



SHARON, CONNECTICUT
FIBER TO THE PREMISE NETWORK
FEASIBILITY STUDY
FINAL REPORT

Presented by

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1. Executive Summary

We are pleased to provide this final report on the feasibility of implementing a broadband network for the Town of Sharon. We have developed a high level design that will provide service to all residents. There are 99.1 miles of construction on public roads and an additional 17.86 miles on private roads. Of the total 116.96 miles 89.2% is aerial construction, with the balance of 10.8% requiring new underground construction. Estimates are also provided for drop construction costs are for all parcels.

The high-level network design contains eight (8) Fiber Service Areas (FSA), each with a 288 fiber distribution hub and standard 1x32 optical splitters. The network is all passive optical from the headend to the subscriber, with no power required except at the ends. Transport shall be delivered over fiber strands connecting the new headend proposed behind the school on Hilltop Road to the Connecticut Educational Network and on to Boston and New York City.

We have specified a new 12' x 20' prefabricated building for the headend facility. The building will act as the headend for the network distribution, provide connection to the transport circuits, and establish colocation facilities for additional Internet Service Providers. The building shall also include a 50KW emergency diesel generator to provide continuous operations during power outages. All critical equipment within the headend shall be powered by a -48VDC power plant with a 15 minute battery backup that will ensure an uninterrupted switchover to emergency power.

We understand that the Town may want to consider providing a full open access network where residents can choose among competing ISPs. Given that there is competition from incumbents, we are recommending to build out the network and offer service with a single core Internet Service Provider. We feel this will allow the Town more control over the service pricing, its quality, and most importantly customer service.

The crucial time during pre-construction is an opportunity for the Town to establish itself as the best value service through effective brand marketing and excellent communication. Once the network is established, additional ISPs can be recruited through a competitive process when and if necessary.



We have identified Crocker Communications based in Greenfield, Massachusetts as a potential core ISP partner for your project. They serve communities in Western Massachusetts with high speed broadband and telephone services, with colocation facilities in Boston, NYC, and Springfield, Massachusetts.

We have enjoyed working on this study with the broadband committee. If you decide to move forward with this project our team is prepared to discuss next steps and offer additional engineering, construction, and operational services.

Respectfully,

A handwritten signature in black ink that reads "M A Solitro".

Michael A. Solitro
President

Sertex Broadband Solutions

2. Project Understanding and Approach

a. Service Capacity / Speed

The network is configured in a star topology to deliver GPON shared Symmetrical 1 GBPS to all residents and business in each community. In addition, a percentage of the feeder fibers from the headend serving each distribution hub are reserved for higher speed dedicated services such point-to-point as Active Ethernet service.

To help protect the Town's investment in electronics and meet the demand for higher bandwidth needs in the future we specified the Adtran Combo PON Optical Line Terminal Card for this project. With a simple change of the lower cost plugin optics, each of the eight ports can be upgraded to run next generation, XGS 10G PON, either stand alone or simultaneously on the same fiber with standard GPON. This feature provides the town with 4 times GPON bandwidth capacity without adding additional fiber cable plant.

b. Fiber Connectivity

All subscribers are fed with a direct fiber connection to their premise from the distribution hub located in their designated service area. The hub is connected to the headend by a lesser amount of "feeder" fibers that will be connected to the active optical equipment within the building. Passive Optical Splitters within the hub are used to connect subscribers to the shared 1G GPON service. Splitters can be bypassed to provide higher bandwidth dedicated services to high use customers. The proposed network is all fiber and does not include any microwave, radio frequency, or any other over the air technologies.

c. Extent of Fiber Backbone

Every property within the Town shall have a dedicated port on a Corning Multiport Terminal located on the Right of Way outside of their property. When subscription is taken, a drop cable is plugged into the terminal port and run to the outside of the premise and terminated in a Fiber Transition Housing (FTH). An Installation Technician takes the connection from that point into the premise to connect the subscriber to the service.

d. Network Ownership

The Town shall fully own the network. The Town shall contract with vendors to provide all design, construction, maintenance, and ongoing operations.

e. Public Relations and Communications

The selected vendor(s) shall provide comprehensive progress reports during all phases of the project, including operations and maintenance. A fully staffed public relations and media team shall create a custom website for the Town that will be the focal point of the project. It shall be designed to engage your community and ensure that the residents and Town leaders are fully updated on construction progress and other critical activities. The website shall continue into network operations to provide subscription information, signup and other operational services.

