Broadband Infrastructure Application
Submission to NTIA – Broadband Technology Opportunities Program

Submitted Date: 3/25/2010 8:07:44 PM	**Easygrants ID: 4722**
Funding Opportunity: Broadband Technology Opportunities Program	**Applicant Organization:** MASSACHUSETTS TECHNOLOGY PARK
Task: Submit Application - BTOP	**Applicant Name:** Mr. Mitchell Lash Adams

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A. General Application Information

Applicant Information	
Name and Federal ID for Applicant	
DUNS Number	147368641
CCR # (CAGE)	5JN07
Legal Business Name	MASSACHUSETTS TECHNOLOGY PARK
Point of Contact (POC)	LISA ERLANDSON 5088700312 Ext. 1271 erlandson@masstech.org
Alternate POC	CHRISTOPHER ANDREWS 5088700312 Ext. andrews@masstech.org
Electronic Business POC	LISA ERLANDSON 5088700312 Ext. erlandson@masstech.org
Alternate Electronic Business POC	CHRIS ANDREWS 5088700312 Ext. andrews@masstech.org

Name and Contact Information of Person to be Contacted on Matters Involving this Application:	
Prefix	Mr.
First Name	Mitchell
Middle Name	Lash
Last Name	Adams
Suffix	
Telephone Number	508-870-0312

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Fax Number	508-898-9226
Email	adams@masstech.org
Title	Executive Director

Additional Contact Information of Person to be Contacted on Matters Involving this Application:

Project Role	Name	Phone	Email
Secondary Point of Contact	Judith A, Dumont	5088700312 1220	dumont@masstech.org
Other Contact	Lisa , Erlandson	5088700312	erlandson@masstech.org

Environmental Point of Contact

Prefix:
Name: Dumont, Judith
Suffix:
Telephone Number: 508-870-0312
Title: Director, Massachusetts Broadband Institute (MBI)

Organization Classification	
Type of Organization	State or State Agency
Is the organization a small business?	No
Does the organization meet the definition of a socially and economically disadvantaged small business concern?	No

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Authorized Organizational Representative	
AOR Name	Andrews, Christopher
Result	Applicant Authorized

Project Title and Project Description

Project Title: The Massachusetts Broadband Institute MassBroadband 123

Project Description: MBI's MassBroadband 123 builds an open access middle mile fiber network serving 123 western and north central Massachusetts communities, connecting local businesses to new customers, students to learning opportunities, and first responders to vital information. Completed within 2.5 years, this network provides the essential foundation for economic growth and stability to this distressed region.

CCI Priority Checklist

The following items were selected from the CCI Priority Checklist:

1. This project will deploy Middle Mile broadband infrastructure to community anchor institutions.

2. The project will deploy Middle Mile broadband infrastructure and has incorporated a public-private partnership among government, non-profit and for-profits entities, and other key community stakeholders.

3. This project will deploy Middle Mile broadband infrastructure in economically distressed areas.

4. This project will deploy Middle Mile broadband infrastructure to community colleges.

5. This project will deploy Middle Mile broadband infrastructure to public safety entities.

6. This project will deploy Middle Mile broadband infrastructure and either includes a Last Mile infrastructure component in unserved or underserved areas or has received commitments from one or more Last Mile broadband service providers to utilize the Middle Mile components. Any Last Mile components in rural areas do not exceed 20% of the total eligible costs of the project.

7. This project will deploy Middle Mile broadband infrastructure and the applicant has proposed to contribute 30 percent or more in non-federal cost match.

Comprehensive Community Infrastructure Components

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The following items were selected from the Comprehensive Community Infrastructure Components:

Middle Mile

BIP Applicants

Have you also applied to BIP for funding in the sample proposed funded service area?

- No

If Yes, please provide the project title and Easygrants ID number:
Title of Joint BIP Application:
Easygrants ID:

Other Applications

Is this application being submitted in coordination with any other application being submitted during this round of funding?

- No

Easygrants ID	Project Title

If YES, please explain any synergies and/or dependencies between this project and any other applications.

Individual Background Screening

Is the Applicant exempt from the Department of Commerce requirements regarding individual background screening in connection with any award resulting from this Application?

- Yes, Applicant is exempt because it is a unit of a state or local government

If the answer to the above question is "No," please identify each key individual associated with the Applicant who would be required to complete Form CD-346, "Applicant for Funding Assistance," in connection with any award resulting from this Application:

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Name	Title	Employer

B. Executive Summary, Project Purpose and Benefits

Essay Question

Executive Summary of the proposed project:

The Massachusetts Broadband Institute (MBI) is applying to NTIA for $45.4M in funds to add to the $26.2M in state matching funds to build MassBroadband 123 – a robust, open access, middle mile fiber network covering over one-third of the state. The 1,338 mile network will connect 123 communities in western MA and the 1,392 community anchor institutions (CAIs) that serve them. MassBroadband 123 is the transformative missing link to deliver comprehensive economic, educational and public safety benefits to this region hard hit by the national shift from manufacturing to a knowledge-based economy.

The MBI was created through the leadership of Governor Deval Patrick and the MA Legislature in 2008 to close the digital divide in Massachusetts. MassBroadband 123 is the result of more than a decade of efforts by state and local groups including the non-profit WesternMA Connect to bring adequate broadband infrastructure to the region. The largely rural region with low population density and difficult topology has many unserved and underserved communities. Commercial providers cannot achieve a viable return on their investment and state funds alone are insufficient to solve this problem. Federal funds are needed to augment state funds in order to build this much needed broadband infrastructure.

Supporting MBI's comprehensive community approach is a broad coalition that includes small towns and large cities, home-based businesses and multi-national companies, schools from kindergartens to community colleges and research universities, and healthcare facilities from small clinics to regional hospitals. The support also includes key partnerships with Public Safety and other state agencies providing valuable services to the communities. All agree that without

MassBroadband 123 the region will continue to suffer economic hardship and be stuck in the breakdown lane of the information superhighway.

The service area contains over one million residents, 44,300 businesses, 2,100 CAIs, and 3,429 square miles. The middle mile network will be within 3 miles of over 98% of the households, CAIs, and businesses. This will dramatically change the cost equation and service options for last mile providers and allow for competitively priced residential and business class broadband services. Eight last mile providers have indicated their intent to use the network.

Completed in just over 2 ½ years, MassBroadband 123 meets all the statutory purposes of the BTOP program. The service area covers all 4 unserved and 75 underserved census block groups. It contains 11 communities that meet the NOFA definition of Economically Disadvantaged Areas, and 69 state-defined Economic Target Areas. MassBroadband 123 will help to stimulate 2,975 jobs, 1,435 from building and managing the network and 1,540 from economic development in these disadvantaged areas and the rest of the region. The network will also directly connect most of the workforce development sites, and help vulnerable residents by serving over 125 public housing locations to help improve residents' access to broadband, and the skills and job opportunities it offers. The network will directly connect more than 65% of CAIs in the region including most public safety sites, K-12 schools, libraries, health care providers and all community colleges.

This project will unlock the potential of the region's residents and allow the CAIs to better serve them and provide for their well being, enabling community colleges to produce a highly skilled workforce, hospitals and doctors to exchange patient information and public safety officials to access key databases.

Education is the key to helping the region grow and prosper. Today colleges report many problems related to poor broadband, from high prices to inadequate service to difficulty in attracting quality staff due to lack of broadband in residential areas. MassBroadband 123, working with UMass MITI and others, will bring low cost high speed Internet access to educational institutions throughout the region. Our project will reach all 10 community college campuses, and over 360 K-12 schools, libraries, and other institutions of higher education that need better broadband to serve their communities.

MassBroadband 123 will also provide critical service upgrades for public safety. The state's Executive Office of Public Safety and Security (EOPSS) has 85 public safety locations with inadequate service and hundreds of other public safety facilities that have no access. Interoperability among agencies has gaps due to the lack of infrastructure to tie them together. New public safety applications are being deployed but without adequate bandwidth these sites won't be able to access them. EOPSS has partnered with MBI and is contributing $3.1M in matching funds to help solve this problem. Once completed, MassBroadband 123 will bring service one thousand times faster than their current service to 378 public safety locations in the region.

With advances in healthcare including electronic health records and tele-medicine citizens in the region are being left behind. MBI is partnering with its sister division, Mass e-Health Institute (MeHi) within the Massachusetts Technology Collaborative (MTC), which recently won two federal grants totaling $24M to deploy electronic medical records. MassBroadband 123 will connect all critical care hospitals in the region and over 40 other healthcare providers, bringing them secure connections that will greatly increase their ability to exchange health information with regional and other teaching hospitals in Massachusetts.

MassBroadband 123 is designed to offer the best possible value in terms of reaching citizens and businesses at the lowest possible cost. MBI is committed to the principles of openness, nondiscrimination and customer choice. Everything about MassBroadband 123—from technical standards to operating policies, from financial terms to physical location of facilities—reflects that commitment. The middle mile fiber optic network provides a number of resilient rings, carefully routed to maximize use of existing aerial rights-of-way to bring fiber close to CAIs, businesses and population centers through 22 interconnection points. It includes high strand counts and slack loops spaced frequently throughout the network to facilitate easy interconnection. It uses IRUs where possible to lower costs and avoid overbuild. The network will provide diverse routing sufficient to meet public safety's high availability requirements to multiple Internet Points of Presence (POP). The primary in-region POP is in Springfield, and additional POPs are reached through fiber obtained as IRUs from our partners NEREN (Northeast Research and Education Network) and UMass MITI.

MBI is a division of MTC, the state's technology economic development agency. MTC has a 28-year track record of successfully managing complex public/private programs, and has administered over $450M of public funds to stimulate economic development.

MBI has a strong team in place managed by a hands-on telecom leader who has successfully run an $87M division of a public company. The team includes a seasoned network program manager, project managers, advisors, and strategic partners. The Board includes MIT Professor David Clark, a father of the Internet, as well as the state's Telecommunications Commissioner and the state's CIO. MBI has also formed an Advisory Committee comprised of leading network experts to provide guidance on the network policies and management decisions. It will hire highly qualified network build contractors and a network operator through rigorous public procurement processes. The network operator will manage all elements of running the network from provisioning and monitoring to sales, billing and support.

The MBI team is currently completing the I-91 fiber deployment project. This project is an important component of MassBroadband 123 and was recently cited in the National Broadband Plan as a model for leveraging transportation projects to deploy broadband infrastructure.

The need for a high speed, middle mile broadband network is great, and the catalytic impact on the region will be profound. The MassBroadband 123 project is the only way to bridge the divide. Without federal funding, the region will continue to lack the single most essential tool to reverse its downward economic spiral. The MBI is uniquely positioned to begin building this network immediately.

Project purpose:

The purpose of MassBroadband 123 is to solve, once and for all, the longstanding problem of lack of high speed, affordable broadband in western Massachusetts. We cannot overstate the frustration of area businesses, residents, and CAIs who have tried for years to solve this problem. The household density and terrain of the proposed funded service area are such that private providers are unable to earn a sufficient return on investment.

MassBroadband 123 will solve the problem by bringing high-performance, middle mile broadband infrastructure to directly connect 1,392 community anchors, and routing high fiber count cable close to residents and businesses in all 123 communities in the service area. This infrastructure will significantly reduce the upfront costs of entry for last mile providers by making available lit and dark fiber enabling them to reach all the un/underserved communities.

Although the project supports all the BTOP statutory purposes, we focus this section on serving the unserved and underserved, improving public safety use of broadband, and supporting economic growth and job creation.

The proposed funded service area contains 4 unserved and 75 underserved census block groups. These are the only unserved areas and vast majority of underserved areas remaining in the state. There are 44 communities in the proposed funded service area that are either served by only 3G or by a monopoly landline broadband provider. This situation is unacceptable for businesses, residents, and CAIs in our service areas.

