

To: Board of Selectmen, Town of Milton
From: Municipal Broadband Committee
Subject: Request for Funding of Design Study
Date: June 25, 2018

Executive Summary

The Municipal Broadband Committee is charged with examining the feasibility for the Town of Milton developing and operating its own broadband network. The committee has evaluated several strategic options via online research and meetings with leaders of the other towns' broadband organizations and meetings with several consulting organizations.

Our work has led us to these conclusions:

- After meeting with several local municipal broadband operations (e.g. Concord, Leverett, Braintree, Norwood) as well as several consulting organizations, the committee recommends that the Board of Selectmen develop an RFP for a “Mile-High” study that will examine and validate the recommendations of the committee.
 - Crucially, we believe such a study will be instrumental during the town’s current negotiations with Comcast, for reasons elaborated in the next bullet point.
- There is a pressing need to consider the current status and future requirements for the town’s Institutional Network (INET). Comcast is supporting the INET under the current contract that is expiring in October. There are serious questions about the condition of the current technology and the costs to replace and enhance the current INET. Because the INET is a key element of the Comcast negotiation and because the committee believes that there is a significant opportunity to substantially improve the INET, both in the short and long terms, we recommend that the town’s near term efforts be focused on this topic.
- With regard to a town-wide residential broadband network (a.k.a. “fiber-to-the-home”, or FTTH, denoting the use of fiber optic technology to carry these services):
 - given the urgent need to immediately address the town’s INET;
 - given that the market for residential video programming, high-speed Internet and other broadband services is rapidly evolving, necessitating a careful and prudent planning process;
 - and given the high-cost of building such a network;

the committee strongly recommends that any decisions on town-wide, FTTH, municipal broadband network should be deferred until after the immediate needs of the town's INET are met.

Methodology

To fulfill our charge, the Municipal Broadband Committee's primary approach entailed 1) examining the status of municipal broadband networks both locally and nationally, and 2) examining the role of Milton's INET in serving government offices and schools.

We've held 10 public meetings between 3/5/2018 and 6/18/2018. Our deliberations included research as well as inviting expert guests to address the committee (11 experts in total): some who have built municipal broadband networks, and others who currently operate municipal broadband networks in Massachusetts. In addition to these guests the committee chair also interviewed another 23 experts.

Please see Appendices 1 & 2 for a complete list of meetings and experts the committee has met with.

Summary of Findings

- Within the purview of the committee's charge to explore the possibility of building a municipal broadband network, we have found that these networks typically fall into two broad categories:
 - Institutional networks that are used for municipal data and broadband operations, and may include other non-municipal entities (much like Milton's current INET);
 - Residential networks providing TV/telephone/Internet services to residents.
 - Some clarification: going back to the 1970's, cable companies like Comcast built cable TV networks in communities under the auspices of franchise agreements. At first these networks only delivered video programming, in time began offering telephone services, and by the late 1990's began offering Internet services too (hence the so-called "triple play" offerings you see from cable companies). From the early 2000's until today it's common to use the term "broadband network" to describe cable companies' cable TV networks, since they offer access to the Internet as well as video programming like ESPN and HBO.

- The lion's share of broadband networks, both nationally and in Milton, employ cable TV companies' dated coaxial cable technology, which is widely recognized as not being capable of handling the exponential rise in data expected to be generated and consumed in the coming years.
- In Milton, one commercial provider of broadband network services (Comcast) offers high-speed Internet services for the entire town. A second provider (RCN) offers similar services to selected neighborhoods. Verizon does not currently offer its broadband FiOS service in the Town, and has given no indication that it plans to do so. Therefore, Comcast enjoys a near monopoly in residential broadband services as well as being the sole provider for the town's INET.
- The commercial providers' existing broadband network outside plant (i.e. wires) uses both underground and aerial conduit, the latter distributed on utility poles owned by either Eversource or Verizon.
- Attaching new equipment and cables to the poles requires a negotiated license with the pole owner.
 - Quick note, elaborated below: the Town currently has a fire alarm system carried on Eversource's and Verizon's poles, and may have legal rights for the use of that space on these poles.
- Separate from these commercial services, Comcast also currently operates a dedicated network (the INET) that connects key sites for the town: town hall, the public schools, police and fire stations.
 - Comcast also owns the town's INET, thereby limiting the town's flexibility to enhance and expand services and capabilities.
- While these two network categories (institutional and residential) often use similar technologies, they employ very different economic models and present differing operational issues.
- Broadly speaking, it is easier to successfully develop and operate an institutional network and much harder and more costly build, market, and manage a residential network.
- The next Comcast contract is very likely to exclude the support and maintenance of our INET. Untimely disconnection or diminished technical support of INET services could cause major disruptions to the town's data and high speed Internet infrastructure.
 - Because of this it is likely that the town will have to replace all of its current network/Internet services for town offices and the schools.