A custom public relations and outreach program shall be developed that will represent the interest and objectives of the Town and effectively communicate with residents throughout the network construction process and into network operations. A professional marketing and communications team shall develop and deliver all resources for public relations, graphic design, media planning, digital marketing, and website development.

Included in the program should be the development of a custom website for the Town that will serve as the customer portal for the Town-Wide Broadband project. Residents will get facts and updates about the project, download information about fiber drops, and find answers to frequently asked questions.

Community outreach communications shall encourage residents to visit the website and learn more about the project. Construction updates shall be published regularly to keep residents apprised about the latest activities, project status, and progress. Information about subscribing for broadband Internet and phone service, streaming resources, and other information shall be added to the website as the network goes live.

PR/Communications Highlights:

- Custom website development, content, maintenance
- Social media oversight, content, and response
- Media relations (including contact list development, press releases, feature articles, editorial page/op-ed response, sharing photos with the media through email and social media)
- Developing relationships with local officials, broadband advocates, and influencers (i.e., Chamber of Commerce, Convention and Visitor's Bureau, Association of Realtors, etc.)
- Outreach and promotion (including email, text, direct mail, and advertising)
- Events publicity to celebrate milestone achievements (materials arrive, construction groundbreaking, first house lit, 1,000th customer, etc.)

- Crisis communications planning
- Weekly construction planning meetings to develop and share regular and timely construction updates.

The website shall be fully integrated with a CRM and work order system. The work order system shall provide real-time access to all work orders in process and completed, customer information, and all performance criteria for completed installations, including speed test data, PON level reading, terminal and equipment IDs, drawings and pictures of completed customer installations with customer approval signatures, ONT Serial Number, ONU MAC Number, FSAN numbers and VOIP information. The information shall be easily accessible to ensure that authorized users will be able to efficiently operate and maintain the network.

f. Customer Pricing Transparency

All subscription plans, fees and services shall be clearly outlined and made available on the Town broadband website.

g. Net Neutrality

This is a Town owned network. You shall have full control and responsibility over the compliance with State and Federal statutes for Broadband Internet Access Service Privacy, Net Neutrality, and any other regulatory requirements.

3. Operation Expectations & Requirements

a. Network Design, Construction, and Implementation

All installation personnel should be properly trained and certified for their work and OSHA safety standards. Although not a requirement, the Town should request solutions that provide factory direct extended warranties such as the Corning 25 year Certified installer program.

Benefits of using an NPI Certified installer program:

The *Corning Network Preferred Installer program* adds value to customers by assuring that technicians are knowledgeable and among the most qualified in the industry. Unlike traditional installer programs, the LANscape® Network of Preferred Installers (NPI) enables installers to tap into an extended ecosystem of beneficial connections. The ground-breaking network-style program offers a complete tip-to-tip solution by offering Corning's innovative product lines, leveraging valuable relationships throughout the fiber optic industry, and presenting a **25-year LANscape Solutions extended warranty** to municipal customers.

Outside Plant Engineering and Design

We utilized parcel and address data provided by our GIS database service to produce a high-level design for a Distributed Hub GPON fiber network with a 25% overbuild. The network is a total of 116.96 route miles. On public right of way there are 96.3 miles of aerial plant and 2.8 miles of new underground construction. Private road construction consisted of 8.04 miles of aerial plant and 9.82 miles of new underground construction. Other features of the high-level design are: 288 fibers from the headend feeding 8 - 288F hubs, and 791 terminals.

Subsequent to this high-level design, the final design will determine the final network construction elements. Underground cable plant would be designed in newly constructed conduit. However, during the final design process any options for utilizing existing third-party underground conduits to mitigate the cost of new underground construction should be explored.