The MassBroadband 123 solution for un/underserved areas will reduce last mile providers' required capital and backhaul costs. The network is designed to pass within 3 miles of at least 98% of all households, businesses and anchor institutions in the service area. This will enable the last mile providers to offer affordable broadband service to all 123 communities, including the remaining unserved or underserved. We have received 8 letters from ISPs supporting this project and indicating their intent to use the network to deliver broadband to areas they could not previously afford to reach.

Public safety agencies in the service area have inadequate or no broadband communications access which handcuff officials from effectively communicating and sharing vital information. Police stations must rely on expensive, low speed 56kpbs connections to the state's Criminal Justice Information System (CJIS). In fact, 27 stations have no connection at all. This limited access prevents these departments from investigating suspects while in the field or sitting at the station. Public Safety Answering Points in our service area cannot upgrade to next generation 911 service, which requires high bandwidth to support sharing of text and video.

Municipal fire departments and emergency management personnel have no connection to the state data network where they can receive and exchange important information regarding emergency information such as hazardous material spills and homeland security information. Dispatch and coordination of emergency personnel is impaired because there is no high speed middle mile infrastructure to tie radio systems together. Neither the Commonwealth nor the municipalities have the financial resources to upgrade these significant deficiencies without the MassBroadband 123 project.

The MassBroadband 123 solution comprehensively addresses these issues faced by the public safety community by creating a guaranteed-bandwidth public safety network that will interconnect the majority of municipal police, fire and emergency management sites. The network will provide a connection to these agencies that is 1000X times faster than today's circuits, thus enabling these departments to use more advanced investigative and public safety tools. The network will directly connect 378 public safety sites. Sites not being connected are either unmanned or already have appropriate connections. Critical communication sites will be upgraded to improve quality, redundancy, and reach of the regional emergency radio and 911 communications. This upgrade will make interoperability possible, significantly improving public safety responsiveness, coordination and effectiveness.

The communities in the service area have struggled to grow jobs and increase population over the past 15 years. The region once had thriving manufacturing and paper industries most of which have moved out of state or overseas. Workforce development agencies all recognize the need to upgrade their training programs and that improved broadband access is a critical requirement for many of these programs. This lack of broadband infrastructure also prevents many of the graduates from the area's world-class colleges from finding work in the region. Despite more than 100,000 undergraduate and graduate students, most of these students leave to take jobs in New York or Boston, contributing to the continued population decline. The MA Office of Small Business and Entrepreneurship considers the majority of our service area unsuitable to support new small businesses that need reliable broadband infrastructure.

The MassBroadband 123 solution will dramatically change the economic development dynamic by bringing fiber within 3 miles of 99% of area businesses and directly connecting all the community colleges and most workforce development agencies. The network will provide the foundation to attract new businesses to the area and help existing ones grow. The project will bring broadband access to 11 NTIA defined economically distressed areas, and 69 communities designated by the state as Economic Target Areas, and will connect to 128 public housing sites to provide vulnerable residents with an important tool to find and compete for jobs. The project is forecast to add at least 2,975 jobs to the area.

Recovery Act and Other Governmental Collaboration:

MassBroadband 123 will collaborate with a number of federal and state programs.

Along I-91 in western MA, MBI is collaborating with MassDOT to install 55 miles of fiber optic cable with 34 interconnection points for economic development as part of a $38M ($27M federal funds) Intelligent Traffic System (ITS) project. MBI used state funds to extend the ITS system to the VT border and install a cable as part of MassDOT's construction. MBI and MassDOT are working on an agreement to enable MBI to utilize MassDOT rights of way for broadband deployment and enable MassDOT to request ITS capabilities as part of any new MBI build. This collaboration was recently cited in the National Broadband Plan as an exemplary way to reduce cost and speed up broadband implementation.

MassBroadband 123 will provide infrastructure for several government-funded public safety projects in the region including (1) backbone to reach 378 additional police, fire, and emergency management anchors in the region so they can participate in the $21M DHS Public Safety Interoperable Communications Grant Program (2) redundancy and backhaul for a $36M 800 Mhz project to upgrade state police radio systems in western MA to a digital switched network and (3) high-speed network connectivity to all western MA public safety answering points that are migrating to next generation 911 as part of a $38M program funded from state E911 fees.

MassBroadband 123 will serve as a foundation for 2 recent federal healthcare grants. MTC's MA e-Health Institute (MeHI) received $13.4M ARRA grant to be the state-designated Regional Extension Center, a program to help primary care providers in small group practices implement and use certified electronic health records per the HITECH Act. MeHI also received a $10.6M ARRA grant to create an interoperable health information exchange. This program will create a mechanism for providers to electronically exchange health information. MBI and MeHI are collaborating to ensure success through joint outreach and educational programs regarding these grants and the importance of broadband. The teams will identify and prioritize healthcare providers for network implementation and the teams will collaborate on finding ways to get service to those providers who aren't initially connected.

MBI will interconnect with OpenCape and ION, two BTOP Round 1 winners. The OpenCape interconnection will be in Providence and the ION Interconnection will happen at the MA/NY border.

Fit with BTOP CCI Priorities:

MBI's MassBroadband 123 project fits all BTOP CCI priorities.

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1) MassBroadband 123's middle mile network has been carefully routed to comprehensively meet the needs of the 123 communities in the service area, passing close to CAIs, businesses and residences. The network will directly connect 1,392 community anchor institutions (CAIs) and 730 more CAIs can connect through commercial ISPs utilizing MassBroadband 123. The decade of effort by WesternMA Connect and the many included letters demonstrate the need and demand for the network. While it was impractical to get letters from all CAIs, we received letters from parent organizations, associations, and partners expressing the need. 1065 key CAI locations are reached with 315.3 miles of laterals, while reaching 327 additional CAIs whose need is unconfirmed needed only 7.4 miles of added laterals, about 120 feet per CAI.

2) MBI is closely partnered with non-profit WesternMA Connect, which promotes bringing high-capacity broadband services to western MA, for community outreach. MBI partnered with non-profits NEREN and Northern Crossroads, and UMass MITI to provide diverse routes to points of interest in Boston and key educational and medical resources. MBI also has a close partnership with the Massachusetts Executive Office of Public Safety and Security (EOPSS) and the MA IT Division to provide service to most public safety and key state agencies in the region.

3) The MBI project will bolster economic development by bringing fiber within 3 miles of 99% of area businesses and directly connecting all the community colleges and most workforce development agencies. The project will bring broadband access to 11 NTIA defined economically distressed areas, and 69 designated by the state as Economic Target Areas containing over 32,500 businesses. It connects 128 public housing sites which will provide vulnerable residents with job-seeking tools. The project is forecast to add at least 2,975 jobs to the area.

4) Community colleges in the area lack the funds for high-speed access to the Internet and any access to Internet2. UMass MITI describes the challenges it faces in western MA in its letter. MassBroadband 123 will provide connections to substantially improve broadband to meet the networking needs described by all 10 community college campuses in western MA in the letters submitted with this application.

5) MassBroadband 123's partnership with EOPSS ensures the network addresses needs they are otherwise unable to fulfill despite years of effort. The project is committed to serve over 375 public safety locations and provide fiber connections to radio sites to improve emergency

communications. EOPSS speaks to the needs of all public safety in the state and intends to buy services for all connected locations.

6) MBI has received non-binding intent letters (included) from 8 ISPs serving the area. All indicate they plan to use the MassBroadband 123 network to substantially improve last mile services to residents in unserved and underserved areas.

7) MBI will match $26.2M, a rate of 36.5%. The cash match rate is 32.2%.

Is the applicant seeking a waiver of the Buy American provision pursuant to section x.Q of the NOFA?

- No

Is the applicant deliquent on any federal debt?

- No

If Yes, justification for deliquency:

Are you seeking a waiver of any requirement set forth in the NOFA that is not mandated by statute or applicable law?

- No

Is the applicant a current recipient of a grant or loan from RUS?

- No

C. Partners

Are you partnering with any other key institutions, organizations, or other entities for this project?

- Yes

If YES, key partners are listed below:

Project Role: Third party in-kind contributor
Name: Dubendorf, Don
Phone: 4134969606
Email: ddubendorf@dubendorf-law.com
Address 1: 75 South Church Street
Address 2:

Address 3: City: Pittsfield State: Massachusetts Zip Code: 01201 Organization: WesternMA Connect Organization Type: Non-profit Institution Small business: No Socially and economically disadvantaged small business concern: No
Project Role: Third party in-kind contributor Name: Dunlavy, Linda Phone: 4137743167 Email: lindad@frcog.org Address 1: 425 Main Street, Suite 20 Address 2: Address 3: City: Greenfield State: Massachusetts Zip Code: 01301-3313 Organization: Western Massachusetts Planning Agencies Organization Type: Non-profit Corporation Small business: No Socially and economically disadvantaged small business concern: No
Project Role: Third party in-kind contributor Name: Loftus, George Phone: 4018860887 Email: george.loftus@oshean.org Address 1: 6946 Post Road Address 2: Address 3: City: North Kingstown State: Rhode Island Zip Code: 02852 Organization: Northeast Reaerch and Education Network Organization Type: Non-profit Corporation Small business: No Socially and economically disadvantaged small business concern: No
Project Role: Third party in-kind contributor Name: Poole, Michael Phone: 5088562083

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Email: mpoole@umassp.edu
Address 1: 333 South Street
Address 2:
Address 3:
City: Shrewsbury
State: Massachusetts
Zip Code: 01545-4169
Organization: Massachusetts Information Turnpike Initiative
Organization Type: State or State Agency
Small business: No
Socially and economically disadvantaged small business concern: No

Project Role: Third party in-kind contributor
Name: Margulies, Anne
Phone: 6176264400
Email: anne.margulies@state.ma.us
Address 1: 1 Ashburton Place
Address 2:
Address 3:
City: Boston
State: Massachusetts
Zip Code: 02108
Organization: Information Technology Division
Organization Type: State or State Agency
Small business: No
Socially and economically disadvantaged small business concern: No

Project Role: Third party in-kind contributor
Name: Grossman, John
Phone: 6177273200
Email: john.grossman@state.ma.us
Address 1: 1 Ashburton Place
Address 2:
Address 3:
City: Boston
State: Massachusetts
Zip Code: 02108
Organization: Executive Office of Public Safety and Security
Organization Type: State or State Agency
Small business: No
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Project Role: Third party in-kind contributor Name: McGee, Stan Phone: 6177883610 Email: stan.mcgee@state.ma.us Address 1: 1 Ashburton Place Address 2: Address 3: City: Boston State: Massachusetts Zip Code: 02108 Organization: Executive Office of Housing and Community Development Organization Type: State or State Agency Small business: No Socially and economically disadvantaged small business concern: No
Project Role: Third party in-kind contributor Name: Stegemann, Al Phone: 6179737000 Email: al.stegemann@state.ma.us Address 1: 10 Park Plaza Address 2: Address 3: City: Boston State: Massachusetts Zip Code: 02116 Organization: Mass Department of Transportation Organization Type: State or State Agency Small business: No Socially and economically disadvantaged small business concern: No

Description of the involvement of the partners listed above in the project.

The MBI has many established and newly-formed partnerships that will ensure swift success of MassBroadband 123. Partnering is a core strategy for MBI and as a public entity is a natural way of doing business.

Our partners represent a broad range of local community organizations, state agencies, and non-profits. Collectively they are contributing $6.2M in matching cash, access to existing broadband infrastructure and state owned land and rights of way, synergies with other ARRA funded

projects and commitments to work with the MBI on broadband related outreach and economic development.

(1) Local Community and Small/Disadvantaged Business Partners:
For over a decade, WesternMA Connect, Inc., a regional non-profit, has led efforts to provide high capacity broadband services throughout Berkshire, Franklin, Hampden and Hampshire counties. The WMC, along with the Berkshire Regional Planning Commission, Franklin Regional Council of Governments and the Pioneer Valley Planning Commission, are partnering with MBI to reach out to the 123 cities and towns in the project footprint. They will provide assistance with community outreach, development of a municipal tool kit, planning and permitting, and organizational support. They are also MBI's planning partner for our Broadband Data Improvement Act grant.

