



## Environmental Assessment

Massachusetts **BROADBAND** Institute  
*Connecting the Commonwealth*

### **The *MassBroadband 123* project Western and North Central Massachusetts**

National Telecommunications and Information Administration  
Broadband Technology Opportunities Program  
1401 Constitution Avenue, N.W.  
Washington, D.C. 20230

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## FOREWORD

**Overview:** The *MassBroadband 123* project is being carried out by the Massachusetts Broadband Institute, a division of the Massachusetts Technology Collaborative (MTC)<sup>1</sup>, to provide broadband Internet access to over 120 communities in western and north central Massachusetts. Direct Internet service will be provided to approximately 1,400 community anchor institutions, which include public safety facilities, hospitals, community colleges, and libraries, and 22 interconnection points will be provided to facilitate interconnection by last-mile providers. The service network will involve approximately 1,000 miles of new fiber optic cable. The National Telecommunications and Information Administration has awarded a grant to fund this project through the Broadband Technology Opportunities Program as part of the American Recovery and Reinvestment Act. The Easy-Grant Identification Number is 4722 and the Award Number is **NT10BIX5570070**.

**The Massachusetts Broadband Institute:** The Massachusetts Broadband Institute (MBI) was created by the Commonwealth of Massachusetts in 2008 to extend affordable, robust, high-speed Internet access to all homes, businesses, schools, libraries, medical facilities, government offices, and other public places across the state. The *MassBroadband 123* project is the first major step in meeting the MBI's challenging goals.

**Conditions of the Grant:** The grant from the National Telecommunications and Information Administration requires that an Environmental Assessment be prepared to meet the requirements of the National Environmental Policy Act. The National Environmental Policy Act requires that federal agencies examine any reasonable alternative approaches to an action and consider the potential impacts of an action prior to making a final decision to proceed. The use of the federal funding being provided through the National Telecommunications and Information Administration is a federal action which is subject to the Act.

**Purpose of this Document:** This document is the Environmental Assessment for the *MassBroadband 123* project. The Environmental Assessment has been prepared under the guidance of the National Telecommunications and Information Administration to consider the impacts to the environment in compliance with the requirements of the National Environmental Policy Act. This document contains the results of alternatives analysis, project development work, project area inventory, environmental impact analysis, and consultation with agencies and the public that have been carried out to advance the project.

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<sup>1</sup> The legal name of the Massachusetts Technology Collaborative is Massachusetts Technology Park.

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## Executive Summary

**Introduction:** In 2008 Governor Deval Patrick and the Massachusetts legislature created the Massachusetts Broadband Institute (MBI) with a mission to improve broadband service throughout the Commonwealth and an initial focus on unserved and underserved areas in western and north central Massachusetts. In 2009 Congress passed the American Recovery and Reinvestment Act (ARRA) which included \$7.2 billion to fund broadband infrastructure improvements. In 2010, the MBI's *MassBroadband 123* proposal received a \$46.4 million grant award from the National Telecommunications and Information Agency's Broadband Technology Opportunities Program. *MassBroadband 123* has the goal of bringing affordable, high-speed Internet access to western and north central Massachusetts and connecting these regions to the rest of the state's digital economy. The *MassBroadband 123* project plans to deploy about 1,000 new miles of fiber optic cable to bring affordable, high-speed broadband to approximately 1,400 community anchor institutions. The project will provide between 50 megabits per second to 10 gigabits per second high-speed Internet service to public safety facilities, K-12 schools, community colleges, local and state government facilities, healthcare providers, and other institutions. Last-mile service providers will extend service from the interconnection points to households and businesses in the region. The total budget for the project is \$71.4 million. The extent of the proposed network is shown on Figure 1 – Project Overview Map.