Our solution addresses the fact that optical transmission equipment deployed in metro and access networks today is on the development path of using wavelength technologies, such as DWDM, to increase bandwidth and deliver more service on a single strand of fiber. Although this type of technology has been available in long haul networks for a long time, it has been cost prohibitive for last mile solutions. Equipment manufacturers are now focusing their product development efforts on bringing cost effective multi wavelength transmission solutions to last mile metro networks. Our network design shall use Corning SMF28e+, a G.652.D compliant singlemode fiber. This type of optical fiber offers the best performance today across a range of wavelengths that can be leveraged by the Town to deliver additional and enhanced serviced in the future.

Final Engineering design phase should include at a minimum the following:

- Field survey / Address verification
 - NID locations
 - Driveway locations for buried drops
 - Pole numbers birthmark information
 - Pole GPS coordinates
 - Wiring limits

- 3rd Party Licensing with pole owners

- CAD GIS Construction Work Prints
 - OSP Fiber Design
 - Head End Shelter design / site plans
 - Relay Rack design with fiber assignments at Head End
 - Poles and Spans
 - Splice Locations / splice diagrams
 - Slack Points

Items not included in this high level design scope are Special Permitting and Environmental Assessments (including related engineering and plans), Permit fees, Make Ready fees, Grant of Location process & fees, utility or Town meetings. Estimates for these items are included in our high level design pricing forms.

Headend Facilities

A 12' x 20' prefabricated building shall be constructed behind the school on Hilltop Road. This space shall be used for all headend and access electronics required to operate the network. The facility shall include a 50KW backup emergency generator set with auto switching controls. All critical equipment within the building shall be powered by a -48VDC power supply with a 15 minute battery backup to ensure uninterrupted power switching in the event of a utility power loss.

Pricing is provided in the Pricing Matrix in appendix 1. A sample drawing and specifications for the building and generator are provided in appendix 4.

OSP Construction

The Passive Fiber Optic Network shall be constructed in accordance with industry standards and best practices. We estimate that the final design will consist of eight (8) Fiber Service Areas (FSA) with a Distribution Hub and 1x32 optical splitters. There are a total 288 feeder fibers that will connect the Hubs to the new headend facility. Transport connections shall be 10G circuits from the Connecticut Educational Network (CEN), with an option to increase to 100G in the future.

Service terminals shall be Corning MOB style or equivalent with tails lengths between 100 and 1,500 feet long. MOB terminals shall be connected to distribution cabling at splice enclosures, containing between 4 to 8 terminal tails.

Aerial plant shall be aerial messenger with cable lash. It shall consist of domestic manufactured ¼" EHS Class A strand and hardware with Corning Altos Loose Tube cable lashed using 0.045" stainless steel lashing wire. 100'–150' fiber slack loops shall be installed at approximate ¼ mile increments. "Fiber Optic" tags shall be placed at all poles and transition points.

New main line underground construction is expected to occur mostly in underground residential developments (URD) and private roads. In these locations we shall direct bury SDR 13.5 HDPE / multicell microduct conduit at a depth of 18' – 24".

Handholes shall be used in sidewalk areas and be ANSI Tier 22 rated 24" x 36". Handholes shall be spaced at intervals of 500 – 1,000 feet.

Manholes shall be used in roadways or other designated areas of vehicular traffic. Manholes shall be precast concrete and 3' x 3' x 3' in size. The steel frame and cover shall be AASHTO H-20 rated. Manholes shall be spaced at intervals of 500 – 1,000 feet.

Grass restoration shall be 4" loam and seed.

Asphalt restoration shall be the full depth of existing asphalt within the trench line. Final restoration shall be in accordance with State and Town requirements.

Concrete roadway base shall be replaced for the entire depth of the existing concrete and topped with 1 ½" to 2" of asphalt surfacing.

The new telecom building to house all electronics and provide service shall be a 12' x 20' prefabricated equipment shelter manufactured by United Concrete. Installation shall include all engineering, site preparation, foundations, electrical and mechanical connections to complete the work. Diverse path fiber service shall be engineered to connect the building to the network.

