Schoharie County

Broadband Feasibility Study

Prepared For:

Schoharie County Economic Development Division

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Contents

1. EXECUTIVE SUMMARY

Broadband access is arguably one of the more important aspects of any thriving community today. With broadband access our educational system, our economic development efforts, our healthcare, and our business climate are all enhanced. This broadband feasibility study examines the availability of broadband access in Schoharie County, New York, (County) the technical aspects and challenges of extending broadband access to currently unserved residents of the County, and the feasibility of offering these enhanced opportunities using the latest technologies available.

The current state of broadband communications in the County is classified as unserved using the new FCC broadband definition of 25 MB down / 3 MB up announced on March 26, 2015. With the exception of Cobleskill, a few small concentrated village centers and a significant portion of MidTel (formerly The Middleburgh Telephone Company) service area, the majority of county residents lack access to broadband speeds of at least 6 MB down/ 1.5 MB up with a substantial number of customers having only dial up service or expensive satellite service/cellular data service with data cap limitations. This situation has clearly limited business opportunities in community centers, main streets, and home-based business, as well as educational opportunities in grade schools and high schools, colleges, universities and technical institutes, plus residential growth and public safety opportunities. Obviously there is a solid opportunity to reinvest in the telecommunications network to provide one of the basic needs for economic development in the County. Federal and state grants, most notably the recent introduction of the new NY State Broadband Grant program (NYS BB Grant), and low interest loans through the Rural Utilities Services arm of the US Department of Agriculture are available to fund construction of state of the art networks that can provide the fiber network foundation to build on for decades to come. While this investment will not, in and of itself, guarantee economic activity, without this critical investment the County will be eliminated from consideration by new businesses, existing businesses looking to expand, and new residents. Existing residents and visitors are disadvantaged by the lack of access to robust broadband services.

The primary distinction between this feasibility study and previous studies is the focus on building a network to provide service to end users, both residents and businesses. The focus on retail service rather than "open network backbone" service, which relies on others to provide actual end user services, is a more sustainable operational model than the open network model especially in the rural area that characterizes much of the County. It also emulates other successful enterprises by providing the business focus to enable the Schoharie County Economic Development Division and its potential partners in a Public Private Partnership (PPP) to build, operate and reinvest in the network to ensure long term success.

