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# RESPONSE

FOR THE

## **WESTERN MASSACHUSETTS CALL FOR SOLUTIONS ENGINEERING AND PERMITTING REVIEW FOR THE CONSTRUCTION OF A BROADBAND INFRASTRUCTURE SYSTEM**

SUBMITTED TO

**MASSACHUSETTS BROADBAND INSTITUTE**  
c/o MASSACHUSETTS TECHNOLOGY COLLABORATIVE,  
75 NORTH DRIVE  
WESTBOROUGH, MA 01581

ON

DECEMBER 19, 2008

BY



**ADESTA®**

1200 Landmark Center, Suite 1300  
Omaha, NE 68102  
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December 18, 2008

Massachusetts Broadband Institute  
C/o Massachusetts Technology Collaborative  
75 North Drive  
Westborough, MA 01581

**RE: Massachusetts Broadband Institute Call for Solutions**

To Whom It May Concern:

Adesta, LLC (Adesta) is pleased to submit our response to the Massachusetts Broadband Institute (MBI) Call for Solutions. Adesta has provided information on how MBI can implement and deploy its initiative to expand broadband into the un-served and under-served areas of Western Massachusetts.

Since 1988, Adesta has deployed more than 2 million miles of fiber. Adesta develops green-field network, or can integrate into existing infrastructures. We offer fiber optic services including design, installation, fusion splicing, and documentation.

Adesta's engineering and design teams, efficient project management, and operations and maintenance services create lasting value for our customers. With over 140 metropolitan and rural networks successfully deployed throughout the country, Adesta can rapidly integrate these types of infrastructures, large or small. Adesta is a founding member of the Fiber-to-the-Home Council, and specializes in last mile and broadband solutions for ILECs, CLECs, utilities, municipalities, large integration firms, and rural associations.

Our services include: Fiber-to-the-Premise (FTTP) design and deployment; route engineering and planning; splicing, testing and activation fiber optic; installation aerial and underground; Geographic Information Systems (GIS) modeling; hardware and software integration; manhole and duct inventory; Main Distribution Unit (MDU) inventory and design; MDU construction and installation; as-built documentation; network maintenance; training and certification; and consultation.

Adesta completed a 700-mile open access fiber optic network in Southern Virginia for the Mid-Atlantic Broadband Cooperative. We are currently working with the Maryland Broadband Cooperative on a similar network. Adesta's turnkey scope of work includes the engineering, design, and construction of a proposed 800+ mile network. The goal of these networks is to provide rural communities access to competitive broadband communication providers and serve as economic stimulus to attract new technology jobs to their regions.

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Adesta works with Northern Enterprises to design, engineer, and project manage the installation of a 400-mile open access fiber optic network in Northern Vermont. Currently, Northern Vermont has limited, affordable broadband communications services. The network, called North-Link, will provide this rural region a backbone for high-speed Internet access allowing for economic growth, development, and sustainability.

Adesta has further expanded its services in rural broadband deployment with our current project for CBN Connect. CBN Connect is developing a sustainable wholesale "open-access" broadband network. This network is a public-private partnership that delivers broadband services to the Adirondack Region, enabling future economic development. Adesta provides the design and detailed engineering of this 443 mile fiber network. The network will be deployed in the Adirondack Region of New York State throughout Essex, Franklin and Clinton Counties giving the area the capacity to deliver broadband services to its residents, businesses, municipal buildings, healthcare providers and educational institutions. Adesta will provide a scalable network with the required bandwidth for access to global information, resources and markets beyond the boundaries of the Region.

Adesta views this project as a partnership with the Owner from concept and implementation to providing operation and maintenance as well as future expansions. For MBI's initiative, the overall objective is to expand broadband into the region of Western Massachusetts to provide opportunities for economic development and resources to the private sector to deploy its services in the area. Adesta has built these "shared resource" and open access projects throughout the country. For instance, Adesta has constructed and is maintaining projects along the toll roads for New York State Thruway Authority, New Jersey Turnpike Authority, and the Illinois State Highway Toll Authority. We have also built and are maintaining a similar project for Colorado Department of Transportation (DOT). These networks provide the agencies with recurring revenue due to the marketing of dark fiber/ spare duct. This experience puts Adesta at the forefront of these types of implementations.