**The Need for the Project:** The MBI was created as a result of an unsuccessful decade-long effort by broadband activists and municipalities in western and north central Massachusetts to obtain affordable high-speed Internet access. High performance broadband has become fundamental to the quality of life, ability to attract high technology companies and younger workers, access to advanced services, and economic development and growth. While eastern Massachusetts has a "high tech" economy, western and north central Massachusetts anchor institutions, businesses and residents have had little or no choice in broadband providers, and as a result have paid higher prices for lower levels of service. The low population density and the rugged topography in this mostly hilly, wooded region have deterred the investments by telecommunications companies that have taken place in more densely populated, less rural areas of the state. The *MassBroadband 123* network will address the need in this part of the Commonwealth to achieve parity with other areas of the state that do have the advantages that broadband Internet service provides. This project will provide the essential infrastructure to this population so that they can receive the public safety, health care, educational, and economic benefits and opportunities that the availability of Internet service is providing to other residents of the state.

**The Purpose of the Project:** The purpose of the project is to provide the middle-mile infrastructure needed to enable the opportunities that Internet service makes available for improved safety, well being, education, and economic growth to the businesses and residents of the project area by extending service and providing parity of service to the region. This purpose is completely in line with the national purpose of the Broadband Technology Opportunities Program to "...deploy new or improved broadband Internet facilities...and to connect 'community anchor institutions'..." The project is intended to provide competitive and affordable service opportunities for businesses and residents which are not available today. This purpose

will be accomplished by providing middle-mile Internet infrastructure to economically distressed, un-served, and underserved communities in the project area, and to public safety facilities, healthcare providers, schools, community colleges, libraries, government offices, and other community anchor institutions.

**Description of the Proposed Action:** The *MassBroadband 123* project will provide a middle-mile fiber optic network of approximately 1,000 miles of fiber optic cable in western and north central Massachusetts to meet the broadband service needs of the region. The cable will be put in place using existing infrastructure to the extent possible. Cable on existing utility poles will account for about 98% of the route miles of the system, cable in existing underground conduit will account for about 2%, cable on new utility poles will account for about 0.2%, and there will be a small amount of cable in new underground conduits. Most of the cable used for the system will be about a half inch in diameter. The proposed system will incorporate two existing Internet gateways – one in Springfield and one in Boston - and 22 interconnection points located throughout the project area. Last mile Internet service providers will bridge the gap between the interconnection points and the households and businesses in the project area. The interconnection points will typically consist of electronic equipment on racks within an existing building, an equipment cabinet on the exterior, and an emergency generator and standby fuel tank on the exterior. The system will provide a direct connection of fiber to approximately 1,400 community anchor institutions. Connections to the buildings of the community anchor institutions will either be aerial or underground depending on the nature of the existing building utility connections. The system will use proven industry standard technology to provide affordable industry standard solutions. These technologies will include Dense Wave-Division Multiplexing to provide high capacity, SONET to provide telephone and radio services, Ethernet to provide traditional network connectivity, and optical interfaces to provide speeds of 50 megabits per second to 10 gigabits per second.

**The Alternatives Considered:** The alternatives that were considered to meet the project purpose were:

- The No Build Alternative,
- The Commercial Subsidy Alternative,
- The Provide Broadband Service through a Fiber Optic Network by Installing Cable Using Existing Conduit and Pole Infrastructure Alternative,
- The Provide Broadband Service through a Fiber Optic Network by Installing Aerial Cable Using Existing Pole Infrastructure with New Poles Where Necessary Alternative
- The Provide Broadband Service through a Fiber Optic Network by Installing Cable Underground Alternative, and
- The Provide Wireless Broadband Service through a Network of Radio Towers Alternative.

The alternative “Provide Broadband Service through a Fiber Optic Network by Installing Cable Using Existing Conduit and Pole Infrastructure” was found to best satisfy the project purpose. This alternative for the *MassBroadband 123* project will meet the need to provide Internet



service to project area residents so that they can receive the benefits and opportunities that the availability of Internet service is providing to other residents of the state. The reliance on cable routes on existing utility poles and conduit, supplemented only as needed by cable on new poles and underground cable in new conduits, will minimize impacts to the natural environment. This alternative represents the only economically feasible approach to providing the levels of service required.