MBI plans to partner with the state Latino and the New England Black Chambers of Commerce to identify businesses that are disadvantaged and operate in economically distressed areas. Together we will work to develop products, services and programming that will drive broadband adoption and contribute to the success of SDB's in our project area.

MBI worked with a number of small businesses in preparation of this application (see supplemental info) and contractors to the state are encouraged to use SDBs.

(2) State Partners:
The Executive Office of Public Safety and Security (EOPSS) oversees law enforcement and public safety entities. EOPSS is contributing $3.1M in matching funds and is partnering with MBI to replace its aging 56k frame relay network and to prepare for Next Generation 911 and 800Mhz radio deployments.

The Information Technology Division (ITD) is investing $3.1M in capital to ensure the network is constructed and available for all state agencies in the region that provide service to the communities. In addition to its capital contribution and use of the network, ITD will assist MBI with network expertise and selecting a network operator.

The Department of Conservation and Recreation manages over 400,000 acres of parks and preserved land in MA. MBI and DCR have executed an MOU for access to DCR rights of way for broadband deployment.

The Department of Transportation (MassDOT) is partnering with MBI to facilitate the 55 mile, I-91 fiber build and to enable MBI to use other highway rights of way for broadband deployment.

The Executive Office of Housing and Economic Development (EOHED) supports MBI by conducting legislative and interagency outreach and research. Assistant Secretary Stan McGee serves as the Chair of the MBI Board.

The Commonwealth will receive discounted wholesale rates for network services, higher minimum bandwidth guarantees, and IRU reservations to cover all state agencies in recognition of their capital and expertise contributions. They will be able to connect with many CAIs in western MA for the first time and will save money while increasing service to their customers.

(3) Academic Partners:
University of Massachusetts (UMass) MITI will be partnering with MBI to leverage existing fiber that will provide a long-term route from Ayer to Boston and give MBI a path-diverse, redundant leg into major peering points in Boston. UMass MITI has long been acting as an ISP and Internet2 SEGP for K-12 schools and community and state colleges. Partnership with MBI will enable them to provide faster service for less cost in currently unserved and economically distressed areas.

Northeast Research and Education Network (NEREN), a non-profit consortium of research and education organizations in New England and New York, will partner with MBI to provide a 10 GB lit lambda service on their redundant New England fiber ring. NEREN will interconnect MBI's CAIs with other CAIs and will provide transport to critical peering points in Boston and around New England, including eventual cross-connection with OpenCape in Providence.

The Northern Crossroads GigaPOP (NoX) serves as the peering point for all major research and education institutions in New England. Universities, hospitals, schools, libraries and government agencies all utilize the NoX to connect to each other and to connect to national and global networks such as Internet2. NoX is partnering with MBI to provide interconnection and transport for our community anchors to these advanced networking resources.

(4) e-Health and Regional Health Care:

MTC's Massachusetts e-Health Institute (MeHI) is the state's entity responsible for advancing the dissemination of health information technology across the Commonwealth. MeHI is deploying electronic health records systems to all networked healthcare providers through a statewide health information exchange. MeHI has already received $24M in ARRA grants and is partnering with MB123 because the 139 healthcare providers in the region do not have the bandwidth they need to share electronic records. MeHI cannot develop the hospitals of the future without this project to connect them.

(5) Other Network Providers:
MBI will partner with Holyoke Gas and Electric and the Springfield Media Telecommunications Group to leverage their existing fiber and conduit assets in connecting to community anchors in economically distressed areas in Holyoke and Springfield. MBI will partner with OpenCape to interconnect the two MA networks, bringing together CAIs and public safety from both regions of the Commonwealth.

D. Congressional Districts

Applicant Headquarters

- Massachusetts

Project Service States

Massachusetts

Project Service Areas

Massachusetts - 1

Massachusetts - 2

Massachusetts - 3

Massachusetts - 5

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Will any portion of your proposed project serve federally recognized tribal entities?

- No

Indicate each federally recognized tribal entity your proposed project will serve.

Have you consulted with each of the federally recognized tribal entities identified above?

- No

E. Service Area Details

Is the applicant seeking a waiver for providing less than 100% coverage of a service area?

- No

Project Details

Service Area Type: Middle Mile
Service Area Name: MB123 Service Area 01
Rural Classification of the Last Mile Service Area: Rural
Service Status of the Last Mile Service Area: Unserved

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

Total Square Miles in Service Area: 71
Total Population in Proposed Service Area: 1,575
Total Number of Households in Service Area: 613
Total Number of Businesses in Service Area: 72
Total Number of Community Anchor Institutions and Public Safety Entities in Proposed Funded Service Area: 11
Unemployment Rate in the Service Area: 10

Median Income in the Service Area: **46,845**
Estimated Percentage of Households with Access to Broadband: **7**
Estimated Percentage of Households Subscribing to Broadband:

Service Area Type: Middle Mile
Service Area Name: MB123 Service Area 02
Rural Classification of the Last Mile Service Area: Rural
Service Status of the Last Mile Service Area: Unserved

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

Total Square Miles in Service Area: **54**
Total Population in Proposed Service Area: **1,515**
Total Number of Households in Service Area: **627**
Total Number of Businesses in Service Area: **264**
Total Number of Community Anchor Institutions and Public Safety Entities in Proposed Funded Service Area: **9**
Unemployment Rate in the Service Area: **5**
Median Income in the Service Area: **46,359**
Estimated Percentage of Households with Access to Broadband: **6**
Estimated Percentage of Households Subscribing to Broadband:

Service Area Type: Middle Mile
Service Area Name: MB123 Service Area 03
Rural Classification of the Last Mile Service Area: Rural
Service Status of the Last Mile Service Area: Underserved

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 in Service Area: **246**

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Total Population in Proposed Service Area: **15,585**
Total Number of Households in Service Area: **6,424**
Total Number of Businesses in Service Area: **2,145**
Total Number of Community Anchor Institutions and Public Safety Entities in Proposed Funded Service Area: **60**
Unemployment Rate in the Service Area: **8**
Median Income in the Service Area: **47,399**
Estimated Percentage of Households with Access to Broadband: **90**
Estimated Percentage of Households Subscribing to Broadband: **39**

Service Area Type: Middle Mile
Service Area Name: MB123 Service Area 04
Rural Classification of the Last Mile Service Area: Rural
Service Status of the Last Mile Service Area: Underserved

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 in Service Area: **890**
Total Population in Proposed Service Area: **43,016**
Total Number of Households in Service Area: **16,907**
Total Number of Businesses in Service Area: **3,689**
Total Number of Community Anchor Institutions and Public Safety Entities in Proposed Funded Service Area: **262**
Unemployment Rate in the Service Area: **8**
Median Income in the Service Area: **48,617**
Estimated Percentage of Households with Access to Broadband: **88**
Estimated Percentage of Households Subscribing to Broadband: **39**

Service Area Type: Middle Mile
Service Area Name: MB123 Service Area 05
Rural Classification of the Last Mile Service Area: Rural
Service Status of the Last Mile Service Area: Underserved

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

Total Square Miles in Service Area: **161**
Total Population in Proposed Service Area: **5,106**
Total Number of Households in Service Area: **1,977**
Total Number of Businesses in Service Area: **494**
Total Number of Community Anchor Institutions and Public Safety Entities in Proposed Funded Service Area: **45**
Unemployment Rate in the Service Area: **9**
Median Income in the Service Area: **44,359**
Estimated Percentage of Households with Access to Broadband: **48**
Estimated Percentage of Households Subscribing to Broadband: **23**

Service Area Type: Middle Mile
Service Area Name: MB123 Service Area 06
Rural Classification of the Last Mile Service Area: Rural
Service Status of the Last Mile Service Area: Underserved

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

Total Square Miles in Service Area: **181**
Total Population in Proposed Service Area: **6,283**
Total Number of Households in Service Area: **2,400**
Total Number of Businesses in Service Area: **435**
Total Number of Community Anchor Institutions and Public Safety Entities in Proposed Funded Service Area: **40**
Unemployment Rate in the Service Area: **7**
Median Income in the Service Area: **54,811**
Estimated Percentage of Households with Access to Broadband: **43**
Estimated Percentage of Households Subscribing to Broadband: **2**

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Service Area Type: Middle Mile
Service Area Name: MB123 Service Area 07
Rural Classification of the Last Mile Service Area: Rural
Service Status of the Last Mile Service Area: Underserved

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 in Service Area: 143
Total Population in Proposed Service Area: 5,837
Total Number of Households in Service Area: 2,142
Total Number of Businesses in Service Area: 422
Total Number of Community Anchor Institutions and Public Safety Entities in Proposed Funded Service Area: 15
Unemployment Rate in the Service Area: 11
Median Income in the Service Area: 49,666
Estimated Percentage of Households with Access to Broadband: 82
Estimated Percentage of Households Subscribing to Broadband: 39

Service Area Type: Middle Mile
Service Area Name: MB123 Service Area 08
Rural Classification of the Last Mile Service Area: Rural
Service Status of the Last Mile Service Area: Served

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

Total Square Miles in Service Area: 89
Total Population in Proposed Service Area: 30,489
Total Number of Households in Service Area: 12,457
Total Number of Businesses in Service Area: 1,020
Total Number of Community Anchor Institutions and Public Safety Entities in Proposed Funded Service Area: 79
Unemployment Rate in the Service Area: 10
Median Income in the Service Area: 35,412
Estimated Percentage of Households with Access to Broadband: 100

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Estimated Percentage of Households Subscribing to Broadband: 53

Service Area Type: Middle Mile
Service Area Name: MB123 Service Area 09
Rural Classification of the Last Mile Service Area: Non-Rural
Service Status of the Last Mile Service Area: Served

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

Total Square Miles in Service Area: 211
Total Population in Proposed Service Area: 76,496
Total Number of Households in Service Area: 32,255
Total Number of Businesses in Service Area: 3,151
Total Number of Community Anchor Institutions and Public Safety Entities in Proposed Funded Service Area: 225
Unemployment Rate in the Service Area: 9
Median Income in the Service Area: 41,616
Estimated Percentage of Households with Access to Broadband: 100
Estimated Percentage of Households Subscribing to Broadband: 54

Service Area Type: Middle Mile
Service Area Name: MB123 Service Area 10
Rural Classification of the Last Mile Service Area: Rural
Service Status of the Last Mile Service Area: Served

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

Total Square Miles in Service Area: 119
Total Population in Proposed Service Area: 31,010
Total Number of Households in Service Area: 13,249
Total Number of Businesses in Service Area: 1,209
Total Number of Community Anchor Institutions and Public Safety Entities in Proposed Funded Service Area: 128
Unemployment Rate in the Service Area: 10
Median Income in the Service Area: 37,048

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Estimated Percentage of Households with Access to Broadband: **99**
Estimated Percentage of Households Subscribing to Broadband: **53**

Service Area Type: Middle Mile
Service Area Name: MB123 Service Area 11
Rural Classification of the Last Mile Service Area: Rural
Service Status of the Last Mile Service Area: Underserved

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 in Service Area: **36**
Total Population in Proposed Service Area: **3,347**
Total Number of Households in Service Area: **1,170**
Total Number of Businesses in Service Area: **180**
Total Number of Community Anchor Institutions and Public Safety Entities in Proposed Funded Service Area: **9**
Unemployment Rate in the Service Area: **7**
Median Income in the Service Area: **80,400**
Estimated Percentage of Households with Access to Broadband: **92**
Estimated Percentage of Households Subscribing to Broadband: **36**

Service Area Type: Middle Mile
Service Area Name: MB123 Service Area 12
Rural Classification of the Last Mile Service Area: Non-Rural
Service Status of the Last Mile Service Area: Served

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

Total Square Miles in Service Area: **296**
Total Population in Proposed Service Area: **158,175**
Total Number of Households in Service Area: **61,282**
Total Number of Businesses in Service Area: **6,450**