Adesta looks forward to the opportunity to provide a well-qualified response for MBI's Call for Solutions and the opportunity to grow this partnership beyond the initial phase. We sincerely believe that we will enhance the overall value of this initiative.

Thank you for this opportunity.

Sincerely,



Kevin Glynn  
Business Development Manger

## Solution Cover Sheet

Name of Respondent Organization <b>Adesta, LLC</b>			
Mailing Address <b>1200 Landmark Center, Suite 1300</b>	City/Town <b>Omaha</b>	State <b>NE</b>	Zip Code <b>68102</b>
Telephone <b>(402) 233-7700</b>	Fax <b>(402) 233-7650</b>	Respondent Web Address <b>www.adestagroup.com</b>	
Name of Primary Contact (Individual) <b>Kevin Glynn</b>			
Primary Contact Title <b>Manager, Business Development</b>		Contact e-mail address <b>kglynn@adestagroup.com</b>	Direct Telephone # <b>(908) 453-3979</b>
Which of the following best describes the respondent: (You must select at least one)			
<input type="checkbox"/> Broadband Service Provider <input type="checkbox"/> Government Organization <input type="checkbox"/> Equipment Manufacturer <input type="checkbox"/> Non-profit Organization <input type="checkbox"/> Equipment Vendor <input type="checkbox"/> Owner of Physical Assets (please specify Asset: _____ _____)		<input checked="" type="checkbox"/> Network or Systems Integrator <input type="checkbox"/> Interested Individual <input type="checkbox"/> Investor/Venture Capital <input type="checkbox"/> Consultant <input type="checkbox"/> Advocacy Group <input type="checkbox"/> Other (please specify Other: _____ _____)	
Brief Description of Organization (please outline previous experience with broadband deployment and/or provision of broadband services)			
<p>Since 1988, Adesta has deployed more than 2 million miles of fiber. Adesta can help develop a green-field network or integrate into an existing infrastructure. We provide a wide range of fiber optic services including design, installation, fusion splicing, and documentation. Over the years, broadband deployments have begun to occur in rural regions of the country. Adesta has been involved in these deployments. Adesta completed a 700-mile open access fiber optic network in Southern Virginia for the Mid-Atlantic Broadband Cooperative. We are currently working with the Maryland Broadband Cooperative on a similar network in Maryland. Adesta's turnkey scope of work includes the engineering, design, and construction of a proposed 800+ mile network. The goal of these networks is to provide rural communities access to competitive broadband communication providers and serve as economic stimulus to attract new technology jobs to their regions. Adesta also was chosen to work with Northern Enterprises to design, engineer and project manage the installation of a 400-mile open access fiber optic network in Northern Vermont where there is currently limited, affordable broadband communications services. The network, called North-Link, will provide this rural region a backbone for high-speed Internet access allowing for economic growth, development and sustainability. Adesta has further expanded its services in rural broadband deployment with our current project for CBN Connect. CBN Connect is developing a sustainable wholesale "open-access" broadband network via a public-private partnership to deliver broadband services to the Adirondack Region, enabling future economic development. Adesta is providing design and detailed engineering of this 443 mile fiber network. The network will be deployed in the Adirondack Region of New York State throughout Essex, Franklin and Clinton Counties, providing the area with the available capacity to deliver broadband services to its residents, businesses, municipal buildings, healthcare providers and educational institutions. It will also provide a scalable network with the required bandwidth to provide access to global information, resources and markets beyond the boundaries of the Region.</p>			
List of anticipated partner organizations <b>Adesta has not determined it team or partners for the future response at this time.</b>			