- The town would have to decide between building its own INET or contracting for these services from a commercial provider resulting in a new recurring expenses that is not currently anticipated in the town's budget.

Recommendation

- The data gathered to date suggests that Milton should focus on developing an institutional network, while allowing for the potential for that network to be usable as the backbone for possible future residential networks.
- **Accordingly, we are proposing that the Board of Selectmen issue an RFP for a professional study of a municipal broadband network for the Town to further explore and validate the committee's initial assumptions.**
 - Such a study (colloquially referred to as a "mile high" study) would establish the feasibility and likely cost for building a municipal broadband network.
 - In light of the urgency presented by Comcast's likely abandonment of INET support in the next franchise agreement, we also urge that the RFP be developed and issued as soon as possible.
- We believe that the "mile high" study we envision should cost no more than \$30,000.
- The study's cost will be a function of how much work we ask the consulting firm to do, so the final number may be less than the committee's estimate.

Summary of Issues for Study

There are several well-established consulting firms that focus on municipal broadband projects. We seek a high-level study of options and best practices for providing appropriate network solutions for Milton.

The study we envision would, at the least, provide a high-level network design, a construction timeline, and estimates of costs for both construction and operation. Such costs would include but not be limited to construction labor, network components (e.g. cabling, electronics), utility pole "make ready" tasks, and estimates for ongoing network operation and maintenance.

Our committee discussions have identified certain elements that are specific to our situation and should be explicitly called out in the RFP and ensuing study:

1. As an alternative to purchasing commercial network services from Comcast into the indefinite future to support town operations on the INET, Milton should instead build a replacement for INET that it would own and operate. Similar projects in other towns have had short payback periods (typically 4 years or less).
2. The network design should be targeted at INET replacement, as opposed to building a residential broadband network. Its costs and construction timeline should be driven primarily by the need to accommodate the Town's current data and communication needs when Comcast's support of the INET is discontinued.
3. However, the new network design should not duplicate the INET's current topology, nor its relatively limited capacity. For example, the current INET design is a star-schema, an out-dated design. Current industry best practices suggest employing a redundant ring design to connecting the various town sites.
4. Design possibilities should take into account the town's rights on Eversource's and Verizon's utility poles. For example, we might be able to take advantage of the town's existing fire alarm system, in that it may be possible that a municipal broadband network could reuse the space currently used on poles for the fire alarm system.
 - a. If this is do-able, then Milton would then be able to use the new broadband network to run the new fire alarm system.
5. We have nearby towns (Braintree and Norwood) that currently operate municipal broadband networks and are keen to be considered as potential partners or operators for a broadband network in Milton.
 - a. The model of collaboration and/or partnership with neighboring municipalities is already a viable one in Massachusetts (e.g. Leverett and Holyoke), and offers unique advantages to a town like Milton not otherwise available were we to not pursue this option.
6. The functional and technological capabilities of the envisioned network should support the possibility for other uses on the horizon, both for municipal opportunities (e.g. first responder communications, educational services for the public schools, healthcare services for local elderly communities, leasing to third-party operators), as well as possible expansion to support a town-wide residential broadband network.
7. The study should consider potential public private partnerships with the caveat that the town of Milton retain ownership and control over any resulting broadband network.

Appendix 1 – List of Committee Meetings and Guest Speakers

The Committee has met ten times between March 5, 2018 and June 18, 2018.

Meeting Date	Guest Speaker	Organization	Title/Expertise
3/5/2018	(no guest)		
3/12/2018	Lori Sherwood	VantagePoint Solutions	Director of Broadband Development. Lori also served for many years in the public sector in Maryland, as Broadband Program Director for the nationally recognized One Maryland -Inter County Broadband Network
3/19/2018	Peter D'Errico	Leverett, MA	Chair of Leverett's Board of Selectmen. Both Peter and Tom were instrumental in creating Leverett's municipal broadband network, creating the first new municipal light plant in Massachusetts in the past 75 years, and partnering with the city of Holyoke for administration and operation
	Tom Powers	Leverett, MA	

