548025999990014011040, 5502548025999990014013034, 5502548025999990015021000, 5502548025999990015021001, 5502548025999990015023037

**Last Mile Service Area Name:** 6  
**Community Name:** City of Madison  
**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> The rate of broadband subscribership for the proposed funded service area is 40% of households or less.
--

**Total Square Miles of Service Area:** 77  
**Total Population :** 16,246  
**Total Number of Households:** 7,969  
**Total Number of Businesses:** 1,361  
**Total Number of Critical Community Facilities, Anchor Institutions and Public Safety Entities:** 21

**Middle Mile Span Name:** S. Park St.  
**Census Blocks in Middle Mile Span:** 5502525950259500015021003,  
5502525950259500015021002, 5502548000480000011002004, 5502548000480000011002003,  
5502548000480000011002002, 5502548000480000011002000,  
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5502548000480000011002026, 5502548000480000011002012, 5502548000480000011002013,  
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<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program	<b>Applicant Organization:</b> The Board of Regents of the University of Wisconsin System
<b>Task:</b> Submit Application - Infrastructure Programs	<b>Applicant Name:</b> Mr. Patrick Lee Christian

5502548000480000011002036, 5502548000480000012004000, 5502548000480000012001003, 5502548000480000012001000, 5502548000480000012004020, 5502548000480000012001004, 5502548000480000012004021, 5502548000480000012001005, 5502548000480000012002000, 5502548000480000012001006, 5502548000480000012002011, 5502548000480000012001007, 5502548000480000012002012, 5502548000480000012002019, 5502548000480000012002018, 5502548000480000013001003, 5502548000480000013001002, 5502548000480000013001014, 5502548000480000013002000, 5502548000480000013001015, 5502548000480000013002006, 5502548000480000013001021, 5502548000480000013001047, 5502548000480000013001048, 5502548000480000013001022, 5502548000480000013002007, 5502548000480000013001025, 5502548000480000013001042, 5502548000480000013001044, 5502548000480000013002012, 5502548000480000013001046, 5502548000480000014011001, 5502548000480000014011002, 5502548000480000014011003, 5502548000480000014011004, 5502548000480000014011006, 5502548000480000014011007, 5502548000480000014013000, 5502548000480000014013001, 5502548000480000014014003, 5502548000480000014014004, 5502548000480000014013002, 5502548000480000014013003, 5502548000480000014011010, 5502548000480000014013008, 5502548000480000014014012, 5502548000480000014014013, 5502548000480000014014014, 5502548000480000014014015, 5502548000480000014013026, 5502548000480000014014020, 5502548000480000014013028, 5502548000480000014011014, 5502548000480000014012000, 5502548000480000014012006, 5502548000480000014031000, 5502548000480000015022030, 5502548000480000015022031, 5502548000480000015022037, 5502548000480000015023015, 5502548000480000015023016, 5502548000480000016013000, 5502548000480000016013008, 5502548000480000016013006, 5502548000480000016013009, 5502548000480000016013010, 5502548000480000016021002, 5502548000480000016021001, 5502548000480000016021003, 5502548000480000016021000, 5502548000480000016023001, 5502548000480000016023000, 5502548000480000016021004, 5502548000480000016022007, 5502548000480000016021007, 5502548000480000016023002, 5502548000480000016023003, 5502548000480000016022008, 5502548000480000016023005, 5502548000480000016023004, 5502548000480000016021008, 5502548000480000016022013, 5502548000480000016022001, 5502548000480000016022000, 5502548000480000016022014, 5502548000480000016022019, 5502548000480000016022015, 5502548000480000017012012, 5502548000480000017012013, 5502548000480000017011001, 5502548000480000017011000, 5502548000480000017012016, 5502548000480000017012019, 5502548000480000017012017, 5502548000480000017012023, 5502548000480000017011017, 5502548000480000017012020, 5502548000480000017012022, 5502548000480000017011029, 5502548000480000017011021, 5502548000480000017011018, 5502548000480000017012021,



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<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program		<b>Applicant Organization:</b> The Board of Regents of the University of Wisconsin System	
<b>Task:</b> Submit Application - Infrastructure Programs		<b>Applicant Name:</b> Mr. Patrick Lee Christian	

5502548000480000017011030, 5502548000480000017011022, 5502548000480000017011028, 5502548000480000017011020, 5502548000480000017011019, 5502548000480000017011023, 5502548000480000017011025, 5502548000480000017011027, 5502548000480000017011024, 5502548000480000017011026, 5502548000480000017011031, 5502548000480000017011034, 5502548000480000017011033, 5502548000480000017011032, 5502548025999990014011005, 5502548025999990014011008, 5502548025999990014011009, 5502548025999990014013007, 5502548025999990014011016, 5502548025999990014014011, 5502548025999990014013009, 5502548025999990014013024, 5502548025999990014013025, 5502548025999990014011023, 5502548025999990014011015, 5502548025999990014013027, 5502548025999990014011024, 5502548025999990014013037, 5502548025999990014011040, 5502548025999990014013034, 5502548025999990015021000, 5502548025999990015021001, 5502548025999990015023037

**Last Mile Service Area Name:** 6  
**Community Name:** City of Fitchburg  
**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> The rate of broadband subscribership for the proposed funded service area is 40% of households or less.
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**Total Square Miles of Service Area:** 35  
**Total Population :** 16,246  
**Total Number of Households:** 7,969  
**Total Number of Businesses:** 1,361  
**Total Number of Critical Community Facilities, Anchor Institutions and Public Safety Entities:** 21

