



September 21, 2015

To: Elizabeth Copeland
Associate General Counsel, Massachusetts Technology Collaborative &
Deputy Director, Massachusetts Broadband Institute
75 North Drive
Westborough, MA 01581

Dear Elizabeth,

In reply to your request for additional information to our submission to the MBI's RFQ 2015-MBI-03 below please find our responses.

1. Clarification of cost/financial contribution by Matrix:

The Town of Montague - Our investment would be the equivalent of \$566,640 in goods, services and operational start up costs, representing the cost to install fiber network along 17.6 miles of road and install up to 173 house drops.

The Town of Hardwick - Our investment would be the equivalent of \$588,480 in goods, services and operational start up costs, representing the cost to install fiber network along 19.2 miles of road and the 164 identified house drops. We have been told that the number of unserved homes along this 19.2 mile route should exceed 164 but the Broadband Committee was only able to positively identify and map 164 unserved homes.

Matrix would also be responsible for all ongoing maintenance and operational costs.

2. Additional information on network operation by Matrix:

EC Fiber and ValleyNet - Matrix Design Group provided the prototype design along with engineering, construction and operational services for the community-owned Fiber-To-The-Home network. Matrix also provided significant financial investment towards building the network, connecting rural homes and businesses throughout East Central Vermont in the towns of Barnard, Bethel and Royalton. Phase one of the project was located in the most rural part of the region and encompassed 23 miles of the towns roads, serving 220 subscribers. The network has grown to more than 390 miles of roads that are either built or in the process of being built, serving more than 1200 homes.

For additional information on our role with EC Fiber and ValleyNet please contact:

Stan Williams
ValleyNet
415 Waterman Road
South Royalton, Vermont 05068
802-763-2262

Town of Leverett, Matrix and Millennium provided complete turnkey installation services and support for a fully operational FTTH network for the town of Leverett. This support included make ready walk out and oversight, final network design, engineering services,

aerial and underground construction for 39 miles of network, installation services for 812 homes. Complete provisioning of an Active Ethernet optical platform connecting each customer, provisioning, and final network acceptance and turn over.

For additional information on our role with the Town of Leverett please contact:

Peter d'Errico
derrico@wildblue.net

Comcast – Three founding partners of Millennium and Matrix, along with several key staff members, were invaluable members of one of the largest single cable systems in the United States, which ultimately became the flagship system of what is now Comcast.

Each of these key members had supporting roles in each of the disciplines necessary for building a successful start up, including Finance, Marketing, Operations, Design and Construction. Starting with a single town franchise with 105 road miles and 26,000 homes, the team, including the founding members of Millennium/Matrix, built a Greenfield network of 42 towns with 2,800 miles of plant and 400,000 subscribers. This system was renowned nationwide, as an innovator, deploying the earliest known fiber network systems, systems the founding partners of Millennium/Matrix were responsible for developing.

In addition Matrix and Millennium have built more than 80 municipal networks in New Jersey where the Internet backhaul and VoIP extensions would be similar in scope to many of the small rural towns in Western Mass.

3. Operation and sustainability of proposed networks:

As mentioned above, Matrix and Millennium remains actively involved in the operation and growth of the EC Fiber / ValleyNet system and Matrix and Millennium is under contract to provide maintenance to the Town of Leverett's fiber build for the next year. EC Fiber is community owned and LeverettNet is Town owned so profitability is not the goal of either network. However, both networks have been very successful as evidenced by the take-rate in Leverett of over 70% of the homes passed and EC Fiber's growth from just 150 homes taking service to over 1,200 subscribers.

Matrix and Millennium have been named one of the Top 100 FTTH Companies in the United States by *Broadband Communities* magazine.

4. Clarifications of operations roles:

For the networks described above the roles for Matrix and Millennium have included fiber design, the fiber build and the fiber maintenance. For the networks we are proposing for the Towns of Montague and Hardwick our roles would also include that of service provider. There are three main components to being an ISP – the back office technical running of the network, the customer service interface with the subscriber and customer billing.

In regards to technical competence, here is a partial list of some of our present and past customers – many of whom we provide mission critical technical services:

AboveNet Communications

Aguilar Environmental



Adesta Communications
Allegiance Telecom, Inc.
AT&T Local Services
Allied Signal
Cable & Wireless USA, Inc.
Clearstream Communications, Inc.
Columbia Transmission Corporation
Connecticut Department of Transportation
County Of Morris
Enron Broadband
Fast Track Construction
Fluor Global
GTS Network Limited
J. Fletcher Creamer & Son
Lightpath
Lucent Technologies
MCI WorldCom Network Services
Millennium Communications Group
Marriot International
NorthEast Optic Network, Inc.
New Jersey Dept. of Transportation
Peter Kiewit & Sons Construction
Rutgers University
Southeastern University Research Association
Sprint PCS
Telia
Verizon Communications
Wildlife Conservation Society
Zayo Group

Arbros
Bechtel Telecommunications
Chalet Suisse Motels
Cablevision
Citicorp
Con Edison Communications
Crystal Springs Builders
Charter Ridge
ExtraNet Communications
FiberNet Telecom Group
G4S Technologies
Geographic Network Affiliates Int'l
Insignia/ESG
Level (3) Communications
Looking Glass
Mansion Ridge Golf Course
Metromedia Fiber Network Services
New York State Unified Courts
Nabisco, Inc.
Novartis Pharmaceuticals
OnFiber
Qwest Communications
SNET
Sprint Communications
Switch & Data Facilities Co.
Time Warner Telecom
Verizon Wireless
XO Communications

In regards to providing customer service, in addition to being able to service the technical requirements of customers like the above, Matrix will also be implementing the Consumer Connect offering from Calix as part of our builds in Montague, Hardwick and the other Western Mass towns we hope to build.