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Total Number of Community Anchor Institutions and Public Safety Entities in Proposed Funded Service Area: **175**
Unemployment Rate in the Service Area: **12**
Median Income in the Service Area: **43,669**
Estimated Percentage of Households with Access to Broadband: **100**
Estimated Percentage of Households Subscribing to Broadband: **56**

Service Area Type: Middle Mile
Service Area Name: MB123 Service Area 13
Rural Classification of the Last Mile Service Area: Rural
Service Status of the Last Mile Service Area: Served

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

Total Square Miles in Service Area: **45**
Total Population in Proposed Service Area: **5,109**
Total Number of Households in Service Area: **1,888**
Total Number of Businesses in Service Area: **237**
Total Number of Community Anchor Institutions and Public Safety Entities in Proposed Funded Service Area: **7**
Unemployment Rate in the Service Area: **11**
Median Income in the Service Area: **51,070**
Estimated Percentage of Households with Access to Broadband: **97**
Estimated Percentage of Households Subscribing to Broadband: **57**

Service Area Type: Middle Mile
Service Area Name: MB123 Service Area 14
Rural Classification of the Last Mile Service Area: Non-Rural
Service Status of the Last Mile Service Area: Served

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

Total Square Miles in Service Area: **889**
Total Population in Proposed Service Area: **617,729**
Total Number of Households in Service Area: **235,014**

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Total Number of Businesses in Service Area: **24,538**
Total Number of Community Anchor Institutions and Public Safety Entities in Proposed Funded Service Area: **1,056**
Unemployment Rate in the Service Area: **10**
Median Income in the Service Area: **43,383**
Estimated Percentage of Households with Access to Broadband: **100**
Estimated Percentage of Households Subscribing to Broadband: **55**

F. Community Anchor Summary

Community Anchor Summary	
Schools (k-12)	473
Libraries	180
Medical and Healthcare Providers	323
Public Safety Entities	495
Community Colleges	10
Public Housing	128
Other Institutions of Higher Education	29
Other Community Support Organization	36
Other Government Facilities	447
TOTAL COMMUNITY ANCHOR INSTITUTIONS	**2121**
Historically Black colleges and Universities	0
Tribal Colleges and	0

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Universities	
Alaska Native Serving Institutions	0
Hispanic Serving Institutions	0
Native Hawaiian Serving Institutions	0
TOTAL MINORITY SERVING INSTITUTIONS	**0**

G. Project Benefits

Demographics

Jobs	
How many direct jobs-years will be created from this project?	420
How many indirect jobs will be created from this project?	348
How many jobs will be induced from this project?	2207

Methodology used to estimate jobs:

The project will create or induce 2,975 job-years, comprised of 1,435 job-years from the implementation and operation of the network, plus an additional 1,540 job-years from economic development resulting from use of the network.

According to research published by Dr. Raul Katz of Columbia Business School in February 2009, each $50k of stimulus spending creates a job-year. This job-year creation is split between direct, indirect, and induced jobs, with 1 direct job creating 0.83 indirect job-years and 1.59 induced job-years. Our proposed $72M budget will result in 420 direct job-years, 348 indirect job-years, and 667 directly induced job-years for a total of 1,435 from implementation and operation of the network. In addition, Dr. Katz estimates that network effects associated with broadband infrastructure deployment will add approximately 3.7 incremental induced job-years for each direct job-year added. This leads to an additional 1,540 job-years in network effects, which we include in the total induced number above.

We use Katz instead of the Council of Economic Advisors, because we believe it comprehensively accounts for the incremental economic development benefits associated with

the deployment of broadband infrastructure. While Dr. Katz estimates $50k/combined direct, indirect, and induced job-year created, his estimate for direct and indirect jobs is roughly equivalent to the CEA's $92k/job-year created.

Project Impact:

The lack of broadband infrastructure is restraining innovation and business development in the 123 cities and towns of our service area. Some may presume that all of Massachusetts is like Boston, a high tech hub of innovation. However, the residents of the service area know this is far from the truth. The state's innovation-based economy has left them behind as they have continued to struggle with severe economic hardship during the past two decades.

MassBroadband 123 in partnership with last mile providers will remedy this problem and have an immediate and profound impact on this area. The open access, middle mile network will unlock the economic potential of the region, connect police stations to important databases, enable hospitals and doctors to exchange patient information, and help community colleges produce the trained workforce necessary for success in a 21st century economy. For the first time, large and small businesses will have access to affordable commercial-grade services and their employees will be able to work remotely.

Comprehensively Meeting the Community Needs

MassBroadband 123 will initially directly connect 1,392 public safety, education, healthcare, and other CAIs. Over 1 million citizens and 44k businesses located in the 123 communities will directly benefit from this project. 1065 of the connected CAI locations have expressed, explicitly or through their parent organization, intent to purchase services from the network. The remaining 327 additional CAIs whose need is unconfirmed require only 7.4 miles of additional laterals.

Improving Public Safety: MassBroadband 123 will change how public safety services functions in the area. It will provide high speed connections to more than 378 police, fire, and emergency management facilities. The project will provide 27 police stations and twenty-one 911 public safety answering points with access to broadband for the first time and will upgrade 85 additional stations from an impractical 56kbps connection, in which they cannot even view mug shots. These stations will gain access, at 1000x speeds, to the Criminal Justice Information System, a database of criminal profiles and complaints, and higher bandwidth functionality, such as data sharing, images and video. The project also will connect 146 fire stations and emergency operations centers to the state's data network and provide interconnection among police, fire and

emergency management for the first time. The network will improve regional emergency radio communications, vastly enhancing crisis management capabilities. EOPSS, a key partner, will use the network for all its regional broadband needs.

Enhancing Education: We will directly connect all 10 area community college campuses, 232 K-12 schools and 9 other higher education institutions. The enclosed letters of support confirm the urgent need for first-time or expanded affordable access. K-12 schools need broadband to access advanced online courses and services for special needs students. Community Colleges need higher bandwidth requirements to expand services and courses to students and to enhance their workforce development programs. Colleges also need more bandwidth to share resources such as video, software and computational services. In addition, we expect that 241 K-12 schools and 20 institutions of higher education, that are not initially connected, may be customers over the next 5 years. This project will also provide access to important research facilities and educational networks: the proposed Holyoke High Performance Computing Center, a research facility funded by a consortium of universities (including MIT, Boston University, Northeastern, UMass) and companies (Cisco and EMC); Internet2; and National LambdaRail.

MassBroadband 123 will also directly connect to 126 libraries in the region. Many of these libraries use satellite dishes to connect to the Internet and provide a "hot spot" wireless connection for area residents to use even when the library is closed. We expect that 54 additional libraries could connect to the network over the next 5 years.

Improving Healthcare: MassBroadband 123 will connect 139 health facilities—including 18 hospitals—substantially improving access to applications like telemedicine, public health surveillance, and emergency preparedness. The expensive, inadequate and unreliable connections that link many of the smaller health facilities render them unable to exchange patient records outside of their practice and/or with the larger regional hospitals or those in Boston. The network is a critical component for the state's ARRA-funded efforts to implement electronic health records and create a health information exchange. The network will enable the hospitals to increase the quality and efficiency of patient care while reducing costs by eliminating unnecessary and expensive ambulance and personal trips for patients. There are an additional 184 healthcare providers that are potential customers for the network.

Connecting State and Local Governments: Massachusetts ITD, another key partner, has committed $3.1M in matching funds for the project and to transfer the broadband traffic of the

182 agency offices that will be connected. These critical agencies serve vital needs of the communities and include the Departments of Early Education and Care, Children & Families, Elder Affairs, Mental & Public Health, Veterans and Youth Services, Labor, and Workforce Development. The network will enable them greater access to key online tools at the same price they now pay for low capacity T1 service, leading to increased efficiency and improved quality of services.

The network will also directly connect 172 town halls, boards of health, and other municipal anchor institutions. Many of these locations have no access or relied historically on temporary grants to offset the high monthly cost for a T1, which is inadequate for their needs. We will provide access to over 20 state e-government applications.

Last Mile Services

By providing affordable, high-capacity middle mile service, this project will dramatically change how last mile providers are able to serve the region. The network will deliver a portfolio of middle mile offerings ranging from dark fiber to gigabit services—for the first time enabling last mile service providers in the region to offer robust, residential and business class Internet services at competitive prices. The network will encourage competition among providers and bridge the digital divide to the 388k households in the region. Eight last mile providers have expressed interest in utilizing the network and are planning to provide services via DSL, Fiber-to-the-Premises, Wireless, and a full range of commercial services (Metro Ethernet, and Optical). A new community network group, Wired West, is pursuing a municipal multi-town fiber to the home network and, if successful, they intend to use this network. The infrastructure will increase coverage in un/underserved areas and bring competition from providers not currently in the area.

Economic Growth

MassBroadband 123 will help the 44,306 area businesses thrive and new businesses to form. Our analysis shows that 2975 job-years will be created from the deployment and use of the network. Leading regional experts have weighed in on the impact. According to Rebecca Loveland of the UMass Donahue Institute, "opening up the market to the east and west of I-91 and Route 7 will be an economic development boon to the region because it will create greater choice for business location." Also, Amy Zuckerman, a global trends expert has researched western MA and discovered a phenomenon she calls "hidden tech", which are businesses "Run by one or two individuals who develop and sell products or services from a home or small office". With improved access to infrastructure Zuckerman projects these types of businesses

will "spread throughout the region, and more will come to counter the population drain and revitalize the economy. "

Expanding Broadband Adoption
The network opens great market potential in this 3,429 square mile region by offering open access, middle mile backbone infrastructure from which last mile providers can serve the 388,405 households, 44,306 businesses, and the 729 CAIs that will not be directly connected as part of the project. MassBroadband 123 will increase new broadband subscribers by nearly 30,000 after 5 years.

Conclusion
MassBroadband 123 provides a transformative infrastructure investment that will bring comprehensive broadband access to the CAIs, residents and businesses in western MA. But for NTIA funding, this project cannot succeed.

Vulnerable Populations:
MassBroadband 123 proposed funded service area contains severely impaired economic conditions and in partnership with the MA Executive Office of Housing and Economic Development, MBI has extensively analyzed the situation. There are 126,700 households and 11,675 businesses located in 11 communities defined by the NOFA as Economically Distressed Areas (EDA). Using the broader definition in 13 CFR 301.3 there are 336,000 households (87% of total) in areas that would qualify as economically disadvantaged. There are also 69 communities which qualify as Economic Target Areas as defined by the State of Massachusetts in MGL c. 23A.

All the counties served by MassBroadband 123 have seen economic welfare drop precipitously since the 1980s. As the area's economic health has deteriorated, the relative size and number of vulnerable populations has grown. According to detailed demographic information obtained by MBI from Claritas, a leading demographic data firm and the Census Bureau, of the 123 towns served, 95 exceed the national average for vulnerable populations. In fact, over three quarters (100) of the communities which represent 85% of the project area households, are home to more than one vulnerable population.

Many residents are first-generation immigrants, and larger-than-average ethnically vulnerable populations live in one third (41) of the 123 communities. Most of these populations are Hispanic.

Over three quarters (95) of the towns have greater-than-average elderly populations. A large aging population and a low population of the young adults needed to support a prosperous, sustainable economy put the entire region at long-term economic risk—and job scarcity is forcing even more young adults to leave the area. MassBroadband 123 directly connects nearly 50 nursing homes, senior centers, and councils on aging.

MassBroadband 123 directly connects 128 public housing facilities where high concentrations of vulnerable low income and elderly citizens live. A number of studies, including "Falling Through the Net: Toward Digital Inclusion" (AMIA 2003), report that vulnerable populations are much less likely than the population at large to own a computer, have Internet access, or access the Internet at home. The AMIA report also cites that improving access to digital information reverses the health and economic disparities evident today across the digital divide. Broadband services to public housing and CAIs that serve disadvantaged populations provide the opportunity for all at-risk populations to access resources and opportunities that enable them to break the cycle of poverty, poor health, and hopelessness.