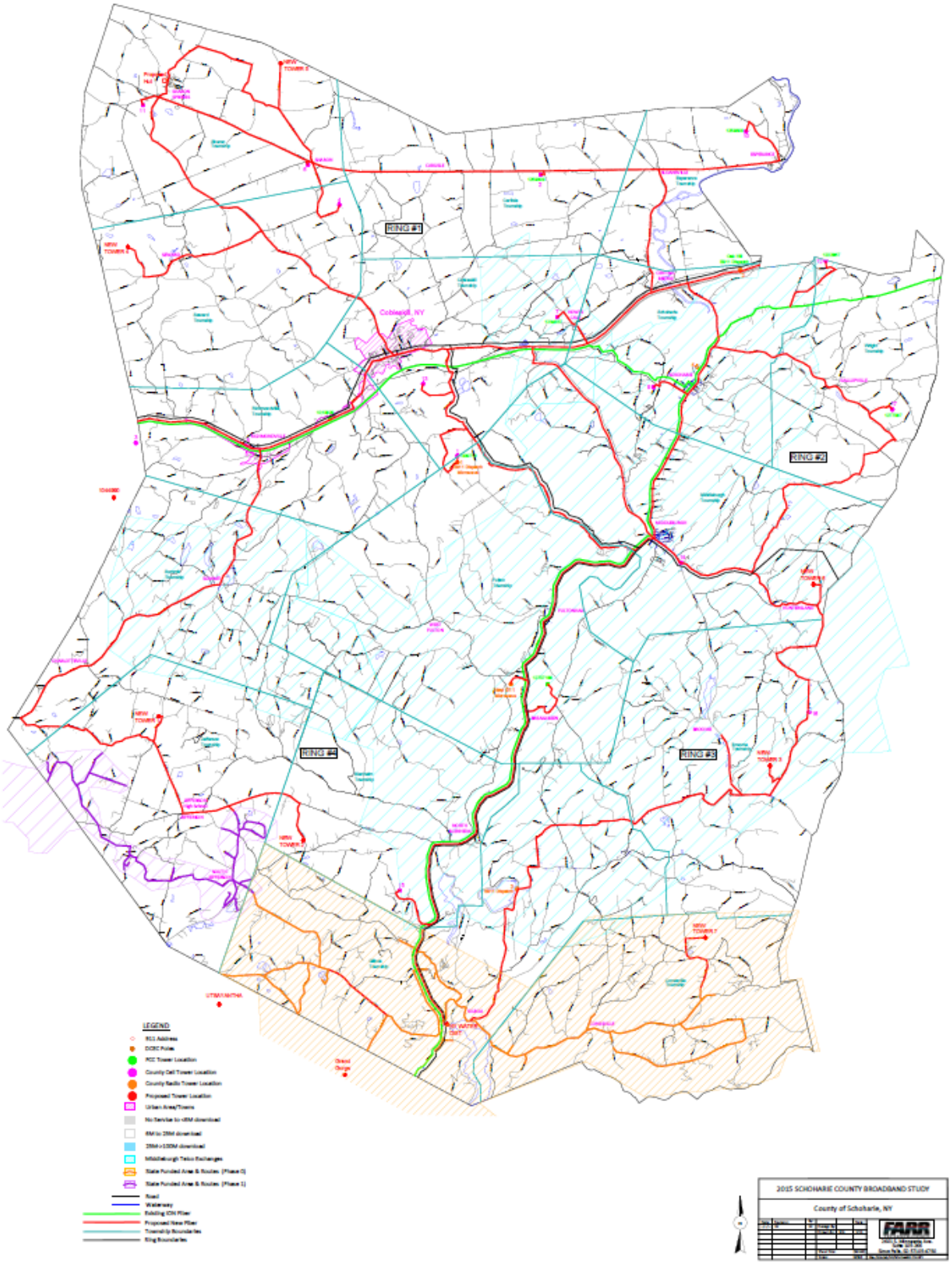
Based on a series of on-site meetings in March 2015, the demand for improved broadband service is evident. Various Schoharie County groups and organizations provided input for this study. Their participation enhances the future success of a county wide broadband project. Local participation brings important focus and grassroots support to the partnership required to understand the county's broadband needs. The following groups provided input:

- Board of Supervisors
- Emergency Management including Fire, Police Sheriff's Dept.
- County Treasurer's Office
- School District
- Citizens
- Community Organizations
- Business Leaders
- Schoharie County Managers

These constituents expressed their need for greater broadband coverage and capacity throughout the county. Strong demand and the NYS BB Grant offer a unique opportunity to build a broadband infrastructure that is fiscally prudent.

The Schoharie County Economic Development Division also has a strong lineup of potential private sector partners with substantial telecommunications assets, construction and operation expertise and local presence plus the public backing of the County paired with the NYS BB Grant to complete a formidable combination. This core group of potential partners has a couple of strong options to evaluate with their legal and accounting team to determine the optimum organization structure to provide the citizens, business community and government of Schoharie County with telecommunication service for the decades to come.

From a technical perspective, FARR recommends a hybrid network consisting of an unlicensed, fixed wireless network, accessing nearly 10,180 locations, connected to a 288 mile fiber optic backbone network including 235 new fiber miles and 53 existing fiber miles. The fiber optic backbone network will also be constructed to access approximately 4,650 Fiber to the Premise (FTTx) locations. The fiber network will pass through 25 population centers which will enable the project to offer Main Street businesses and community centers access to high speed fiber connections. These connections will enable the communities to attract, retain and grow existing businesses and offer all community members access to high speed connections. The total number of unserved locations capable of receiving high-speed data and voice service at a minimum speed of 25 MB down and 10 MB up (25/10 service) is approximately 91% of the total unserved locations in Schoharie County. To upgrade locations without 25/10 service, a combination of larger antenna, range extenders, micro cells, new tower sites and additional FTTx construction can be used as determined by the PPP. This network meets the twin objectives of cost feasibility for the present and cost effective expansion opportunities for the future. A diagram of the **Proposed Network Map** is shown on the following page:



Funding opportunities for the new network include both federal and state grants and loans. In order to accommodate the indeterminate timeline for funding, the project is broken into three phases based on the three fiber rings. These phases can be further subdivided to allow building of the backbone, wireless towers and FTTx connections depending on the funding sources.