Meeting Date	Guest Speaker	Organization	Title/Expertise
3/26/2018	Bill Underhill	Concord, MA	Telecommunications Coordinator for the town of Concord. Bill also has extensive industry experience prior to his current job in Concord, primarily in Austin TX.
4/9/2018	(no guest)		
4/23/2018	Bill Bottiggi	Braintree, MA	General Manager, BELD
	Jack Orpen	Braintree, MA	Broadband Manager, BELD
	Darryl Hanson	Norwood, MA	Broadband Division Manage, Norwood MLP
	Jim Collins	Norwood, MA	Superintendent, Norwood MLP
4/30/2018	(no guest)		
5/14/2018	Joanne Hovis	CTC Technology and Energy; Coalition for Local Internet Choice	CTC President. Joanne has over 25 years of experience advising public sector clients regarding how to build strategy and opportunity for public-private partnerships in broadband.
	Dave Talbot	CTC Technology and Energy	CTC Senior Advisor. Dave is also an elected member of the Broadband Commission for the town of Reading, MA. He was also a senior fellow at Harvard University's

Meeting Date	Guest Speaker	Organization	Title/Expertise
			Berkman Klein Center for Internet and Society.
5/23/2018	Bill Solomon	Attorney hired by Board of Selectmen for renegotiation of Comcast franchise agreement.	
6/18/2018	(no guest)		

Appendix 2 – List of Other Experts Consulted

In addition to meeting guests the committee chair also interviewed several other people, both industry experts as well as other interested parties (e.g. Milton schools, other town broadband committees).

Date	Expert	Organization	Title/Expertise
8/22/2017	Doug Adams	The Think Agency	Conducts market studies for broadband feasibility
8/24/2017	Brian Lippold	Sewall Engineering Services, Old Town, ME	Director of Broadband and Telecommunications Consulting
11/7/2017	Ben Compaine	Cambridge, MA	Cambridge Broadband Task Force
11/10/2017	Jay Leslie	Cambridge, MA	Cambridge Broadband Task Force
11/22/2017	Saul Tannenbaum	Cambridge, MA	Cambridge Broadband Task Force
1/3/2018	Greg Whelan	Greywale Advisors	Communication Infrastructure and Open Access Broadband Advisory Company
1/3/2018	Steven Johnston	OpenCape	CEO.

Date	Expert	Organization	Title/Expertise
			OpenCape Corporation is a 501c3 nonprofit technology company that owns and operates a state-of-the-art fiber optic network built to serve local governments, businesses, and residents of Southeastern Massachusetts, the Cape & Islands
1/5/2018	John Campbell	OpenCape	Chairman, Board of Directors
2/22/2018	Lindsey Brannon	Neighborly	Innovative municipal bond broker
2/27/2018	Chase Berkley	Milton DPW	
	Jack Calabro	Milton DPW	
3/13/2018	Drew Clark	Broadband Breakfast	BroadbandBreakfast.com is a Washington-based news organization building a community of interest around Infrastructure, Smart Cities, Broadband's Impact and Rural Telecom
3/15/2018	Robert Wack	Westminster, MD	City Council President. Oversaw successful development and roll-out of city's broadband network.
3/19/2018	Jason Whittet	100 Resilient Cities	Former Deputy Director of the Massachusetts Broadband Initiative (2009-2013)
3/19/2018	Jack Ferriter	Ferriter Law Firm,	Advises on business and

Date	Expert	Organization	Title/Expertise
		Holyoke, MA	municipal law; advised the town of Leverett MA with creation of their successful broadband network
3/20/2018	Craig Settles	Independent consultant, Oakland, CA	Strategic consulting helping communities' broadband networks improve economic development, healthcare delivery, education and local government operations
4/4/2018	Jory Wolf	Magellan Advisors	Before joining Magellan, Jory worked for 22 years for the city of Santa Monica, CA as Chief Information Officer, and was the initiator and architect of that city's pioneering work building a municipal broadband network.
	Joe Corrilla	Magellan Advisors	
	Ashley Poling	Magellan Advisors	
	Melanie Downing	Magellan Advisors	
4/6/2018	Jim Baller	Baller Stokes & Lide; President of Coalition for Local Internet Choice	Jim's firm specializes in communications law, including broadband, telecommunications, cable, poles, ducts, conduits, towers, rights of way
4/23/2018	Glen Pavilcek	Milton schools	
	Bob Pattison	Milton schools	

Appendix 3 – Sample of Prepared Questions for Guest Speakers

When the committee invited guest speakers we prepared a list of questions and submitted them to the guest(s) prior to the meeting. Sometimes these questions were addressed one at a time, but more often than not they were used as jumping-off points for wider discussions.