Level of Need:
It is time to end the digital divide in Massachusetts!

For the residents, CAIs and business owners of western MA, the need for broadband is great, and they have waited far too long. Communities are losing population, businesses are unable to compete in the global economy, and students cannot develop the skills needed to succeed. Most towns in eastern MA have multiple options for last mile and middle mile broadband, but many towns in western MA are still waiting for an onramp to the information superhighway. According to Tim Brennan of the Pioneer Valley Planning Commission, "local communities have spent two decades attempting to address serious gaps in broadband service to no avail. The region needs the MassBroadband 123 project."

Uphill Battle for Essential Services
The significant grassroots efforts have not closed the digital divide. In the late 1990s, two business and economic development groups in Berkshire County and the Pioneer Valley realized the region was lagging in telecommunications infrastructure. Investment wasn't keeping pace, and costs for business class service were expensive. They created Berkshire Connect and Pioneer Valley Connect (PVC), non-profits dedicated to bringing broadband to the region. PVC's 2004 survey of hospitals, colleges, banks, manufacturers, small and home-based businesses and towns

throughout the region confirmed that service was unavailable, unreliable, and/or too expensive. Both groups forged private partnerships to offer T1 services at competitive rates, but high capital costs prevented further private expansion. In 2009, the groups merged to form WesternMA Connect (WMC), which remains a vital MBI partner.

MBI was created in 2008 by the Governor and Legislature to solve this problem. Since that time, MBA has worked with WMC, broadband groups, ISPs, and others to understand the need and craft a solution. The consensus in response to MBI's 2008 Call for Solutions RFI was that the region needs an open access middle mile infrastructure. MBI investigated building a network with state bond funds and private sector help, but the economic environment and rate of return proved too weak (NPV of -$51.5M) to attract private sector investment sufficient enough to solve this problem. Federal grant funding, in conjunction with MBI's match, will provide the capital essential to make this network a reality. The network is designed to capitalize on existing infrastructure to ensure efficiency. It will combine new fiber where none exists, with MBI's nearly completed I-91 network and existing fiber from our partners.

Lack of Competitive Middle Mile Resources
There is no competitively priced, middle mile fiber available in the region where last mile providers and CAIs can adequately obtain broadband service. The incumbent offers some services at prices as much as 10 times higher than the rest of the state and availability is spotty (see Galaxy Letter). Only 3 other commercial fiber routes serve the area. Two are long-haul routes with limited access points along instate freeways or they traverse isolated areas along high tension power lines. A third route is only a small fiber ring with access to a single community, Springfield. No dark fiber is available in the region, in contrast to Boston where more than 15 providers operate thousands of miles of dark fiber.

The region lacks the broadband profile of healthy economic areas, which have numerous competitive carriers, competitively priced communication services, and good service quality. 25 towns are either unserved or served only by spotty 3G wireless, and an additional 25 more towns are served by a single last mile provider. Incumbent providers have made targeted investments but no wide-scale expansion is planned. Half of Berkshire County has no cable service, and where available, coverage is incomplete and quality subpar. The average number of complaints is over 8 times higher than Metro Boston. This dearth of competition hampers anchor institutions' ability to serve constituents and contributes to the region's severe economic troubles.

The letters from the last mile providers attest that MassBroadband 123 will enable them to offer profitable service where they cannot today. AccessPlus Communications describes how: "The low density of the region's communities makes it impossible to create a profitable business plan if our company and companies like ours are faced with assuming the capital expenditure of building the middle mile. This project has the ability to make last mile service a reality for the thousands of residents and businesses who currently do not have access and for companies like ours who want to provide that access."

Economic Conditions

In the service area, 11 communities, with over 126,700 households, meet the NOFA definition of Economically Distressed Areas (EDAs) and there are 69 others, with 321,200 households which qualify as Economic Target Areas as defined by the state MGL c. 23A (see Maps). Most of the communities in the service area have incomes below the national average with many less than 80%. They also have a higher percentage of students who qualify for free or reduced-price lunches, compared to the statewide average. The 2009 Massachusetts Regional Economic Development Strategy Report concludes that "there is significant regional population loss, most acutely among young people. Manufacturing has suffered the most severe job loss and jobs continue to decline in all sectors." As the economy has deteriorated the percentage of vulnerable populations have increased. The region is fighting for its economic future. The Report also states that "a centerpiece of regional economic development efforts is the courting of small businesses and consultancies that are not location dependant. There is significant potential for growth in Creative Economy ventures. The absence of widespread broadband connectivity is a major barrier to the development of this sector."

Residential and Small Business Needs

Area residents use terms like hopelessly inadequate, abysmal, and unfair to describe the current state of broadband. We have received hundreds of letters from citizens describing how their lives are affected by not having quality access to high speed internet. From the parent whose child can't research a topic for his term paper, to adults who are unable to search for employment online or work from home when a child is sick. The stories also extend to the many home-based business owners who are hampered by spotty or expensive access. The lack of broadband impacts the quality of life of many residents and the success of many small businesses.

Larry Chernicoff attempts to run a communications consultancy from his Alford home—that is, when he is not forced to run it from his car parked at night outside the library trying to meet deadlines. John Ramsay of the western Massachusetts Regional Library System says the scene around the libraries providing satellite Internet access is filled with "blue lights flickering around the building, showing people's wireless devices taking advantage of the only game in town." David Divine cannot effectively download the technical information to fix cars at his automotive business in Egremont—and his story speaks to the thousands of "broadband-less" businesses in the region.

Public Safety Needs
The region's public safety communication and information infrastructure is very limited. Municipal police stations cannot effectively access the Criminal Justice Information System, either because they have no access or the connection they have is too slow. This prevents the area police from accessing comprehensive tools that provide up-to-the-minute information on suspects and advanced investigative tools. Access to this information could turn a routine traffic stop into an important arrest. Radio interoperability among public safety personnel is also problematic as fire services cannot participate in coordinated statewide dispatching or emergency response.

The Western MA Chiefs of Police Association, said "…we know the value of high speed broadband service. Unfortunately, due to the geography and rural nature of our area... broadband service is not only difficult and expensive to obtain, but in many cases, unavailable."

Public Health Needs
As healthcare technology, such as electronic medical records and tele-medicine, continues to advance, citizens in western MA are being left behind. Small healthcare providers cannot connect to regional hospitals, and regional hospitals are unable to connect to Boston teaching hospitals in order to gain access to top-notch physicians, consults, and other services.

David Delano, CIO of Northern Berkshire Healthcare outlined his concerns about the reliability, stability and capacity of the region's broadband infrastructure, explaining that "with the aging infrastructure...when we lose connectivity our patient's lives are put at risk and we erode trust regarding our ability to provide reliable, high quality and safe healthcare. We are very concerned about the future of the hospital if we cannot rely on the local… infrastructure to meet our needs today and going forward."

Higher Education Needs
The 10 community college campuses in the area serve 36,000 students and provide much needed career and technical courses. With western MA's loss of traditional manufacturing, these schools have become a critical tool in the effort to retrain workers for the new 21st century careers in the technology and life sciences sectors. Providing low-cost high bandwidth broadband to community colleges and the students they serve is essential to ensure a literate, trained workforce for the new economy.

According to Ira Rubenzahl, president of Springfield Technical Community College. "Without an increase in the infrastructural capacity to deliver high bandwidth broadband access to our students, STCC faces a very real danger of not being able to deliver the cutting edge technological education that our students must have in order to be competitive in the global economy."

State and Local Services
Many state agencies, including the Departments of Early Education and Care, Children & Families, Elder Affairs, Mental & Public Health, Veterans and Youth Services, and Labor and Workforce Development, comprehensively serve the needs of the communities. Many of these agencies are either unable to access critical state or national databases, or pay extremely high prices for these services. At the local level, lack of broadband prevents town governments from accessing the mass.gov portal which supports 20 different applications that local government can use to expedite services such as online financial reporting and local aid distribution. Inadequate broadband leads to decreased government efficiency and reduced customer service.

Need is Great
State investment alone cannot reach all the communities in the region—NTIA funding is essential. According to Adesta LLC, a regional telecommunications construction company, "The MBI project is the solution no private company could afford to build without public support." Although providers have made efforts to respond to communities, the limits of private middle mile investment have been reached. Without federal assistance, the area will remain technologically, economically, and educationally behind the rest of the state and the country. With NTIA funding, that longstanding vision for ending the digital divide in western Massachusetts will be realized.

The MA Regional Strategy report stated that, "Broadband connectivity is the single most important economic development priority for Berkshire County and...the Pioneer Valley ...akin to electricity, indoor plumbing and the telephone, it is impossible to understate the competitive disadvantage that people, businesses and municipalities confront in the absence of broadband internet service."

H. Technology

Technology Type

Indicate the technology that will be used to deliver last mile services. The following items were selected:

Wireline - Fiber-optic Cable

Wireless - Terrestrial Fixed

Other:

Technology Questions

Methodology for Area Status:

In 2009, Governor Deval L. Patrick designated MBI as the "eligible entity" for receiving broadband data funding under the ARRA BDIA mapping program. Under this program, MBI received $1.5M for broadband data collection and mapping activities over a two-year period and $500k for broadband planning activities over a five-year period.
In late 2009, MBI conducted a detailed assessment, using only publically available data, of address-level broadband availability in the western part of MA. In this study, MBI used six separate analysis techniques, including the following:
1. Analyzed cable strand maps from the MA Department of Telecommunications and Cable to determine which homes are capable of being served by cable. All cable providers operating within the Commonwealth are required to file and update information related to the location of their cable strands.
2. Identified the location of central offices and remote terminals in western MA. Using data from provider websites, MBI identified which central offices and remote terminals are currently DSL-enabled and then estimated the propagation of DSL over an 18,000 foot radius, assuming all homes within the DSL propagation have access to broadband.

3. In 2009, conducted a web-based survey of households whereby respondents could indicate whether they had broadband service at a given address. To date, there have been over 1,850 responses.
4. Used maps of wireless provider's 3G/4G coverage, publicly available on their websites.
5. Partnered with WesternMA Connect, a grass roots organization created to assess and aggregate broadband demand in unserved areas in western MA. It has been assisting MBI in collecting information about broadband availability in western MA.
6. Used statistical modeling and customer demographic segmentation to estimate adoption of broadband based on availability.

Using the above data sources, MBI analyzed broadband in western MA according to the criteria from the NOFA. MBI defined its service areas, based on this analysis, to clearly delineate contiguous areas of unserved, underserved, and served areas based on which of the three criteria was met.

MBI's analysis of the Proposed Funded Service Area identified two unserved Service Areas, containing roughly 1,240 households, 336 businesses, and 20 CAIs, and six additional underserved Service Areas, containing 31,020 households, 7,365 businesses, and 431 CAIs. Six Service Areas are served under the NTIA definition. These served areas contain approximately 126,000 households in Economically Distressed Areas.

Description of Network Openness:

MBI's MassBroadband 123 will be a publicly owned, carrier-neutral, open-access, middle-mile network. It will offer wholesale connectivity at reasonable prices and under nondiscriminatory terms to network service providers (NSPs): ISPs, CLECs, wireless ISPs, fiber providers, mobile data providers, and others. MassBroadband 123 will foster a competitive market in which NSPs serve community anchor institutions, governments, and the public.

MBI is committed to the principles of openness, nondiscrimination, and customer choice. Everything about MassBroadband 123 – from technical standards to operating policies, from financial terms to the location of facilities – reflects that commitment. Interconnection policies, rates, terms, and conditions will be reasonable, nondiscriminatory, public, and applicable to any qualified party wishing to interconnect. They will meet or exceed the openness, non-discrimination, interconnection, and carrier choice obligations as set forth in the NOFA (Section V.D.3) including adherence to FCC-05-151 and subsequent rulings and statements, not favoring any lawful application and content over others, prominent display of policies on web pages and

advising customers of changes, connecting to the public Internet, and offering interconnection at reasonable rates and terms.