Financially, the study projects a total investment of approximately $28M with the majority of the investments in the first two (2) years of the pro forma. The investment includes ten (10) new wireless towers and corresponding radio equipment, radio equipment on eighteen (18) existing towers, 235 miles of new fiber network construction, FTTx and backbone fiber electronics, 3,256 FTTx customer drops and customer premise equipment and 7,125 wireless customer premise equipment. Small additions will occur after initial construction period due to ongoing customer additions in the out years of the pro forma. The wireless and wireline network is proposed to be constructed on Rings 1 and 2 followed by Rings 3 and 4. The investment assumptions are:

- Fiber construction – Per mile estimates for construction existing pole lines is $37,000. The fiber construction estimate includes materials, labor, engineering, permits, and make ready costs.
- New Tower construction – Per location estimate is $236,000 including all equipment, labor, land, permits and engineering.
- Existing Tower construction – Per location estimate is $92,000 including all equipment, labor, land, permits and engineering.
- FTTx customer drops – Per location costs for a fiber drop, CPE and CPE installation is $1,825.
- Fixed wireless customer – Per location costs for wireless CPE and CPE installation is $550.

The assumptions that formulate the business plan are derived from a variety of sources such as vendor estimates, industry metrics, historical trends, and the 2008 Schoharie County Broadband survey as well as data gathered through conversations and interviews with interested parties in the County. The most significant revenue and expense assumptions are:

- Subscriber rates for voice and broadband – The study assumes $30 per month for voice service and $45 per month for broadband data service.
- Subscriber penetration rates – The study assumes aggressive penetration rates due to the apparent pent up demand exhibited by County residents outside of Cooperstown and Oneonta. The take rates for Rings 1 and 2 are 30% (60% x ½ year) in Year 0, 60% in Year 1, 65% in Year 2, 70% in Year 3, 70% in Year 4 and 70% in Year 5. Rings 3 and 4 take rates mirror Rings 1 and 2 rates starting in Year 1.
- Operating expenses – The study estimates the cost for sales, customer service, management, maintenance and operations staff, office space and equipment, operations and maintenance equipment and billing software. The study assumes that this estimate will conservatively approximate the cost of out sourcing some or all of these functions if the Public Private Partnership (PPP) decides to use subcontractors instead of building a new organization.

The business plan displays profitable operations, and positive cash flow throughout the six year projection period (years 0 – 5). Financial ratio benchmarks typically required by lending institutions have been met or exceeded.

2. EXISTING BROADBAND AVAILABILITY

Appendix A shows the current middle mile fiber infrastructure in the County. Currently, ION and MidTel (formerly The Middleburgh Telephone Company) have middle mile fiber located in the County. While there may be fibers available for backhaul applications, the requirements for this network will require new fiber construction along these routes to provide the fiber count needed for new and existing wireless towers and for FTTx deployment. Verizon and Time Warner Cable (TWC) are the other dominant telecommunications carriers in the County. TWC has middle mile fiber in the County and Tech Valley Communications has a contract with the local RIC to deliver high speed broadband service to several schools in the County. TWC advertises up to 20 MB / 2 MB service for $45 per month to residential, home-based business and Main Street business customers in densely populated communities in the County (Cobleskill, Sharon Springs, Sharon, Schoharie, Middleburgh, Esperance, Carlisle and Richmondville). However, based on meetings with County citizens, the availability claimed by TW is very limited even in the community centers and extensions outside of the concentration centers is only completed if the subscriber(s) pay for the line extensions at $35,000 to $40,000 per mile. Verizon advertises general availability of DSL broadband services up to 3 MB / 1 MB. However, based on meetings with County citizens, actual speeds are less than 1 MB / 0.5 MB. NYSEG and National Grid do not have any available middle mile fiber infrastructure in the County.