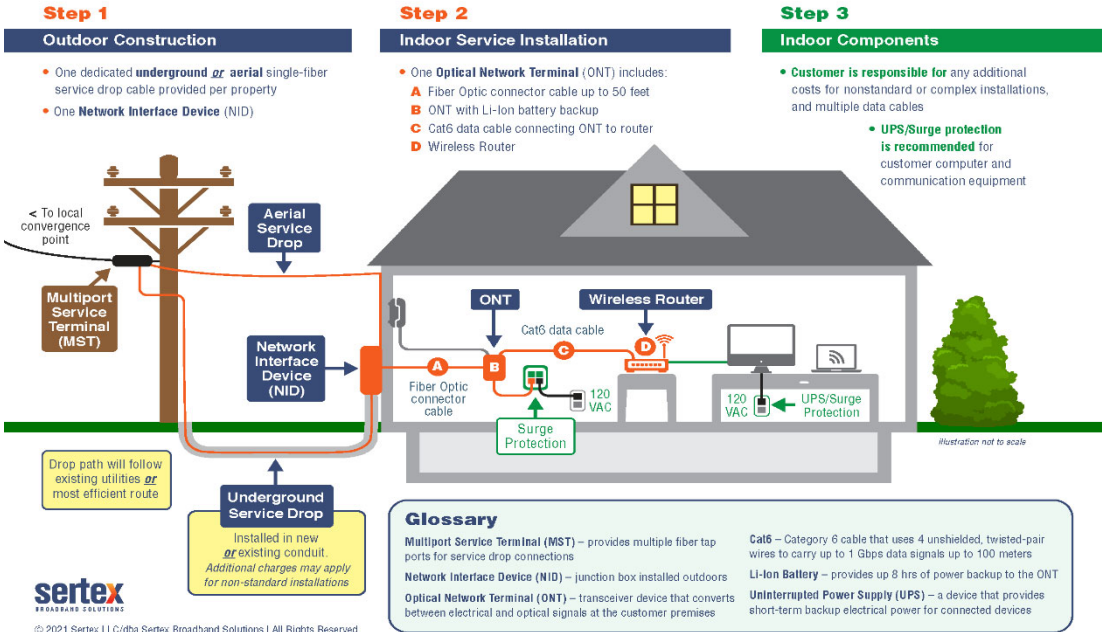
A 50KW backup diesel generator shall be installed with the building to provide emergency power in the event of a power outage. The unit shall be connected directly the building electrical service and designed to automatically switch over during power loss. The unit shall have fully functional features that can be programmed to test operability at preselected intervals.

Service Drops shall be constructed using Corning ROC OptiTap Drop assemblies. The OptiTap side of the cable shall be plugged into the terminal port and terminated at the premise end with an SC/APC connector in a Corning Fiber Transition Housing (FTH), weather resistant enclosure. Drops will follow existing methods of connection, aerial or underground. If available, and capable of use, existing underground conduit pathways may be utilized.

Multi Dwelling Units (MDU) will require individual surveys to determine connectivity and drop path requirements.

New underground drops shall be 14/10mm tonable microduct placed to a depth of 12" by the direct plow method. The drop fiber cable shall be placed in the microduct utilizing the blow in method.

