

# Status Report to the Board of Selectmen Town of Harvard Broadband Committee

11/7/2017

The Broadband Committee is sensitive to the extraordinary financial circumstances that the Town faces, and it is looking to find viable methods to fulfill its charter without further impacting Town finances. The Committee concentrated on the following topics since its last report.

- Getting price estimates for the fiber-optic infrastructure
- Preparing high-level design requirements for the FTTH network
- Leasing options for dark fiber
- Research implementation of the municipal broadband in Concord MLP
- Internet usage of the Harvard Schools and Municipal buildings

The Committee's next steps will be as follows:

- Researching approaches of independent funding of the project
- Developing a recommended governance model for the MLP

In order to get better idea about the cost of the fiber-optic infrastructure which is necessary to deliver the FTTH service, the committee solicited prices estimates from various vendors by preparing high-level design requirements. We have asked four vendors and two of them responded. Their presentations are given in Appendix A.

The committee prepared high-level design requirements for the FTTH network that would satisfy the requirements of connecting every parcel in the Town. We have chosen the industry standard GPON architecture to deliver the optical signals. In GPON architecture, a fiber strand is shared between a few dozen subscribers reducing the number of fiber strands necessary to distribute. Proper encoding is used to separate and secure each subscriber's network traffic.

Another area that the Committee pursued is leasing options for the existing dark-fiber infrastructure. As it was stated in the previous report, the Town of Harvard already has a fiber-optic backbone covering a limited area, which can be leased from a third-party. Utilization of this existing dark-fiber can bootstrap the FTTH project in the short term since it reduces the initial capital investment. Therefore, the committee solicited a quotation for the lease of dark-fiber, which is provided in Appendix B. It should be stated that leasing may not be cost effective in the long run.

We also investigated the implementation of the municipal broadband in Concord Municipal Light Plant (MLP). The Town of Concord is providing municipal broadband services via its established MLP. It is important to note that Concord's experience does not directly apply in our case since Harvard neither has a revenue generating MLP nor owns the utility poles. Nevertheless, learning certain technical, operational and financial details from Concord was very helpful.

We investigated the internet expenses in the Town schools and municipal buildings. The aim was to consider consolidation of all the internet services of the Town schools and municipal buildings under the municipal broadband service, which would provide a revenue source. A spreadsheet providing Town's internet expenses is given in Append C.

We investigated approaches for successful funding of the project. In that regard, we contacted a broker-dealer specializing in civic micro-bonds. In this approach, the bond for a given municipal project is sold directly to the public, not just large institutional or experienced investors. Since the denomination of the micro-bonds are lower than the traditional municipal bonds, more people can buy the bonds directly. In addition, the company can also help in marketing of the project hence increasing the probability of project success. A presentation explaining the approach is given in Appendix D.