## **1.0 TECHNICAL MODEL AND APPROACH**

### **1.1 What technical approach is most appropriate and why?**

Western Massachusetts is a rural area where providing broadband access will require employment in a phased approach. Also various types of infrastructure must be considered depending on right of way availability and terrain. For the Massachusetts Broadband Institute (MBI), the deployment of fiber optics and wireless infrastructure (towers) will initiate coverage and backhaul ability for private industries to deploy services. The construction of this infrastructure will allow the Commonwealth, through MBI, to invest in long-term assets. Doing so falls in line with its need for long-term assets against the general obligation bonds. For providers seeking to provide competitive services to these underserved areas, the MBI backhaul infrastructure will offset the major cost in constructing a network. This will reduce the capital cost outlay to providers and allow them to focus on last mile deployment within specific towns. The fiber infrastructure will be open access and includes a dark fiber network. Fibers can be leased by providers on long-term 20-year Indefeasible Right of Use (IRUs) agreements. The same lease terms can occur for space on towers and huts for wireless deployment. By deploying this level of infrastructure, the on-going maintenance requirements by MBI will be manageable as the focus is on the physical infrastructure and not managing down to the lambda level.

With a high level review of the area that needs these services, a fiber infrastructure can be deployed in a ring topology with sub-rings and laterals to feed the areas depicted in the Western Broadband study. Prior to full engineering and network topology occurring, the main ring might run along Route 2 from east to west. It will also run within a spare conduit along the I-91 backbone being deployed by MassHighway with a link to One Federal in Springfield, an east/west route along I-90 with potential usage of fibers from Mass Turnpike or other route A north to south link along Route 7 will close the main backhaul ring. The routes along Route 7 and Route 2 would mainly be aerial depending upon pole condition, make ready requirements, etc. A feasibility study and outside plant engineering design is required to determine the most advantageous routes based upon construction costs and infrastructure availability while penetrating the towns/areas that have been noted in the Broadband study.

### **1.2 What specific services and product offerings be available beyond entry level, commercial Internet access (e.g. video, telephone)?**

The services and product offerings that we anticipate using include voice, high speed Internet, cable television and wireless services. Providers from the private sector that will use the infrastructure to service multiple towns as well as backhaul traffic to central office locations/telco hotel(s) will deploy these offerings.

### **1.3 What service and speed levels are achievable with your conceptual approach?**

The service and speed levels are only limited by the electronics that the provider chooses to place on the infrastructure and the service level they offer. By MBI deploying the physical assets, the infrastructure life cycle is long and is completely scalable. Speeds from voice level circuits to 40 GB will occur with fiber optics. The wireless infrastructure, such as towers, enables providers to deploy a variety of wireless services including point to point, point to multi-point or mesh networks. The wireless deployment aggregates back to the fiber network.

## **2.0 BUSINESS MODEL AND APPROACH**

### **2.1 What business models should be used or considered in the deployment of broadband?**

For MBI, the deployment of long term assets will provide the “road map” for providers to penetrate the regions that are un-served or underserved. The MBI business model is to deploy assets to develop the backbone and infrastructure needed to serve these areas and provide connectivity back to main central offices or telco hotel such as One Federal in Springfield, MA. The cost of the assets will be deployed using MBIs funds generated from the \$40 Million in general obligation bonds. Once the network is deployed, MBI will lease the assets using the IRU model. These lease terms and the fees charged to the providers will provide funds to provide management and maintenance of the network, and potential expansion funds. The fees charged to the providers will be set at a rate based on “cost avoidance”. These fees will be far less than the capital required by providers to deploy networks individually. The specific providers would then handle the last mile cost.

### **2.2 What conditions and services are necessary for a sustainable business model?**

The conditions necessary for a sustainable business model is determining the percentage of take of fiber within the network by potential providers/carriers. The services necessary for the sustainable model are long-term assets with minimal operational requirements for MBI to manage.