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Town of Milton Broadband Committee

Questions for Guest Speakers Darryl Hanson and Bill Bottiggi
April 23, 2018

Broadband Committee –Broad Strokes

In your opinion what should the purview be of a broadband committee? E.g. where does the work of the committee end and the work of consultants / experts begin?

- What areas should we first focus on?

If the committee were to recommend to the Board of Selectmen that we continue our assessment of creating a municipal broadband network, what would your recommendation (or opinion) be for next steps? For example, would it be to hire a project manager, or commission a market study, or engage with a consulting firm for a feasibility study?

- Or something else altogether?

The need for a network configuration plan seems like a necessary step to estimate the cost of building a network, however we've heard diametrically opposed opinions about commissioning such a study this early in the process.

- What in your opinion is a valid way of ballparking the cost of network absent a network design plan?
- Or would you say it's necessary to commission a high-level network design (as opposed to blue-print detail) in order to estimate Milton's capital cost to build a municipal network?

Governance / Business Model

Can you describe in broad strokes how your town's MLP/Broadband department is organized?

Has your town considered (or already started) offering services to adjoining towns (e.g. network plan and design, or network operator)?

- What might this arrangement look like? E.g. network maintenance and upgrades, tree trimming?
- What might Milton expect for typical contract terms and costs?

What would you see as the pros/cons of Milton connecting to the Internet through your town?

If Braintree or Norwood partnered with Milton, would it be beneficial/desirable/feasible to then contract with the City of Boston to build a direct link to the Boston Internet Exchange at Summer Street?

Milton does not have a large commercial base, but we do have 3 significant non-municipal anchor institutions: Milton Hospital, Milton Academy, and Curry College (plus a number of smaller institutions).

- In your opinion, how might these institutions benefit from hooking up into a municipal broadband network versus a commercial one?
- How might Milton benefit from such an arrangement?

Do you know of any similarly sized Towns to Milton that have organized a Municipal Broadband arrangement (with or w/o a Municipal Light Plant as part of the process)? Do you know any that have failed and why they did?

Benefits to town government

This question focuses on how your town uses its town government network (in Milton called the Institutional Network, or INET).

Throughout the municipal broadband literature you often read about benefits to town government. Can you give us specific examples of municipal functions delivered via your town's broadband network? E.g.:

- Telephone systems?
- Town IT infrastructure (e.g. schools, town departments)?
- Access to wholesale internet?
- First responder communications?
- Traffic monitoring?
- Security camera systems

- Overall telecom savings?
- Others?

(We're interested in learning about all the ways your town uses its network, particularly how your schools and public safety departments benefit).

And finally, if Milton were to build a fiber optic INET, what sorts of benefits would you anticipate? Both short and long term, and/or financial, engineering, network flexibility.

Incumbents

Do other broadband providers operate in your town?

- How does their pricing compare to the town's network?
- How about bandwidth & speed?

Please share any thoughts you might have on the pushback Milton should expect from incumbents (Comcast, Verizon, RCN), and how we as a community might meet such pushback.

How did you navigate political & commercial opposition from incumbent providers like Comcast?

How do you position yourselves competitively vs. those commercial providers? Is that positioning the same as what you started with?

Muni Broadband - Benefits for Public Access TV

How are your towns' public access TV networks funded?

How are your public access operations integrated into the municipal and commercial cable networks?

Do your public access operations have channels on your incumbent systems? Or just on the municipal cable system?

Engineering / Outside Plant

Is your town's broadband network fiber? HFC (hybrid fiber coax)? Coax?

Does your town currently have fiber to the premises (FTTP)?

- If not do you have any plans to extend fiber to the premises?
- How do/would you finance the per-house (last-mile) connection expense of your network?

Does your town offer/maintain any public wifi?

Please share with us your insights/opinions regarding the Milton's requirements for pole attachments.

- Is the process the same with an Electric Company (if they owned the Pole) and or the Telephone Company?

Financing

Are you aware of any federal or state grant money available for a town like Milton (i.e. not rural, and not "underserved" according to the FCC definition).

Network Expenses

What are the main expenses of a municipal broadband system?

- Capital expenses like wires,
- Employees, maintenance, billing, customer service, etc.
- Operations & Maintenance – repair and upkeep
- Cost for the system to connect to internet service
- Pole access fees