Standard Broadband Drop Configuration for Single Family Home



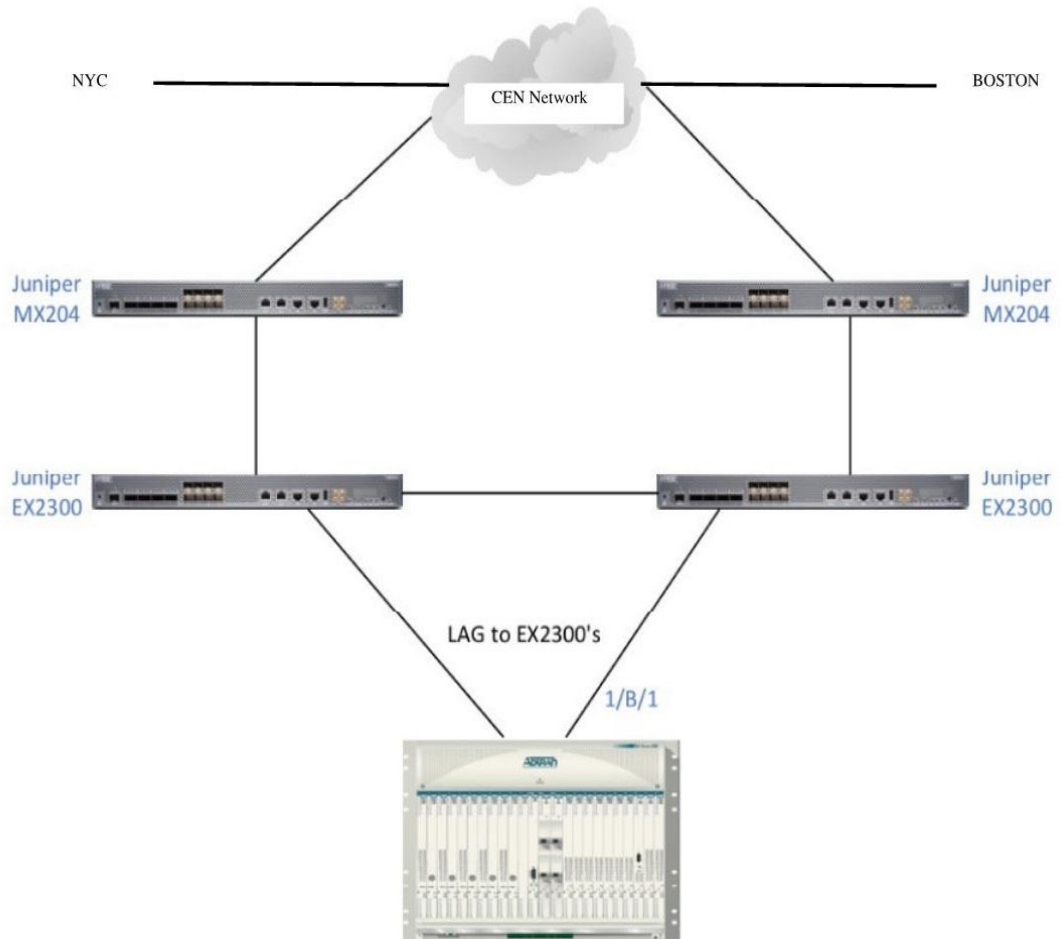
Clarifications

Pricing includes an estimate of special traffic control and police details. Contractor shall be responsible to arrange and schedule police details as required. The town should pay these costs directly.

Cost estimates for environmental and special permits are included in the OSP pricing summary.

Access and Aggregation Electronics Design

A transport fiber connection shall be established between the new Town Headend, located behind the school on Hilltop Road to the CEN network. Dual Juniper routers at the Headend will provide redundant connections on the Three Ring Binder Middle Mile Network.



We have selected the ADTRAN Total Access 5000 for inter town transport and customer service delivery.

ADTRAN Total Access 5000 Series provides an ultra-flexible, high-capacity, deep fiber solution. The Total Access 5000 Series is a carrier class Multi-service Access and Aggregation Node (MSAN) that bridges the gap between existing and the next-generation networks — like 10G PON. With a pure Ethernet core, the system supports services over copper and fiber, easily scaling to support even the most bandwidth intensive applications. The Total Access 5000 Series provides the bandwidth and Ethernet switching capabilities needed to deliver an effective service offering and meet a variety of legacy and emerging service requirements.

Total Access 5000

- 9 RU, 23-inch brackets
- System Controller Module slot
- Two redundant Switch Module slots
- Twenty-one Access Module slots



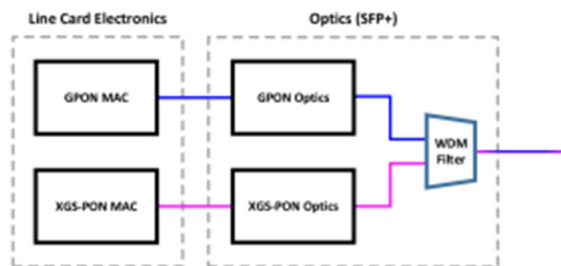
Total Access 5000 Series Access Modules Combo PON Optical Line Terminal (OLT)

The Combo PON OLT Access Module is capable of supporting both GPON and XGS-PON coexistence. The OLT provides ease and flexibility when migrating from GPON to XGS-PON deployment service rates. It helps meet the service rate requirement needs of different subscribers.

The combo optics of the OLT combine GPON transceiver, XGS-PON transceiver, and an integrated WDM filter into a single SFP+ form-factor. There is no need for additional accessories, such as an external WDM filter, that will introduce insertion loss onto the ODN.