Selection criteria for MBI's network operator will include commitment to these principles and obligations as well as operational capability to fulfill them in an open, dynamic, multi-carrier environment. MBI will contractually bind the network operator to these obligations and monitor its performance. MBI and its network operator will agree to binding arbitration for disputes relating to interconnection.

The physical network and its geographic layout is designed to facilitate interconnection, to not favor one provider over another, and to support multiple last-mile carriers coexisting in the same geographic area. All routes will have sufficient fiber to support multiple NSPs, and slack loops located at frequent intervals to facilitate interconnection and reduce the expenses of last mile connections. MBI's policies will prevent monopolization of the fiber. Additional field interconnection facilities for service providers will be made available at carrier-neutral hub locations.

MassBroadband 123's fiber plant includes termination at the 1 Federal St. Springfield carrier neutral collocation facility, and low-cost, high-capacity connectivity via IRUs to collocation facilities in Boston that provide interconnection with Northern Crossroads Internet2 and many more commercial carriers.

MBI will require its network operator to use generally accepted technical measures to allocate bandwidth, to prevent security risks, attacks, and other harmful activities, and to provide acceptable services to all customers, and that such measures be administered in an open, application-neutral, and nondiscriminatory manner as applicable.

System Design:

MassBroadband 123 provides throughout its service area a high strand count middle mile fiber network designed to provide essential infrastructure to reduce costs and ease deployment of fiber connections within the region, while also laying the groundwork for connections to serve CAIs, businesses, last mile service providers, and carriers. Active components supporting Carrier Ethernet and SONET/TDM are placed at over 20 sites so that no CAI is more than 30 miles from an active node, and most are within 10 miles, allowing the use of low-cost optics. The routes were determined based on reaching as many important CAIs as possible, while following

existing pole routes to reduce deployment costs and speed deployment times. Fiber is also run to many public safety wireless sites to enable Public Safety, WISPs and CMRS providers to leverage middle mile fiber for cost-effective backhaul.

One Federal St. in Springfield—the primary carrier-neutral hotel for western Massachusetts that houses several ISPs, CLECs, and IXCs—will serve as the core Internet connection site. Lit services are based on Carrier Ethernet (Ethernet Private Line and Ethernet Virtual Private Line), TDM (DS1, DS3, SONET), and Lambda (wavelength). Ethernet services will connect CAIs and other commercial subscribers to their choice of ISP. TDM services are provided for voice and data use—including PBX trunks—and to service wireless networks, while TDM to comm facilities will support legacy radio systems that are vital to public safety. IP services will be provisioned by ISPs on an open access basis. Dark fiber will also be offered for lease or long-term IRU.

The primary active components to provide these services will be Multiservice Provisioning Platforms (MSPPs) and Carrier Ethernet Switches. MSPPs will provide TDM services, EPL, and EVPL. EVPL can be provisioned on an MSPP in isolated bandwidth pools to meet public safety requirements while allowing capacity sharing amongst members in a pool. Carrier Ethernet switches will also provide EVPL for commercial users and ISPs. Small MSPPs or Ethernet switches will be deployed at multi-user sites; single-user sites will be served from the nearest node. Lambda services are provisioned from OADMs in several key locations along the primary backbone route, with 10 Gbps lambdas provided initially and options to upgrade OADMs to 40 or 100 Gbps lambdas. OADMs will also provide amplification for connections to Boston and other areas outside the MassBroadband 123 region. NEREN has offered lambda service to carry Internet2 and commercial ISP traffic from One Federal to a large carrier neutral Internet point of presence in Boston (the Northern Crossroads Internet2 peering point at 1 Summer St.), and to Providence RI where we can cross-connect with OpenCape for public safety users. UMass MITI has offered an IRU to meet our planned northern corridor in Ayer, providing an IRU for a second route to Boston, giving in-state redundancy for public safety and others.

Appropriate spare capacity has been engineered into all routes to facilitate future growth without incurring large construction costs and delays. Bit rates can also be raised, and additional WDM can be deployed. Services, including dark fiber, and interconnection to service providers, can be delivered to any point along fiber paths via drops and laterals run from slack loops or splice cases that will be deployed at frequent intervals. Collocation will also be available at field locations, thereby allowing last mile providers to provision their networks using MassBroadband 123 fiber. MBI policies and high fiber count (mostly 144-288 strands) will prevent monopolization and allow multiple ISPs and carriers to share the network. Service can be

provisioned to WISP radios at any point along the fiber, using dark fiber backhaul to an MBI or WISP active node, and Distributed Antenna Systems can also be readily supported.
Critical sites, including major public safety sites and PSAPs, will be homed on two nodes, in a tributary ring arrangement, for maximum reliability. Major fiber sheaths will carry parallel backbone and tributary strands. Hence, the deployed topology will be a mix of ring-of-rings and ring-of-stars.
BTOP funding is designated for deployment of 1,012 miles of new fiber optic sheath routes. New MSPPs, Carrier Ethernet switches and OADMs will be procured, along with fiber modems for CAIs and service provider connections. The existing facilities to Boston and elsewhere will be procured via IRU, not by overbuilding. A new northern fiber route from Greenfield to Ayer, then via IRU to Boston adds redundancy outside of the widely-used Turnpike route and serves economically-disadvantaged areas en route. While approximately 50 ILEC central offices will be passed, collocation within them is out of scope and is left to CLEC customers.
Optical fiber was chosen over microwave radio technology based on its capacity and lower unit cost. MBI's goal is to facilitate broadband connections across the MassBroadband 123 region by providing substantial middle mile capacity to CAIs and last mile providers. Mountainous terrain and dense foliage increases risk for an all-wireless solution, while the proposed ringed fiber network (see topology map) provides redundant paths for high reliability in all weather conditions. MassBroadband 123 is cost-effective due to use of existing conduit and aerial fiber on existing poles for over 96% of its distance. Active components account for less than 10% of costs while high fiber count on most routes adds only about $1/foot while facilitating strand-intensive applications (such as DAS and backhaul to a regional head end) and ensuring capacity to competitive operators.

Is the applicant seeking a waiver pursuant to section IX.C of the NOFA so as to sell or lease portions of the award-funded broadband facilities during their life?

No

I. Project Budget

Project Budget		
	Federal Grant Request	**Match**
Last Mile	0	0
Middle Mile	45,445,443	26,200,000

Total	45,445,443	26,200,000

Project Budget Total: $71,645,443

Match Percent: 36.6%

Projects Outside Recommended Funding Range:

- The MB123 project is within the recommended funding range.

Outside Leverage	
Applicant is providing matching funds of at least 20% towards the total eligible project costs?	Yes
Matching cost detail	MBI is pleased to commit $26.2 million (36.6% of the MassBroadband 123's project's cost) in matching funds. Of this total, $23,088,647 (32.2% of the project cost) is in cash and $3,111,353 (4.34% of the project cost) is an in-kind contribution. There are two principal sources of the match funds. The first ($20 million) will be provided directly by the applicant. The second ($6.2 million) will be provided as a cash match by the Commonwealth of Massachusetts through two state agencies, the Executive Office of Public Safety and Security (EOPSS) and the Information Technology Division (ITD). MBI's $20 million match consists of a $16,888,647 cash match and a $3,111,353 in-kind match. The in-kind match is for the portion of the I-91 fiber project that has been constructed to date. The I-91 project is a 55-mile, 288-strand underground fiber network which is an integral part of the overall MassBroadband 123 project, providing one of the two key north-south routes. The applicant's review of the BTOP eligible cost rules confirms that the costs associated with building the I-91 portion of the overall network constitute eligible costs.

	The following provides additional information about each of the matching fund sources: Name of Party: Massachusetts Broadband Institute (MBI), a non-divisible component of the Massachusetts Technology Collaborative (MTC), a public instrumentality of the Commonwealth of Massachusetts. For purposes of this application, MTC and MBI are referred to collectively as MBI. Funding Amount: $20,000,000: $16,888,647 in cash (23.6% of total project budget) $3,111,353 in-kind contribution (4.34% of total project budget) Type of Funding: Grant Match; from state bond proceeds Use of Funding: Capital (Infrastructure) Key Financing Terms and Conditions: N/A This funding is pursuant to Chapter 231 of the Acts of 2008, An Act Establishing and Funding the Massachusetts Broadband Institute (Broadband Act) and the Funding Agreement we have executed with the Massachusetts Executive Office for Administration and Finance governing use of the funds provided to the MBI pursuant to the Broadband Act. The Funding Agreement permits the MBI to utilize the funds provided to it by the state for the project proposed in this grant application. Name of Party: Commonwealth of Massachusetts, Executive Office of Public Safety and Security (EOPSS) Funding Amount: $3,100,000 in cash (4.32% of total project budget) Type of Funding: Grant Match; from state bond proceeds Use of Funding: Capital (Infrastructure) Key Financing Terms and Conditions: N/A The Executive Office of Public Safety and Security has pledged to

	provide cash contributions in the amount of $3.1 million. Please see the attached letter from the EOPSS Secretary, Mary Elizabeth Heffernan, regarding the $3.1 million in cash match funds. Name of Party: Commonwealth of Massachusetts, Information Technology Division (ITD) Funding Amount: $3,100,000 in cash (4.32% of total project budget) Type of Funding: Grant Match; from state bond proceeds Use of Funding: Capital (Infrastructure) Key Financing Terms and Conditions: N/A The Information Technology Division has pledged to provide a cash contribution in the amount of $3.1 million. Please see the attached letter from the state Assistant Secretary for Information Technology & Chief Information Officer, Anne Margulies, regarding the $3.1 million in cash match funds. Please see the attached letter from the state Secretary of Administration and Finance, Jay Gonzalez, supporting the use of bond funds from the MBI, EOPSS, and ITD as cash and in-kind match for the BTOP grant. While not included in this proposal, as the project progresses we anticipate significant in-kind contributions from project partners will add additional leverage and benefit to the project. Examples of additional in-kind contributions include: * Contributions of space from municipal governments to house network equipment * Use of Operational Support Systems (OSS), Billing Support Systems (BSS), and other network management equipment contributed by the operator(s) selected, through competitive procurement, to operate the middle-mile network

	* Use of installation and maintenance vehicles owned or leased by that same network operator.
Unjust enrichment	The Applicant has not received, nor has it applied for, any Federal support for non-recurring costs in the service area for which this application is seeking an award. The Applicant does not have any subrecipients for this application. The Massachusetts Technology Park Corporation D/B/A Massachusetts Technology Collaborative (MTC) is an integral part of the Commonwealth for many purposes, including for federal tax purposes. However, and more particularly, MTC is an independent public authority and for purposes of this application is acting as a legally distinct entity from the Commonwealth. The Massachusetts Broadband Institute (MBI) is a non-divisible component of the MTC. Accordingly, neither MTC or MBI should be construed as a recipient or sub-recipient of federal funds which are received directly by the Commonwealth of Massachusetts in other areas, for example, such as in the Massachusetts Department of Transportation. MBI has received one other federal award. In 2009 the NTIA awarded MBI a grant for State Data and Development mapping and planning. This award is distinct from this project, but does include recurring costs for broadband mapping for the entire state, including the service areas in this project. This project will provide information to the mapping and planning effort. MTC has received two awards through its Massachusetts e-Health Institute (MeHI) division. MeHI is separate and distinct business division from MBI within MTC. The first award is a $13.4M ARRA grant to be the state-designated Regional Extension Center, a program to help primary care providers in small group practices implement and achieve meaningful use of electronic health records systems per the HITECH Act. MeHI also received a $10.6M ARRA grant to create an interoperable health information exchange.