**Middle Mile Span Name:** S. Park St.  
**Census Blocks in Middle Mile Span:** 5502525950259500015021003,  
5502525950259500015021002, 5502548000480000011002004, 5502548000480000011002003,  
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<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program		<b>Applicant Organization:</b> The Board of Regents of the University of Wisconsin System	
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5502548000480000011002005, 5502548000480000011002018, 5502548000480000011002017, 5502548000480000011002008, 5502548000480000011002009, 5502548000480000011002010, 5502548000480000011002019, 5502548000480000011002016, 5502548000480000011002020, 5502548000480000011002011, 5502548000480000011002021, 5502548000480000011002015, 5502548000480000011002026, 5502548000480000011002012, 5502548000480000011002013, 5502548000480000011002014, 5502548000480000011002022, 5502548000480000011002035, 5502548000480000011002036, 5502548000480000012004000, 5502548000480000012001003, 5502548000480000012001000, 5502548000480000012004020, 5502548000480000012001004, 5502548000480000012004021, 5502548000480000012001005, 5502548000480000012002000, 5502548000480000012001006, 5502548000480000012002011, 5502548000480000012001007, 5502548000480000012002012, 5502548000480000012002019, 5502548000480000012002018, 5502548000480000013001003, 5502548000480000013001002, 5502548000480000013001014, 5502548000480000013002000, 5502548000480000013001015, 5502548000480000013002006, 5502548000480000013001021, 5502548000480000013001047, 5502548000480000013001048, 5502548000480000013001022, 5502548000480000013002007, 5502548000480000013001025, 5502548000480000013001042, 5502548000480000013001044, 5502548000480000013002012, 5502548000480000013001046, 5502548000480000014011001, 5502548000480000014011002, 5502548000480000014011003, 5502548000480000014011004, 5502548000480000014011006, 5502548000480000014011007, 5502548000480000014013000, 5502548000480000014013001, 5502548000480000014014003, 5502548000480000014014004, 5502548000480000014013002, 5502548000480000014013003, 5502548000480000014011010, 5502548000480000014013008, 5502548000480000014014012, 5502548000480000014014013, 5502548000480000014014014, 5502548000480000014014015, 5502548000480000014013026, 5502548000480000014014020, 5502548000480000014013028, 5502548000480000014011014, 5502548000480000014012000, 5502548000480000014012006, 5502548000480000014031000, 5502548000480000015022030, 5502548000480000015022031, 5502548000480000015022037, 5502548000480000015023015, 5502548000480000015023016, 5502548000480000016013000, 5502548000480000016013008, 5502548000480000016013006, 5502548000480000016013009, 5502548000480000016013010, 5502548000480000016021002, 5502548000480000016021001, 5502548000480000016021003, 5502548000480000016021000, 5502548000480000016023001, 5502548000480000016023000, 5502548000480000016021004, 5502548000480000016022007, 5502548000480000016021007, 5502548000480000016023002, 5502548000480000016023003, 5502548000480000016022008, 5502548000480000016023005, 5502548000480000016023004, 5502548000480000016021008, 5502548000480000016022013, 5502548000480000016022001, 5502548000480000016022000,



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<b>Funding Opportunity:</b> Broadband Initiatives Program and Broadband Technology Opportunities Program		<b>Applicant Organization:</b> The Board of Regents of the University of Wisconsin System	
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5502548000480000016022014, 5502548000480000016022019, 5502548000480000016022015, 5502548000480000017012012, 5502548000480000017012013, 5502548000480000017011001, 5502548000480000017011000, 5502548000480000017012016, 5502548000480000017012019, 5502548000480000017012017, 5502548000480000017012023, 5502548000480000017011017, 5502548000480000017012020, 5502548000480000017012022, 5502548000480000017011029, 5502548000480000017011021, 5502548000480000017011018, 5502548000480000017012021, 5502548000480000017011030, 5502548000480000017011022, 5502548000480000017011028, 5502548000480000017011020, 5502548000480000017011019, 5502548000480000017011023, 5502548000480000017011025, 5502548000480000017011027, 5502548000480000017011024, 5502548000480000017011026, 5502548000480000017011031, 5502548000480000017011034, 5502548000480000017011033, 5502548000480000017011032, 5502548025999990014011005, 5502548025999990014011008, 5502548025999990014011009, 5502548025999990014013007, 5502548025999990014011016, 5502548025999990014014011, 5502548025999990014013009, 5502548025999990014013024, 5502548025999990014013025, 5502548025999990014011023, 5502548025999990014011015, 5502548025999990014013027, 5502548025999990014011024, 5502548025999990014013037, 5502548025999990014011040, 5502548025999990014013034, 5502548025999990015021000, 5502548025999990015021001, 5502548025999990015023037

**Last Mile Service Area Name:** 6  
**Community Name:** Town of Madison  
**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>
The rate of broadband subscribership for the proposed funded service area is 40% of households or less.

**Total Square Miles of Service Area:** 1  
**Total Population :** 16,246  
**Total Number of Households:** 7,969  
**Total Number of Businesses:** 1,361  
**Total Number of Critical Community Facilities, Anchor Institutions and Public Safety Entities:** 21





**Broadband Infrastructure Application  
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## 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.