The OLT provides eight, industry standard – G.984.X, G.9807.X, G.988.X compliant – 2.5G/1.25G or 10G/10G PON interfaces per access module. The OLT provides PON optics through front panel fiber SFP+ cages labeled PON 1-8. The 8-port Combo PON OLT supports rates up to 40G per slot.

For maximum performance, the Total Access 5000 SM40 or SM200 are required. The Combo PON OLT is also capable of supporting 21K subscribers per Total Access 5000 chassis when utilizing a 1:128 split.



The Juniper MX-204 is a universal routing platform that will interface with the transport electronics to providing connectivity to Boston and New York.

Internet Connectivity and Transport

We have identified Crocker Communications, a Greenfield, Massachusetts based company, to provide Internet and phone services for the Town. They have colocation facilities (PoP) in Boston, NYC, and Springfield, Massachusetts. Transport to those facilities shall be provided by the Connecticut Educational Network (CEN).

The proposed Juniper routers located in the Town are capable of scaling to redundant 100gbps upstream and downstream connections.

The core Crocker network in Boston is currently capable of 100gbps and can scale to over 5Tbps as demand increases.

Crocker maintains 3 core POPs with a full redundant and diverse routing backbone. Additional transport circuits can be added to interface with the town into any of the POPs to increase redundancy.

We have included pricing from CEN for redundant 10G transport circuits Boston MA and New York City. The network in Town shall be configured to dynamically route over all available transport connections.

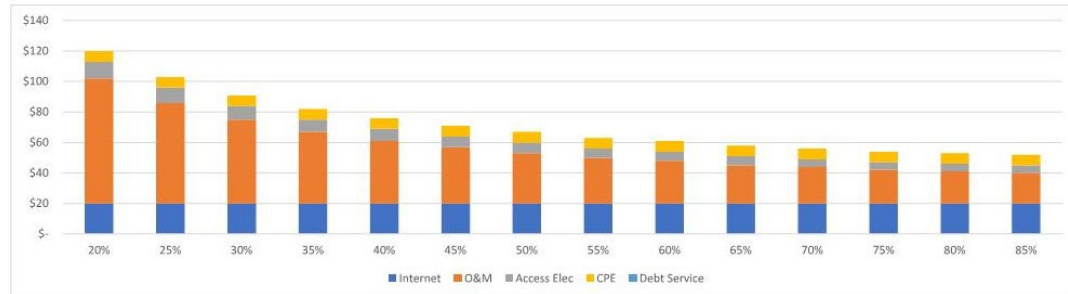
b. Network Ownership

The Town shall own 100% of the network assets, including all electronics. A network operations agreement with a third party shall provide for all operations, maintenance, and customer service. A separate Internet Service Provider (ISP) agreement shall be made with the Internet Service Provider, identified in this report as Crocker Communications, to provide internet service to subscribers. The Town may consider an Open Access network model in the future to offer multiple ISP services to its residents.

c. Financial Responsibilities

This municipal Fiber to the Home model utilizes municipal provided funding for 100% of the physical cable construction. The following analysis provides subscription costs of 1G symmetrical service at various take rate levels that would enable the Town to pay the capital expenditure debt service. Customer drop, connection and equipment costs are shown separately so alternative financing options can be considered for those portions.