	Both of the MeHI grants will be used to support recurring costs of adoption of electronic health records throughout the state, including the service area covered by this project. Neither grant includes non-recurring costs in the service area of this project.
Disclosure of federal and/or state funding sources	The MBI, a division of MTC, has not received from the federal government, and it is not requesting from the federal government, funds for the MassBroadband 123 project other than those being requested in this application. The MBI is not seeking or receiving funds from the Universal Services Fund. The MBI has secured two sources of state funding, totaling $26.2 million, to support the MassBroadband 123 project: 1. MBI is committing $20 million to the project as part of the overall $26.2 million state match being proposed. Of the $20 million from MBI, (i) $16,888,647 is a cash match, and (ii) $3,111,353 is the in-kind match of the I-91 corridor network. Both the cash match funds and the funds used to pay for the I-91 corridor network come to MBI from proceeds of Commonwealth of Massachusetts general obligation bond funding. This bond funding was authorized as part of MBI's enabling legislation, Chapter 231 of the Acts of 2008, An Act Establishing and Funding the Massachusetts Broadband Institute (Broadband Act). 2. Each of the Commonwealth's (i) Executive Office of Public Safety and Security and (ii) Information Technology Departments have committed to provide $3.1 million in matching state funds towards this project – for a total of $6.2 million in additional state funds being used as part of the match. These funds will be drawn from bond proceeds assigned to the creation of the Massachusetts Safety and Security Network, and if necessary, annual appropriations. Please see the letters attached to this application from (i) the state's Chief Information Officer, Anne H. Margulies, and (ii) the Secretary

	of Public Safety and Security, Mary Elizabeth Heffernan, pledging up to $6.2 million collectively from these agencies as a cash match for the BTOP grant, as well as detailing their anticipated uses of the MBI's network.. Attached to this application is a letter from Massachusetts Secretary for Administration and Finance Jay Gonzales describing the funding commitment from all sources. We want to take an opportunity in this section to clarify a potential question about source of state funding that could arise when one reads the Historical Financials section of this application (Section 14). The financial information included in that table is a summary of applicant's (Massachusetts Technology Park Corporation D/B/A the Massachusetts Technology Collaborative or "MTC") financials for those time periods. MBI is a division of the applicant. The net assets of applicant that are shown at Section 14 are held by applicant on behalf of several different operating divisions, and under enabling legislation each division only has access to its own revenues and net assets.
Budget reasonableness	The MassBroadband 123 (MB123) project delivers excellent value for its cost while fulfilling the goal of comprehensively serving communities in western MA. The project deploys a middle mile fiber-optic network which is the only viable technology given the hilly and heavily wooded terrain of the service area. The network crosses the Appalachian Mountains several times to serve towns that currently have no middle or last mile broadband service. Outside plant (OSP) represents 70% of the project budget and is designed to minimize cost and ensure timely completion with 96.8% of the new fiber installed on existing utility poles. A field survey of the route enabled the MBI team to accurately estimate total OSP units, value engineer alternatives, maximize CAI connections, and minimize environmental impact. In addition, MBI leases IRUs on existing fiber cables where possible. Price quotes from multiple vendors for appropriate quantities and types of fiber and equipment were used for

	unit costs of purchased items. The network includes 307.4 miles of leased fiber at a cost of $4.1M, and 1,012 miles of new fiber at a cost of $42,430/mile. All-in cost compares favorably to the actual construction costs of the Five Colleges fiber network built in the same region. Experience of the team in building fiber networks throughout MA confirms that the costs are realistic and comparable with costs to deploy other networks in and around MA. Construction productivity rates and labor requirements were based on this experience and estimates from 3 area contractors. Costs in MA are higher than many other states. Local union prevailing wages for appropriate job classifications are used in this budget, including known rate changes. Police details are also required more than in other states and are included. In order to reduce investment hurdles for last mile providers and encourage market entry in unserved areas MB123 builds a lit network, and uses two IRUs to provide transport to out-of-area inter-connections. IRU costs were estimated based on direct quote or NPV of payment obligations. Network equipment accounts for 9% of the budget. Ethernet switching, DWDM and SONET transport and other access CPE equipment is specified to deliver the services and capacity required today and to allow for future growth. Cost estimates were based on competitive quotes from leading vendors and included standard state discounts. Engineering, Testing, and Program Management Costs, including MBI oversight and grant compliance costs were based on a detailed staffing plan developed by Jacobs Engineering and validated through discussions with independent experts and MBI. Cost per CAI connected of $51,469 compares favorably to the Gates Foundation benchmark of $65k for rural CAIs.

Demonstration of need	Without BTOP funding, the MassBroadband 123 project could not be built. Because of the limited infrastructure that exists, private service providers cannot serve the un- and under-served areas and expect a reasonable rate of return. Multiple incumbent operators hold cable franchises next to unserved areas but do not expand to these areas because there is simply too much geography to cover and too few subscribers to make deployment work without significant investment in infrastructure. The Net Present Value (NPV) analysis of our project quantifies the scale of the problem faced by this rural region. Assuming available state funds are used to subsidize the project, without BTOP grant funding the NPV of the MassBroadband 123 network is -$[redacted] over 8 years, inclusive of terminal value. We seek $[redacted] to close the funding gap. The negative NPV is not due to under-pricing services on the network. Prices have been benchmarked to comparable commercial offers as documented in the Key Assumptions. Furthermore, discounts are limited and selective: a 15% discount is applied only to state institutions that are providing a cash match for this project. In the absence of a workable financial model for private sector financing, public funds are necessary to close this funding gap. The state is providing as much as it feasibly can. MBI's funding source is from proceeds of bond financing authorized by the state's Secretary of Administration & Finance. MBI is committing the maximum amount of such bond fund proceeds authorized by the Secretary for this project, $20 million, as a match (see attached letter). In addition, MBI has done everything it could, particularly in light of the state's fiscal crisis, to enlist support from other state agencies and has secured $6.2 million in matching fund from EOPSS and ITD, as more fully discussed in the Matching Cost Detail section. (As explained in the last paragraph of "Disclosure of Federal and/or State Funding Sources" above, MBI, a division of applicant, does not have access to

	the net assets of applicant's other divisions.) The only viable source of funds to close the funding gap is a grant under the BTOP program. Having committed available state funds to the project, MBI is seeking a BTOP grant in an amount necessary to cause the NPV of the project to become positive, thereby making the project viable.

Funds to States/Territories

States	Amount of Federal Grant Request
Massachusetts	45,445,443

Funds to States/Territories Total: $45,445,443

J. Historical Financials

Matching Funds			
	2007	**2008**	**2009**
Revenue	60,100,673	42,374,302	55,064,358
Expenditures	37,982,845	55,429,388	61,715,174
Net Assets	271,695,627	258,640,541	251,989,725
Change in Net Assets from Prior Year	22,117,828	-13,055,086	-6,650,816
Bond Rating (if applicable)	n/a	n/a	n/a

K. Project Readiness

BTOP Organizational Readiness

MBI was created by state law to meet this need, and it has highly qualified project and business managers ready to make MassBroadband 123 successful from day one.

MBI was strategically placed as a division of the Massachusetts Technology Collaborative, the state's technology development agency, which has a 28-year history of successfully managing complex projects totaling around $450M in federal and state funding. MTC has the financial management and legal mechanisms in place to ensure compliance with rigorous state and federal procurement laws. MTC has a proven track record of clean audits.

MTC & MBI Boards of Directors are committed and prepared to make this project a success. The MBI Board includes MIT Professor David Clark-a father of the Internet, as well as the state's Telecommunications Commissioner and the state's CIO. MBI has solid partnerships with the state's Information Technology Division and Executive Office of Public Safety & Security, which will devote significant staff expertise to the project. Additionally the Advisory Committee (see resumes) has strong network build and management experience and will guide the project.

Judith Dumont, MBI Director, led an $87 million business unit for Lightbridge and has strong operational experience. Donna Baron, Network Program Director, will handle the daily management and oversight of the network build. She is managing the I-91 project and previously built the 5 Colleges Network, used by 7 communities and Amherst, Hampshire, Mt. Holyoke and Smith colleges and UMass Amherst.

MBI's staff is augmented by its consultants (see resumes) who have built carrier-class networks in region and worldwide. Jacobs Engineering led construction budgeting and scheduling, and with Galaxy Internet Services developed the network design. CSMG helped develop the business case and evaluate network operators to ensure that the network is sustainable.

MBI will hire at least 2 highly-qualified construction contractors to build the network, a Project/Construction Manager and one or more construction companies. Leveraging their expertise MBI will ensure the network is efficiently built to high standards on time. MBI has secured support from pole owners, including Verizon, to help expedite the make-ready process, and preparation for permitting is underway.

MBI will contract with and oversee a qualified company to act as the network operator responsible for all operations including sales, customer support, accounting, and fiber

maintenance. MBI has included 12 letters of interest from companies such as Level 3, RCN and Zayo. MBI has issued an RFI and will use this information in the procurement process, which is underway.

Construction and Vendor Contracts

MBI is governed by MA state procurement laws that dictate a public, competitive procurement process for design and construction contracts. All procurements will comply with applicable laws and grant requirements. The network relies on contractors and vendors for:

1. Program /Construction Management and Engineering Support: MBI will issue an open and competitive RFP during Spring 2010 for a PM/CM firm to finalize engineering, acquire licenses and permits, oversee construction and conduct quality assurance.
2. Integrated Design/Build: MBI will issue an open and competitive RFP to contractors, for a range of design/build services. MBI will use one or more firms for timely completion to perform construction permitting, install the fiber and connect to the CAIs.
3. Network Operations: MBI conducted a RFI for a network operator. 12 companies expressed their strong interest in providing network operations services. MBI will issue an RFP to select a highly experienced network operator to run the network operation and provide lit and dark fiber service to Commonwealth agencies (e.g Public Safety, ITD), CAIs and private internet providers delivering service to the 123 municipalities. The procurement for the network operator is underway with a plan to select the vendor in 2010.
4. Network equipment: MBI will seek to leverage the Commonwealth's list of standing contracts, which includes state-approved vendors that sell network equipment that is required to light the fiber.

Customer Base

The MBI is an entity of the Commonwealth and does not have a commercial customer base. The Commonwealth intends to be an anchor customer of MassBroadband 123 as soon as the network becomes operational. Together these agencies have 560 locations that will be directly connected through the project.

The network will primarily be managed by an experienced Run the Network Operator (RTNO), who will be selected by the MBI pursuant to a competitive procurement process. The MBI has already issued a RFI and the responses to the RFI will inform the development of the RFP.

Twelve companies have submitted letters of interest to serve this role. The selected RTNO may bring its own customers onto the network.
One partner, UMass MITI, has indicated that it has over 200 libraries, K-12, community colleges, and other educational institutions in its customer base. It intends to use our infrastructure to serve those connected in our service area.

Licenses, Regulatory Approvals and Agreements

MBI fiber optic cable will be installed primarily on existing utility poles in the public right of way (ROW), reducing the types of licenses and approvals needed.

In July 2009 the state passed special economic stimulus legislation enabling MBI to acquire IRUs and be exempt from certain local zoning by-laws. The MBI has executed agreements with MassDOT (in July 2009) and the MA Department of Conservation and Recreation (in March 2010) that provide a framework for the MBI to access ROWs for broadband deployment.

Pole Attachment: Preparation for license applications from Verizon, Northeast Utilities and National Grid is underway and we have received and included support letters from all 3 companies in the application.

Facilities Lease Agreement: Pending for space at One Federal St, Springfield's carrier-neutral hotel and Internet POP.

IRU Agreements: NEREN and UMass MITI offered IRUs for path diverse transport to Boston. Discussions have occurred regarding the framework of the arrangement and negotiations are pending award.

Local Approvals and Agreements: MBI is working with the regional planning agencies and towns in the project footprint to develop agreements for the placement of network termination points.

Construction Permits: Will be obtained by MBI's outside plant contractor.

Network Operation: MBI will issue an RFP to select a network operator. The network operator will obtain any licenses and agreements needed to operate the network.