Calix is the number one provider of fiber access gear in the world. Their Consumer Connect offering will give Matrix customer service capabilities above and beyond any cable provider in the Commonwealth (see attached brochure). For more information on our relationship with Calix and to vouchsafe our capabilities and competence when it comes to municipal deployments please feel free to contact Dave Russell:

David Russell
Solutions Marketing Director
(763) 268-3337
david.russell@calix.com

Finally, in terms of being able to handle customer billing each year Matrix and Millennium handles more than \$20 million in customer billing. We know the importance of accurate and timely billing.

5. Project sustainability:



It has been our experience that in rural builds where the only customer options are DSL or satellite based Internet service – the take rates are in the range of 70-80% of homes passed. In Montague that would equate to 121 or more homes taking service while in Hardwick it would equate to 115 or more homes. Our models have a break-even point of on average 6 homes per mile built. In Montague that would equate to about 106 homes taking service while in Hardwick it would equate to about 115 homes taking service. The business plan in Hardwick is tight but it should be offset by our request of the \$82,000 subsidiary from the MBI and also by the additional unserved homes that are along the fiber route but not on the initial map provided by the Broadband Committee.

We are well aware that there is risk involved in both of these builds but after working for months with the residents of both Montague and Hardwick we feel confident in the success of both plans.

It should be pointed out that Montague and Hardwick feel equally confident about Matrix.

I hope the above supplemental information satisfied your requirements. We look forward to working with the MBI on this and many more projects.

Sincerely,

Chris Lynch
Director of Business Development, Northeast





Connect and manage GigaCenters: Reduce OPEX, increase revenue and customer satisfaction

Compass Consumer Connect for GigaCenter (CCFG) equips communications service providers with a management platform that greatly facilitates your subscribers' ability to connect to and leverage your broadband network. By simplifying the process of adding GigaCenters to the network and extending the visibility and reach into each subscriber's home, service providers can enjoy significant improvements in customer satisfaction, reduced operational costs, and new potential revenue streams associated with consumer Home IT Management services. Reduced operational costs occur even if you do not offer this service as customer trouble calls occur for Wi-Fi whether you offer a service or not.

CCFG is an easy-to-use cloud-based application that makes it simple to remotely connect, activate, and manage subscriber devices and services. With CCFG, service providers can realize the following benefits:

- ▶ Increased customer satisfaction: Subscribers enjoy faster service startup and much quicker resolution for home network problems, such as Wi-Fi related issues
- ▶ Decreased operating expenses: Many home network problems including Wi-Fi related issues can be resolved without a truck roll or equipment swap-out
- ▶ New potential revenue streams: A variety of opportunities are enabled by a new level of access and visibility into your subscribers' home networks

CCFG is a Software-as-a-Service (SaaS) application that features Service Support and NetOps modules to facilitate easy configuration and troubleshooting of GigaCenters, while providing an intuitive interface to apply bulk operations on GigaCenters. CCFG also includes such features as device auto-discovery and plug-n-play service management. Integrated with our cloud-based Compass service delivery ecosystem, CCFG also enables service providers with the intelligence and tools to simplify, manage, and monetize their subscribers' broadband experience.





Benefits for service providers and subscribers

Extended service reach = Potential new revenue streams

By extending a service provider’s reach into home networks, CCFG enables an array of potential new sources of revenue, such as home network management services that include Wi-Fi management, remote home network diagnostics including Wi-Fi analyzer, and managed content filtering.

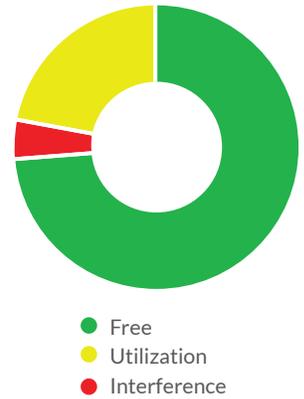
Instant gratification = Increased customer satisfaction

Deliver immediate broadband gratification for today’s demanding broadband consumers... and keep them satisfied by fixing many of their home network problems including Wi-Fi related issues quickly.

Virtual IT technician = Reduced OPEX

Remote device management and diagnostics (virtual IT technician) that includes Wi-Fi analyzer can often eliminate the need for a truck roll. Many problems that used to take hours to resolve can now be fixed in minutes.

Channel Utilization



Troubleshooting > Wireless

2.4 GHz Radio | 5.0 GHz Radio

Observations and Recommendations

Weak Signal Strength with Reduced Capacity Analyze

- Move the client device to obtain better signal strength
- Move Gigacenter station if moving the client device doesn't help (requires technician)

Transforming your business

Getting into the consumer IT services market has never been easier. Through simplified service activation, cloud-based subscriber network diagnostics, Wi-Fi analyzer, and a fully integrated network, service management environment, network operators are fully equipped to act as virtual IT technicians and to establish a firm foothold in the growing consumer IT services market.

Calix now enables you to extend your service reach beyond the access network and into the home network. CCFG elegantly integrates element and premises management with tools that analyze and monetize the complete broadband experience.

- ✦ Wi-Fi analyzer with observations and recommendations to troubleshoot and resolve issues
- ✦ Automated activation and no-hands maintenance
- ✦ Cloud-based device and service management of GigaCenterst
- ✦ Fully integrated broadband access, home network, and Wi-Fi management