EXECUTIVE SUMMARY

Matrix Design Group is a full service fiber engineering and telecommunications design firm, who along with our sister company, Millennium Communications Group, can take almost any fiber project from concept to completion.

We have worked for large companies and organizations such Rutgers University, Level 3 and AT&T. We have also great experience with small New England communities such as the towns of EC Fiber in Vermont and the Towns of Leverett (FTTH build and final design) and Alford (FTTH design) in Western Massachusetts. We have been working with the Town of Hardwick Broadband Committee and Town Administrator to come up with the best case solution for getting high speed broadband to the unserved homes in Hardwick.

The Matrix Design Group plan will bring GPON FTTH to approximately 164 of the 258 unserved homes in Hardwick (the count of unserved homes is via mapping information provided by the Hardwick Broadband Committee). Coupled with Comcast's existing commitment to build-out to 94 unserved homes in the southwest corner of town (southern Greenwich Road) once the two builds are completed - the percentage of homes in Hardwick served by high speed broadband should approach over 97% (based upon 1,500 homes in town) – well above the goal set by the Massachusetts Broadband Institute of 96% coverage.

The Town of Hardwick presents many issues that need to be overcome in order to bring high speed broadband to the unserved residents of the Town. Among the hurdles to a fiber build in Hardwick include the following:

- Based upon the map information provided to Matrix Design Group the GPON FTTH build would need to cover 27.8 miles of road to reach 164 unserved homes. That's a density of just 5.9 unserved homes per mile which is not a density which would support any proper business plan without significant subsidy.
- The 27.8 miles of build include 5.2 miles of road where there are poles but either no homes or homes already served.
- The 27.8 miles of build also include 3.4 miles of road where there are neither poles nor homes to serve but are necessary in order to link the unserved parts of town.

In order to build our proposed GPON FTTH network in the Town of Hardwick, Matrix Design Group would require the following from the Massachusetts Broadband Institute (MBI):

- MBI would need to fund all make-ready and all aspects of make-ready in the town.
- MBI would need to fund new pole placement in town to connect the unserved areas.
- MBI would need provide Matrix Design Group with a grant to install fiber along the 5.2 miles of existing pole line where there are no unserved homes and along the 3.4 miles of new pole line where there are no homes.

- MBI would need to provide Matrix Design Group with a grant of $500 for each of 164 unserved homes to help subsidize the network build

Four items worthy of mention regarding the Matrix Design Group plan for the Town of Hardwick:

- All 164 unserved homes would be served from the existing Massbroadband123 CAI at the Hardwick Fire Station on Hardwick Road (Route 32A).
- The investment in FTTH may be more expensive upfront but it would be superior in service and in every other aspect over any potential wireless or hybrid solution.
- Two of Hardwick's neighboring towns are among the 45 towns MBI has identified as being completely unserved (Petersham and New Braintree). The potential exists for these three towns to somehow work together in a regional network arrangement.
- Comcast has already committed to build out the Southwest corner of town and therefore should not be in need of any incentive funding

Matrix Design Group proposes to design and build out a GPON FTTH system passing 164 unserved homes in Hardwick. Once the network is built Matrix Design Group will maintain and operate the network for a period of twenty (20) years.

Matrix Design Group plans to offer the following services:

- High Speed Internet Service (up to 50 Mbps symmetrical) for $95 / month
- High Speed Internet Service and a VoIP line for $115 / month
- An additional VoIP line may be added for an $20 / month
- An indoor ONT with built-in 802.11 AC WiFi will be optional for a charge of $5 / month

The Town of Hardwick (or Hardwick MLP) will have the option to purchase the network for $763,990 at any time during the first three years of operation. After three years the purchase price will decrease by $44,940 per year. After the second year of operation $3,500 will be added to the purchase price for each new subscriber added to the network. After five years of operation, the purchase price will no longer include either the subscriber ONT's or the head end OLT electronics. After 20-years the Town or the MLP will have the option to purchase the network for $10.

The option to purchase the network will allow the Town of Hardwick to change service providers if they are unhappy with the level of service provided by Matrix Design Group. The option to purchase will also give the Town the ability to join a regional network if they so desire.

PROPOSED FIBER BUILD FINANCIAL AND LOGISTIC REQUIREMENTS

The Matrix Design Group plan to provide high speed bandwidth to the 164 unserved residents of Hardwick would entail the following:

- Utility pole application fees (Verizon and National Grid) **$20,500** (to be paid by MBI)
- Engineering fee to submit and shepherd utility pole applications **$19,200** (fee to be paid by MBI – work to be done by Matrix Design Group)
- Make-ready costs for 749 poles at an estimated $600 per pole **$449,400** (to be paid by MBI)
- Installation of 101 new poles to be owned by the town **$151,500** (to be paid by MBI – work to be done by Matrix Design Group)
- MBI to provide Matrix Design Group with a grant of **$146,200** to install fiber along the 5.2 miles of road where there is an existing pole line but no unserved homes and along the 3.4 miles of road where a new pole line is to be installed but there are no homes.
- MBI to provide Matrix Design Group with a grant of **$82,000** to help subsidize the FTTH network build..
- Town to be responsible for police details during both make-ready and fiber installation.
- Home owner to pay $500 for drop to house during pre-subscription period. If installation requested after pre-subscription period cost to install house drop will be $1,500.
- Home drop to be up to 300 feet aerial from curb or via usable conduit. If no usable conduit available for underground drop – homeowner to be responsible for installation of conduit.
- Home owner to be responsible for indoor cabling. If indoor ONT with built-in WiFi desired then there will be an additional $5 monthly equipment fee..
- Town to have option to purchase network for $763,990 during first three years of operation. After year three the purchase price will decrease by $44,940 per year. After year-two $3,500 will be added to the purchase price for each new subscriber added to the network. After five years of operation, the purchase price will no longer include either the subscriber ONT's or the head end OLT electronics.
- After 20-years the town has the option to purchase the network for $10.

Total MBI Financial Contribution for Hardwick FTTH Build: $868,80000

The 27.8 mile GPON FTTH build would wholly or partially include the following streets in Hardwick:

- Hardwick Road
- Breen Road
- Mellon Road
- Thresher Road
- Jackson Road
- North Road
- Delargy Road
- Taylor Hill
- Chagnon
- Route 32
- Goddard Road
- Upper Church
- Barre Road
- Ridge Road
- Ruggles
- Czesky
- Lucas
- Greenwich
- Lyman
- Muddy Brook