**Environmental Consequences:** The use of existing conduit and pole infrastructure for the installation of cable over the vast majority of the network results in limited environmental consequences. Most of the impact concerns relate to carrying out the construction process; the system in place and in operation has very limited environmental impacts.

- **Noise:** There are potential temporary noise impacts related to construction activities. However, almost all construction will take place during daytime hours and no extraordinarily noisy activities are involved. Because this is a linear project, construction noise will not be taking place in the same work area for an extended period of time. Commonly used practices are available to control construction noise – such as appropriate equipment maintenance, limitations on idling, and work hour restrictions. Potential permanent noise impacts are related to generator operation at the 22 interconnection points. The generators will only be activated in the case of a power outage and for periodic testing. Interconnection points will typically be located on publicly owned property away from sensitive receptors.
- **Air Quality:** The potential temporary air quality impacts are related to construction equipment emissions and dust related to construction activities. Along the linear project, construction related air quality impacts will not involve the same work area for an extended period of time. Commonly used practices are available to control emissions and dust – including appropriate equipment maintenance, limitations on idling, limits on the extent of soil exposure, and the wetting down of exposed surfaces. Potential permanent air quality impacts are related to emissions from generator operation at the 22 interconnection points. The generators will only be activated in the case of a power outage and for periodic testing. Interconnection points will typically be located on publicly owned property away from sensitive receptors.
- **Geology and Soils:** The potential temporary impacts of the project are erosion and sedimentation resulting from construction activities. With construction activity not based in any one location for an extended period of time there is less likelihood of topsoil damage and erosion. Commonly used practices are available to control erosion and sedimentation – including straw bales and siltation fences. Potential permanent soils impacts are the loss of valuable land area. No permanent impact is anticipated in any sensitive area as a result of the project. The land area necessary for new telephone poles and concrete equipment pads for equipment cabinets, emergency generators, and standby fuel tanks will be very small. These project elements will be located to avoid the use of any valuable resource or productive area.

- **Water Resources:** The potential temporary impacts of the project are damage to wetlands from construction activity. While the cable installation operation on existing utility poles and new utility poles will pass close to wetlands in many locations, there is only one location where construction impacts cannot be avoided. This is at a wetland crossing of an unimproved roadway that parallels an existing pole line. This pole line leads up to a tower at Mount Wilcox in Monterey. In order to install cable along this existing pole line there will be a temporary impact to as much as 3,600 square feet of emergent wetland that is located within the roadway. Swamp mats and other protective measures will be used to minimize the temporary wetland impacts. The area will be restored at the completion of construction. The potential permanent impacts of the project are the permanent loss of wetlands or the filling of floodplains. There are no permanent impacts to wetlands associated with the project. There are several locations where new pole lines will cross floodplains or new interconnection points will be located in floodplains. Since the area around the new poles, equipment cabinets, and generators will remain in its original configuration, the only loss of floodplain storage volume is related to the volume of the poles and the equipment themselves. This loss of volume is very minor.
- **Biological Resources:** The potential construction impacts of the project to biological resources are fuel spills that could threaten sensitive habitat, equipment movement that could destroy plant life and immobile animal life, and tree trimming around cable lines. A spill prevention and emergency response plan will be in force to decrease the likelihood of fuel spills. The primary mitigation measure for damage by equipment movement is to identify and avoid sensitive habitat. The US Fish and Wildlife Service has determined that the *MassBroadband 123* project is not likely to affect federally listed endangered species and the preparation of a Biological Assessment or further consultation under Section 7 of the Endangered Species Act is not required. The appropriate construction measures for sensitive habitats will be developed with the Massachusetts Natural Heritage and Endangered Species Program. Any significant tree trimming that is necessary will be carried out in consultation with either the individual communities for local roadways or the Massachusetts Department of Transportation for state roadways under the provisions of the Massachusetts Shade Tree Law. No permanent impacts to biological resources are anticipated.
- **Historical and Cultural Resources:** The potential construction impact on historic and cultural resources is the destruction of archaeological resources by the placement of new utility poles or trenching for underground conduit. Areas of potential archaeological resources will be identified and avoided. A protocol will be established to deal with any archaeological resources that may be unexpectedly encountered during construction operations. The potential permanent impact of the project on historical resources would be the incompatibility of a new project feature with an historic resource. There are no new poles lines proposed in any historic areas and there are no plans to place conduit on any historic bridge. The equipment cabinet, emergency generator and standby fuel tank at the interconnection points will typically be placed near modern, utilitarian buildings. There are four exceptions. In Orange the interconnection point will be at the