SUBSCRIPTION RATE ANALYSIS



Subscriber Rate - 1G Symmetrical

	20%	25%	30%	35%	40%	45%	50%	55%	60%	65%	70%	75%	80%	85%
Internet	\$ 20	\$ 20	\$ 20	\$ 20	\$ 20	\$ 20	\$ 20	\$ 20	\$ 20	\$ 20	\$ 20	\$ 20	\$ 20	\$ 20
O&M	\$ 82	\$ 66	\$ 55	\$ 47	\$ 41	\$ 37	\$ 33	\$ 30	\$ 28	\$ 25	\$ 24	\$ 22	\$ 21	\$ 20
Access Elec	\$ 11	\$ 10	\$ 9	\$ 8	\$ 8	\$ 7	\$ 7	\$ 6	\$ 6	\$ 6	\$ 5	\$ 5	\$ 5	\$ 5
CPE	\$ 7	\$ 7	\$ 7	\$ 7	\$ 7	\$ 7	\$ 7	\$ 7	\$ 7	\$ 7	\$ 7	\$ 7	\$ 7	\$ 7
Debt Service	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total Subscription Fee	\$ 120	\$ 103	\$ 91	\$ 82	\$ 76	\$ 71	\$ 67	\$ 63	\$ 61	\$ 58	\$ 56	\$ 54	\$ 53	\$ 52
Average Drop Cost Recovery	\$ 23	\$ 23	\$ 23	\$ 23	\$ 23	\$ 23	\$ 23	\$ 23	\$ 23	\$ 23	\$ 23	\$ 23	\$ 23	\$ 23
Subscription with Drop Cost	\$ 143	\$ 126	\$ 114	\$ 105	\$ 99	\$ 94	\$ 90	\$ 86	\$ 84	\$ 81	\$ 79	\$ 77	\$ 76	\$ 75

See the following tables for details of drop costs and estimated operating expenses used in the subscription rate analysis.

Drop Cost Recovery

	OSP	ISP	VOIP	Total Cost	5 Years Monthly
Aerial	\$ 534	\$ 375	\$ 105	\$ 1,014	\$ 19.16
New UG	\$ 2,194	\$ 375	\$ 105	\$ 2,674	\$ 50.54
Average	\$ 724	\$ 375	\$ 105	\$ 1,204	\$ 22.76

Drop costs are per installation

Estimated Operational Expenses

	<u>UM</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Annual</u>
Website & Customer Engagement	Month	12	\$ 2,000	\$ 24,000
Media, PR, Content Coordination	Month	12	\$ 1,500	\$ 18,000
Administration and Legal	Year	1	\$ 15,000	\$ 15,000
Extended Care - Routers and OLT	Year	1	\$ 20,000	\$ 20,000
Transport Costs - 10G to Boston and NYC	Month	12	\$ 3,136	\$ 37,632
Electric	Month	12	\$ 1,000	\$ 12,000
Insurance	Year	1	\$ 15,000	\$ 15,000
Pole Maintenance (33 poles/mile)	Pole-Year		\$ 12	\$ -
Service Technicians	Hour	500	\$ 110	\$ 55,000
Fiber Optic Technician	Hour	240	\$ 159	\$ 38,160
2 Man Line Crew	Hour	60	\$ 228	\$ 13,680
Operations Administration and Management	Month	12	\$ 6,500	\$ 78,000
Miscellaneous Materials / expenses	1	1	\$ 3,160	\$ 3,160
	Total			\$ 329,632

d. Project Timeline / Completion

With pole line licensing and make ready being the largest factor, the project is estimated to take 24 to 30 months to fully complete. The following is a list of the major activities and milestones that shall be included within a final schedule:

- Website development and Community Engagement
- Headend and Colocation Facility Siting
- Establish Fiber Service Areas (FSA) and Feeder Design
- Design Transport Connection
- Start of Pre-Signups
- Determine order of FSA turnover.
- Pole Licensing – Feeder routes
- Pole Licensing – Distribution routes
- Fiber Distribution Network Design
- Underground Design
- Feeder Construction
- Distribution Construction (by FSA)
- Transport and Access Equipment Implementation

Leading priorities in establishing a launch schedule will be to launch the website, construct the headend, establish transport connections and construct feeder cable to each of the Fiber Service Areas. This will support a systematic approach to construction of the distribution network and customer connections in the shortest possible time.

e. Open Access Network

Building a network and launching a new service is a large undertaking. I cannot overstate the importance of inviting and engaging a subscriber base to making this venture a success. Residents will need to be satisfied with both the level and value of service they are receiving. The best way to accomplish this is to start off with a single Internet Service Provider. The Town would enter into a 5-10 year term contract and negotiate service plans that best fit the community needs. As the operation of the network matures and gains a reputation for quality and reliability, the town can evaluate an open access model.

Technology is not the issue. The proposed fiber design and electronics equipment platforms will fully support an open access network. The challenge in currently served areas are the business model viability for ISPs to enter your market and compete.