### **2.3 What are the implications of mandating that the Broadband Institute’s expenditures be used to fund a network that is in part or whole available to other commercial providers at wholesale marketing price? How should those wholesale prices be set?**

By mandating that MBI’s expenditures are to be used to fund a network in part or whole available to all providers, MBI has set itself apart from being in competition with existing

carriers. The MBI network gives new providers the opportunity to access these regions at a better rate as well as provide the ability for incumbents to use portions of the network to extend their reach as well.

### **3.0 SERVICE AREA**

#### **3.1 Can your conceptual approach reach all un-served citizens in western Massachusetts?**

Our conceptual approach can reach all un-served areas with fiber and tower deployment. This model can best reach all un-served towns by providing fiber routes as the backhaul between areas as well as back to main central offices and telco hotel. From the fiber backbone, either additional laterals or subloops can penetrate the towns. In the town areas, some towers can be deployed to minimize costs of fiber deployment as well as support the last mile build of providers. The fiber deployment does not reach every house at their location. This last mile will need to be supported by the potential providers that are looking to be part of a public private partnership. By supporting the main backbone and tower, infrastructure, the Commonwealth can decrease the costs for providers and help increase the return on investment. Furthermore, by deploying these assets, the maintenance is basic to the infrastructure and the Commonwealth does not have to get in to the business of being a wholesale carrier, where operational costs and service level agreements become burdensome.

#### **3.2 If your conceptual approach reach all un-served citizens of western Massachusetts, in what towns and areas would you expect to deploy a broadband network, and what percentage of households would you anticipate serving?**

The answer to this question depends on the provider(s) looking to enter the towns/areas. By deploying a fiber backbone, provider(s) can concentrate on the capital cost to build infrastructure within the last mile. which is traditionally the highest cost. The percentage of households to serve and type of services would need to be determined by the provider from performing surveys of those businesses/residents that reside in the towns.

### **4.0 PARTNERSHIPS**

#### **4.1 Could your organization provide end-to-end services or would it partner with other organizations?**

Our organization does not provide end-to-end services. The model we propose to Commonwealth is to develop a network that is open access and managed by a third party who is not a service provider. By having this management performed by a non-

provider, Commonwealth is assured fair competition within the un-served markets and the initiatives of the project stay with Commonwealth.

#### **4.2 How would you envision and arrange such partnerships?**

The partnerships should be formulated by MBI for providers to deploy their services within the towns using Commonwealth's infrastructure. The project should be developed on a phased approach with a conceptual network design to reach the un-served areas. From this, a letter of intent to use the network or portions of the network should occur prior to deployment. By doing this, partnerships are solidified and the network can be deployed in a fashion as to build the areas that have the interest to start. Furthermore, MBI can work with specific providers to develop an overall strategy to deploy in numerous areas, to meet coverage needs and provide discounted costs for the IRUs to have this occur.

#### **4.3 What role should the Broadband Institute play with regard to inducing or enabling the formation of partnerships?**

See above.

### **5.0 FINANCING**

#### **5.1 What long-lived assets would be appropriate for the state to invest in, and which privately-owned assets will complement that state investment?**

Long-lived assets the state should invest in would be fiber optic plant, towers, and if required, regeneration or collocation facilities. These assets have long-lives and are not subject to electronic/software upgrades. This also helps minimize operational and maintenance costs. Privately owned assets would encompass the electronics and last mile requirements for deployment of services.

#### **5.2 What investment structure is appropriate and why?**

The investment structure will be for the Commonwealth to use their funds to engineer, construct and maintain a fiber and tower infrastructure. This infrastructure can then be leased to providers on low cost long term IRUs with yearly maintenance fees. These low cost IRUs can be constructed to either minimize cost of the initial outlay or support MBIs operational budget for the assets during its life cycle. Yearly maintenance fees will support the yearly maintenance program to handle preventative maintenance schedules, monitoring of the network, locating of network plant under Massachusetts one-call system, emergency restoration, and moves/adds/changes.

**5.3 How and on what terms should the Broadband Institute structure the deployment of the publicly owned assets for use by participants?**

The Broadband Institute should consider structuring the deployment of the assets in a phased approach. This should occur based on several factors. The first factor is the ability to construct the portions of the network in timeframes based upon availability of rights of way. The second factor is to determine that priority areas can be based on the number of providers seeking and committing to deploy in town(s) or regions.