Wireless cellular voice and data service is available in limited areas of the County from Sprint, Verizon Wireless and ATT Wireless. However, based on meetings in Schoharie on 3/31/15, coverage south of the I-88 corridor is exceptionally poor. Satellite data service is available from HughesNet and DirectTV, however, speeds, limit on data bandwidth and pricing make this option a last resort for most residents.

3. TECHNICAL DESIGN TO EXPAND BROADBAND COVERAGE TO UNSERVED AREAS

The recommended technical design offers a blend of wired and fixed wireless service to locations in the unserved areas of the County. The specific technologies used are Fiber to the Premises (FTTx) and unlicensed fixed wireless data. The FTTx solution will be deployed to anchor institutions in the unserved population centers plus residences, home-based business, and town center businesses along the fiber route and to existing and new tower locations. For FTTx locations, the minimum speeds are 25 MB down and 25 MB up. The unlicensed, fixed wireless solution will be deployed to residences and businesses not located on the fiber route. The unlicensed spectrum is used because it has no purchase or lease cost for the spectrum. Wherever the Schoharie County Economic Development Division is the first carrier using the unlicensed spectrum, it can petition the FCC to force subsequent unlicensed carrier(s) to modify or cease operations if their service interferes with the Schoharie County Economic Development Division's service. This technology blend will provide

maximum, but not ubiquitous, coverage up to 80 MB downstream and ten (10) MB upstream data rate today with the opportunity to upgrade both technologies to faster speeds as electronic technology evolves. Neither a 100% FTTx nor 100% fixed wireless solution is financially feasible. Options for adding mobile wireless (cellular) data/voice are not part of the plan primarily due to the requirement to own or lease spectrum required to deploy this technology. The licensing or leasing costs coupled with the difficult terrain (hills, valleys, foliage) make this option financially infeasible. The basis of the proposed network is to build a core network that will provide a strong fiber infrastructure deep into the county allowing easier deployment with short build requirements. The fixed-wireless then provides a temporary broadband solution until fiber can be built out supported by the business economics for either development areas or hard to serve locations.

a) Outside Plant (OSP) Design (**Appendix A**)

The Schoharie County Economic Development Division is developing a design to provide a broadband network that will meet and exceed today's FCC standards for 25 Mbps downstream and three (3) Mbps upstream to a majority of the unserved locations. The Schoharie County Economic Development Division has several challenges to provide a broadband network to its constituents. The terrain is most of the county is hilly with portions in the Catskill Mountains. There are also many valleys, rivers, and ridges that create natural barriers to build around. There is the I-88 corridor that creates its own challenges for crossing and building dynamics that have limited other service providers from developing major fiber networks. Other providers who have constructed fiber in the county include Independent Optional Networks (ION) (parallel to I-88 corridor) and Time Warner Cable (fiber to some cell towers and some city centers).

The Schoharie County Economic Development Division is proposing a service based on a mix of wired FTTx networks along with fixed-wireless data solutions to provide an overall access network. As part of this project, Schoharie County can partner with two (2) service providers in the county, MidTel who provides communication services to about a third of the county and Margaretville Telephone Company (MTC) who has received NY Grant funds to provide service to portions of Jefferson, Gilboa and Conesville townships. The proposed FTTx network will support solutions up to 100 Mbps downstream and 10 Mbps upstream as required by the New NY Broadband Grant program passed and funded in 2015 by the State of New York.