Submitted Date: 3/25/2010 8:07:44 PM	**Easygrants ID: 4722**
Funding Opportunity: Broadband Technology Opportunities Program	**Applicant Organization:** MASSACHUSETTS TECHNOLOGY PARK
Task: Submit Application - BTOP	**Applicant Name:** Mr. Mitchell Lash Adams

SPIN Number

The MBI does not have a SPIN number.

L. Environmental Questionnaire

Project Description

Cable construction is 96.8% aerial on existing utility poles; 1.0% on new poles, 2.1 % underground in existing conduit and 0.1% new conduit. New conduit is also required for drops to CAIs where aerial access is prohibited. 10% of the CAIs require underground cable entry. New 35 ft. poles, placed at intervals of 142 - 250 ft. using auger equipped trucks, bring the network to community anchor institutions (CAIs), businesses and residents. Cable in existing conduit occurs along major routes where aerial placement is cost prohibitive or local ordinances require underground placement. When a new conduit is necessary, direct burial is used to minimize ground disturbance. To cross roads, streams, or other features and aerial poles are not possible, horizontal directional drilling (HDD) will be the construction technique. Environmental impacts will be mitigated. Internal building modifications will include minor building modifications at One Federal Street in Springfield and at 22 centralized nodes. Construction at the nodes includes electrical service upgrade and distribution, grounding, upgrade of HVAC systems and installation of 2 equipment racks. The upgraded service feeds outdoor equipment cabinets hosting last mile service provider gear. Building modifications at One Federal Street in Springfield will include risers, utility connections, back-up power, dedicated HVAC system, and fire suppression.

Property Changes

Linear Facilities: The majority of the property used will consist of existing public rights of way, where a license to install and maintain the cables must be obtained. Some areas of new right of way may be necessary for cable runs to Nodes or to reach Community Anchor Institutions. If roughly 0.25% of the system (2.25 mi. of the 1012 route miles) were to require a 10' wide right of way, about 2.7 ac. would be required in either permanent ownership or a long term lease. The land would be cleared and maintained as accessible rights of way.

Equipment Cabinets: The siting of 22 small equipment cabinets is required. Cabinets are approximately 5' wide, 2' deep and 4' tall and are positioned on a concrete slab. If each cabinet and associated slab requires about 30 sf, about 630 sf would be required project-wide. The cabinets will be sited on community owned or utility owned land so land acquisition will not be required.

Current Land Use and Zoning: The project area consists of numerous small, independent communities. The majority of the land in the area is zoned for open space and residential land uses. Preferred land uses for locating project elements that must be located off the public rights of way are utility owned lands, community owned lands, and community owned open space.

Land Owned or Managed by the Federal Government: There are no substantial areas owned or managed by the federal government in the project area. No such areas will be affected.

Buildings

The project includes modifications to an existing building at the point of presence of the system, at each of the 7 Major Centralized Facility Nodes, and at each of the 17 Local Nodes.

Point of Presence: The point of presence is at an existing building at One Federal St. in downtown Springfield, Massachusetts. MBI will lease about 100 sf of space on an upper floor and about 100 sf in the basement. The equipment installed will consist primarily of packaged switch gear mounted on racks. The spaces will be heated and air conditioned and will have fire and intrusion alarm systems.

NODES: There will be a small equipment cabinet located outside of each of the Major Centralized Facility Nodes and each of the Local Nodes. Building modifications will be required at each Node location to install new conduit and cable running from the cabinet into the building.

Linear Facilities: The majority of the project utilizes existing previously disturbed public rights of way. Some areas of new right of way may be necessary for cable runs to Nodes or to reach CAIs.

Wetlands

Resources: The project area includes the Connecticut, Chicopee, Deerfield, Farmington, Housatonic, Millers and Westfield Rivers. Numerous freshwater wetland systems are associated with these rivers and their tributaries. Project area NWI mapping shows the following freshwater wetland types: Riverine, lakes, ponds, and scrub shrub, emergent, and forested wetlands, as well as complexes made up of several of these wetland cover types.

Use of Existing Facilities: No clearing of vegetation or other wetland impacts are necessary to complete cable installation on existing poles or in existing conduit.

New Aerial Lines: In 8 locations, new aerial lines are in close proximity to NWI wetlands. These lines will be run adjacent to existing roadways and are not expected to encroach into wetlands.

New Direct Bury Lines: Direct-bury installation will occur within 4' of existing paved roadways and therefore will typically be located within the previously cleared limits of the roadway right of way. If the typical installation location will involve impacts to wetlands, the cable will be relocated outside of the resource area.

Equipment Cabinets: Equipment cabinets will not be located within wetland resources and cabinet slab construction will not have any direct or indirect impact on wetlands.

Conclusion: Due to the high degree of flexibility in placement of system elements and the ability to make use of existing infrastructure, impacts to wetlands are not anticipated.

Critical Habitats

Sources: Federally Listed Endangered and Threatened Species in Massachusetts (06/22/2009), USFWS website.
State Priority and Estimated Habitats: Ma. Division of Fisheries and Wildlife, Natural Heritage and Endangered Species Program, (NHESP) Mass GIS data layers (PRIHAB_POLY and ESTHAB_POLY, 10/08).

Resources:
Federal Critical Habitats: No federal critical habitats occur in the project area.

Federally Listed Species: The 5 species listed in the project area counties are shown in Table v-1, below.

State Priority and Estimated Habitats: At least one NHESP Habitat polygon occurs in every project area town except for two.

State Listed Species: State-wide there are 176 species of vertebrate and invertebrate animals and 259 species of plants listed as Endangered, Threatened or Special Concern.

Use of Existing Facilities: No impacts to listed species habitats will occur due to cable installation on existing poles or in existing conduit.

New Aerial Lines: New pole lines will not involve impacts to listed species habitats because they will be installed within existing rights of way that are not considered habitat areas or will be rerouted to avoid such areas.

New Direct Bury Lines: Direct burial will not result in alterations of listed species habitat.

Equipment Cabinets: Equipment cabinets will not be sited within listed species habitat.

Conclusion: The degree of flexibility in locating project elements will enable avoidance of impacts to listed species habitats.

Floodplain

Resources: FEMA identified 100-year and 500-year floodplains are associated with the Connecticut, Chicopee, Deerfield, Farmington, Housatonic, Millers and Westfield Rivers and their tributaries.

Use of Existing Facilities: No clearing of vegetation or other floodplain impacts are necessary to complete cable installation on existing poles or in existing conduit.

New Aerial Lines and Conduit: No new aerial lines or new conduit are proposed within 100-year or 500-year floodplains.

New Direct Bury Lines: Direct burial will not result in fill or permanent alterations within the flood zones.

Equipment Cabinets: Both for reasons of resource impact avoidance, and for safe operation and maintenance of the equipment, equipment cabinets will be located outside of any floodplain areas.

Conclusion: Due to the high degree of flexibility in placement of the system cable routes and the equipment cabinets, and the ability to make use of existing aerial pole lines and existing underground conduits, impacts to floodplains are not anticipated.

Protected Land

Resources: The MA Historical Commission (MHC) database lists over 9,000 National Register Eligible Historic districts, National Register Eligible properties and Historic Landmarks in the project area.

Use of Existing Facilities: Existing pole lines will be used within historic districts in the following towns: Amherst, Ashfield, Adams, Becket, Belchertown, Brookfield, Charlemont, Chester, Egremont, Granville, Granby, Hawley, Holyoke, Lenox, Lee, Ludlow, Monterey, New Marlborough, New Salem, Northampton, Northfield, Orange, Pelham, Petersham, Sheffield, Shelburne, Tyringham, Turners Falls, Wendell, W. Brookfield, Williamstown, and Williamsburg

Existing conduit will be used in historic districts in: Springfield, Great Barrington, Pittsfield, Florida, and North Adams.

New Aerial & Direct Bury Lines: There will be no new poles or direct buried lines in historic districts.

Existing Buildings: Connections to existing Public Safety buildings will occur within historic districts in the following towns: Belchertown, Charlemont, Orange, and Becket.

Coordination with SHPO: The MA SHPO was contacted prior to submission of Phase 1. Given the large size of the project, the SHPO office was not able to provide detailed information on project area historic resources. As the design advances, coordination with the SHPO will continue to ensure that historic issues are addressed.

Coordination with THPO: The project area includes no federally recognized tribal lands.

Coastal Area

Relationship to Coastal Zone Management Boundaries: The entire project area is inland, and no part of the project is included within a coastal zone management area boundary.

Brownfield

Project Area Brownfields: According to the USEPA web site, there are 2 Superfund sites, 7 RCRA sites, and 37 other brownfield sites in the project area.

Use of Existing Facilities: No clearing of vegetation or substantial ground disturbance that may intercept contamination is necessary to complete cable installation on existing poles or in existing conduit.

New Aerial Lines: New poles will be within existing public rights of way and will be sited to avoid brownfields or potentially contaminated sites.

New Direct Bury Lines: Where direct burial is proposed, adjacent properties will be evaluated to determine the potential for oil or hazardous materials to have migrated into the right of way and appropriate testing will be completed. If contamination is encountered, an alternative route will be developed.

Equipment Cabinets: Equipment cabinets will not be sited on any brownfields or otherwise contaminated properties.

Conclusion: Due to the high degree of flexibility in placement of the new cable routes and the facilities associated with the system, and the ability to make use of existing aerial pole lines and existing underground conduits, the involvement of brownfields is not anticipated.

Submitted Date: 3/25/2010 8:07:44 PM	**Easygrants ID: 4722**
Funding Opportunity: Broadband Technology Opportunities Program	**Applicant Organization:** MASSACHUSETTS TECHNOLOGY PARK
Task: Submit Application - BTOP	**Applicant Name:** Mr. Mitchell Lash Adams

Uploads

The following pages contain the following uploads provided by the applicant:

Upload Name	File Name	Uploaded By	Uploaded Date
Service Offerings and Competitor Data	18.1 CCI Service Offerings and Competitor Data Attachment.xlsx	Adams, Mitchell	03/25/2010
Network Diagram	18.2 Network Diagram.pdf	Adams, Mitchell	03/23/2010
Build Out Timeline	Build Out Timeline.pdf	Adams, Mitchell	03/25/2010
List of Community Anchors and Points of Interest	18 4 CCI Anchor Detail and POI.xlsx	Adams, Mitchell	03/24/2010
Management Team Resumes and Organization Chart	MB123 Org Chart and Management Team Resumes.pdf	Adams, Mitchell	03/23/2010
Government and Key Partnerships	Government and Key Partnerships Part I.pdf	Adams, Mitchell	03/24/2010
Historical Financial Statements	18.7 Historical Financial Statements.pdf	Adams, Mitchell	03/23/2010
Budget Narrative	CCI MBI Budget Narrative.doc	Adams, Mitchell	03/25/2010

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Detailed Budget	18 9 Detailed Project Budget R2 format FINAL v3 (3).xls	Adams, Mitchell	03/25/2010
Pro-forma Forecast	MB123 Forma Financial Projections Attachment.xls	Adams, Mitchell	03/25/2010
Subscriber Estimates	Subscriber Estimates.xlsx	Adams, Mitchell	03/25/2010
Dashboard Metrics	18.12 CCI Key Metrics Dashboard Attachment.pdf	Adams, Mitchell	03/25/2010
Service Area Data	MB123 Service Area Details.xls	Adams, Mitchell	03/24/2010
Network Maps	MB123Network Maps.pdf	Adams, Mitchell	03/24/2010
BTOP Certifications	MB123 BTOP Certification.pdf	Adams, Mitchell	03/24/2010
SF-424 C and D	SF 424 C and D.pdf	Adams, Mitchell	03/25/2010
Supplemental Information	Supplemental Information, Key Assumptions and Government and Key Partnerships Part II.pdf	Adams, Mitchell	03/25/2010

Broadband Infrastructure Application
Submission to NTIA – Broadband Technology Opportunities Program

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