Orange Fire Department Building which may have historic value. In Pittsfield it will be at the State Office Building on East Street which may have historic value. In Sturbridge it will be at the State Police Barracks which may have historic value. At these three locations there is no nearby alternate location. In these situations the equipment cabinet, generator, and fuel tank will be placed in as inconspicuous a location as possible in consultation with the state and local historical commissions. In Russell the interconnection point it will be at the Town Data Center, which has an existing generator.

- **Aesthetic and Visual Resources:** The potential construction impact on aesthetic and visual resources is the removal of a significant amount of vegetation. The removal of vegetation will be avoided to the extent possible: Any significant vegetation removal which is necessary will be reviewed with the community and the Massachusetts Department of Transportation in conformance with the Massachusetts Shade Tree Law. The potential permanent impact of the project on aesthetic and visual resources would be the incompatibility of a new project feature with the area. There are no segments of new pole line proposed along roadways that are designated as Massachusetts Scenic Byways. There are no plans to place any conduit on a bridge, but should it be required the conduit will be placed in as inconspicuous a manner as possible. The equipment cabinet, generator, and fuel tank at the interconnection points will typically be placed near modern, utilitarian buildings. Consultation will take place with the communities if any question of aesthetic and visual impacts arises.
- **Land Use:** The potential impact of the project on land use is that property may be used for the project that is more suitable for another use. Property used for new pole lines will typically be roadway or utility rights of way and the property used for the equipment cabinets, generators, and fuel tanks at the interconnection points will typically be community owned or utility owned property. The use of these areas for the project is an appropriate use of areas that would typically not be available for another type of use. Consultation will continue to take place with the communities regarding appropriate impact mitigation for elements of the project.
- **Infrastructure:** The potential impact of construction on infrastructure is that underground utilities could be damaged by new pole placement or trenching for underground conduit. The underground utilities in the project area will be identified through research and DigSafe and existing utilities will be avoided. There will be a protocol in place for an unexpected encounter with an underground utility.
- **Socioeconomic Resources:** There would be an inequity if either the benefits of the project were denied to low income areas or the impacts of the project were unfairly concentrated in low income areas or among Environmental Justice Populations. Both the benefits of the project and the minor inconvenience associated with construction activity are distributed equally throughout the project area, including Environmental Justice areas.

- **Human Health and Safety:** Some of the activities involved in the construction of the project are inherently dangerous such as work in roadway rights of way and work at height. Best practices for workplace safety will be used throughout the construction project. The system in operation presents very little in the way of potential impacts to health and safety. The system is largely noiseless and emission less and presents no attractive nuisances. The only exception is the emergency generators at the 22 interconnection points which will generate noise and emissions and will have a propane or diesel fuel tank. The generators will only be activated in the case of a power outage and for periodic testing. Interconnection points will typically be located on publicly owned property away from sensitive receptors and out of normal paths of travel.

**Findings and Conclusions:** The alternative “Provide Broadband Service through a Fiber Optic Network by Installing Cable Using Existing Conduit and Pole Infrastructure” is the most effective approach for meeting the project purpose of providing Internet access to economically distressed, un-served, and underserved communities in the project area, and to public safety facilities, healthcare providers, schools, community colleges, libraries, and other community anchor institutions. The project involves limited environmental impacts that can be managed through design, construction, and system operations best practices. It provides the highest level of benefits at the least cost and impact. There are sufficient management and regulatory programs in force to assure that these best practices will be implemented.