4. Subscriber Pricing / Experience

a. Subscriber Costs

All costs are provided in the pricing appendix 1. After the initial contract term pricing is subject to change based on evolving costs to provide service. Crocker will be agreeable to a “market” metric or escalation limit clause in the contract.

b. Affordability Plan

Crocker will integrate State and Federal funding/grant options into the pricing and billing system if available. The Town can also implement subscription subsidizing via various methods as needed to assist low-income families. Crocker has experience with FCC/USAC programs such as Life Line and EBB.

c. IP Address and Domain Name Service

Subscribers will be provided with dynamically assigned IPv4 & IPv6 addresses using appropriate dynamic protocols (DHCP, SLAAC). Static IPs are available to customers purchasing business class services.

All DNS will be configured with fully consistent forward and reverse lookups

d. Billing, Collections and Payment

Crocker Communications Inc. is a Service Provider operating in the New England region. Crocker has been providing residential and commercial Internet and Voice services for over 25 years.

Service Level Agreements

Residential & Commercial SLAs are based on overall Internet availability with KPIs for uptime, packet loss, latency & jitter. Credits may be issued for SLA violations based on the monthly recurring charges of the end-user.

Service Highlights:

- Sales and marketing activity to sell services to subscribers.
- Billing, collection, and payment of all monthly recurring charges to include Federal and State taxes, surcharges, and assessments.
- Standard Customer Service functions.
- Crocker operates a 24/7 Technical Support Call Center and Network Operation Center (NOC) for Tier I / II / III support.

e. Customer Service

Network Operations

The selected vendor should have regional experience working with multiple service providers and municipalities to construct, maintain, and provide customer installations for municipally owned fiber to the home (FTTH) networks. Installation technicians are expected to have experience working with a variety of equipment and electronics manufacturers including Adtran, Calix, and Nokia to ensure efficient and positive subscriber experience.

FTTX Customer Service

The selected vendor shall have a proven backend work order system that specifically addresses the needs of *Municipal FTTX customers*. The system shall fully integrate with all levels of the operational structure, including scheduling, delivery, tracking, and documentation. It should also provide seamless interface with the custom built Town Broadband website that is developed on the front end of the project. This will provide a powerful tool to manage construction through to operational needs.

Once a website is up and running residents should be able to get facts and updates about the project, download information about fiber drops, and find answers to frequently asked questions. It should also include details about subscribing for broadband Internet and phone service, streaming resources and other information as the network goes live. Because the website shall be fully integrated with the work order system and CRM it will provide real time access to information on all work orders completed, customer information, and all performance criteria for completed installations. Speed test data, PON level reading, terminal and equipment IDs, drawings and pictures of completed customer installations with customer approval signatures, ONT Serial Number, ONU MAC Number, FSAN numbers and VOIP information. Easy access to this information ensures the Network Operator will be able to efficiently operate and maintain the network.

The selected Network Operator shall have a highly trained and knowledgeable customer service department to help residents efficiently deal with their signup and installation needs. At a minimum it shall possess the following attributes:

- Technicians shall be fully trained and certified on FTTH installations.
- Background and criminal offender record information (CORI) check on all technicians
- State of the art Lap Top Computers and Tablets for complete electronic data entry in the field
- Technicians receives work orders daily from our customer service department.
- Installation documentation directly from the field into the Mobile System.
- Includes all documentation. Pictures, Speed Test, PON Level Readings, Customer Signatures
- Real Time Information enabling quickly reaction to schedule changes.
- More efficient use of cancellations and rescheduling
- Additional work requested by the homeowner can be documented and verified.

Internet Service Provider

Customer service will be provided 24/7 by Crocker CSR. Customers shall be able to open tickets via toll-free, email or web ticketing system. Customers shall have access via an online billing system to manage and pay invoices and update payment options.

f. Telephone Service

Crocker communications offers full telephone services. Telephone service is available from the POTS port on the ONT. UPS devices are available for purchase. Residents have a choice to sign up with Crocker for telephone services, remain with their existing provider such as Frontier, or subscribe for service with a third party VOIP provider.

g. Maintenance & Repairs

The Network Operator shall be responsible for all maintenance and repairs of the network and provide on-site customer service and installations for the municipally owned fiber to the home (FTTH) network.

APPENDICES