**5.4 What is your perception of the Broadband Institute's financing structure for investing and owning assets required to serve un-served areas to the Commonwealth?**

Our perception of the financing structure is to deploy assets that will have long-term value for the Commonwealth. Investing in this infrastructure mitigates those costs for deployment by providers.

**5.5 What other sources of capital are available to support your conceptual model? How much capital is required to implement the proposed conceptual approach?**

Other sources of capital that we are familiar are EDA or RUS funding in rural broadband deployment. There are also funds made available from the FCC for Rural Health Networks.

Adesta is currently involved in several projects that use these types of funding. These projects include:

- Northlink,
- Maryland Broadband Cooperative
- CBN Connect
- Eastern Shore Virginia Broadband Association
- Iowa Rural Health Network

**5.6 What experience do you have in raising capital from these alternative sources?**

Our experience has been working with our customers who raise capital from these sources.

**6.0 PUBLIC ROLE****6.1 How should the performance of the Broadband Institute's investments be monitored?**

The performance of the Broadband Institute's investments should be monitored by several factors.

1. Integrity of network. This would be measured by occurrences where an outage/incident occurs where a trouble ticket was sent and an action taken. This will measure how well the network is monitored, constructed, and maintained.
2. Another performance measure would be on the amount of fiber being leased as well as space on towers and regeneration space being leased. This measures the usage of the network by providers.
3. A performance measure should be developed by ascertaining data from providers on customer base in each town. With this should be a map of their last mile coverage area.

**6.2 What reporting requirements are appropriate for service providers?**

Providers will look to the Broadband Institute to have a single point of contact for all maintenance and service issues on the backbone fiber network or with the wireless infrastructure. A single point of contact that is not providing service to the area provides an independent entity that is neutral and provides consistent and fair service to all providers. The providers will be given a 24 hour service number.

**6.3 What public sector demand evaluation and stimulation efforts are appropriate?**

Adesta does not have a response to this question.

**7.0 OTHER****7.1 What provisions should be included in the agreements to build the necessary infrastructure?**

An independent third party, who is not providing service to the area, should provide the engineering, construction and maintenance of the network. This would allow the Broadband Institute oversight and approval of the usage of funds and would keep all prospective providers on a competitively neutral basis.

**7.2 What provisions should be included in the agreements governing the use of the infrastructure?**

An independent third party, who is not providing service to the area, should provide a single point of contact for all providers on the network. This independent third party would be the responsible party to access the fiber backbone or the wireless infrastructure. This provides a clear demarcation for all providers and a single point of contact for all maintenance and access requirements. In addition, the Broadband Institute can develop contractual language with the third party to make them responsible for ongoing maintenance.

**7.3 What are the essential questions that must be resolved for the respondent so as to better inform them on the applicability of various solutions?**

Adesta does not have a response to this question.

**7.4 What are the non-financial constraints to network deployment?**

There are really no specific non-financial constraints to network deployment since any defined constraint leads to a financial decision. Constraints such as existing topography, population density, timeframe to construct, weather, make ready, etc. all tie back to a financial impact to the deployment.

**7.5 What information can you provide to give the Institute a better understanding of where specifically broadband is currently available and where it is soon-to-be available?**

We would assume that from what we have seen when other broadband initiatives are announced that there will be announcements from incumbents that various types of broadband will soon-be-available in many parts of the subject area.

**7.6 Are there other deployments or models used in other areas of the country of globe that could be applicable to the situation and challenges in western MA?**

We have been involved in a number of deployments of infrastructure to benefit the deployment of broadband and also stimulate economic development. Our level of involvement ranges from providing engineering and design services to constructing the network to maintaining the network and finally to marketing the asset and negotiating IRU agreements. We would be willing to discuss these deployments and models in detail with the Broadband Institute.

**\*\*\* End of Response \*\*\***