As part of the Outside Plant (OSP) fiber design, the proposed fiber network will connect 25 village centers along with 27 towers for the fixed wireless data platform. The proposed solution will also connect anchor institutions with fiber (up to Gigabit Ethernet (GE) services) and deliver an FTTx solution to the county members along the fiber routes which route through many unserved areas. The FTTx network mixed with the Wireless Fixed Data platform will provide service to approximately 92% of the unserved customers in the County (15,747 served locations out of 17,138 - Census data – **Appendix D**).

b) Network Design

The designs provided show the proposed fiber routes, incorporating about 288 miles of new fiber builds and/or portions of 3rd party leased fiber. Third party leases have not been projected in the current study estimates but will be explored if the project is awarded to help with potential cost savings. These estimated fiber mileages are listed below:

Fiber Type	Miles
3rd Party Transport Fiber	52.99
Proposed New Fiber	234.66

This designed network is proposed to be divided into four (4) main transport fiber rings with a few linear paths as shown in the transport section. These proposed fiber rings mileages are shown below. The network is proposed to be built in two (2) phases, Ring 1 and 2 followed by Ring 3 and 4. For financial pro forma use, this spreads the build over two (2) years to keep capital expenditures to a manageable level. This schedule also facilitates a manageable construction schedule, turn up and customer acquisition timeline.

Ring 1	Miles
3rd Party Transport Fiber	0.00
Proposed New Fiber	62.12
Ring 1 Subtotal	62.12

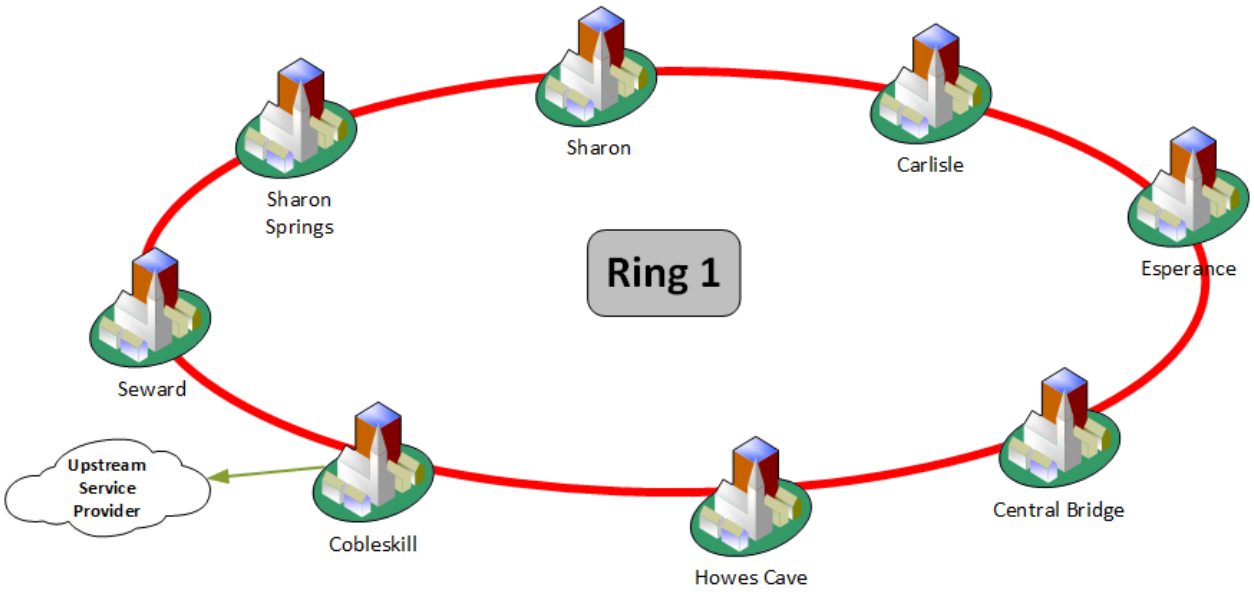
Ring 2	Miles
3rd Party Transport Fiber	22.21
Proposed New Fiber	53.60
Ring 2 Subtotal	75.81

Ring 3	Miles
3rd Party Transport Fiber	0.00
Proposed New Fiber	37.31
Ring 4 Subtotal	37.31

Ring 4	Miles
3rd Party Transport Fiber	30.78
Proposed New Fiber	81.63
Ring 4 Subtotal	112.41

Ring 1 is designed to server the northern section of the county above the I-88 corridor. This build includes the townships of Cobleskill, Richmondville, Sharon Springs, Sharon, Carlisle, Sloansville, Esperance, Central Bridge and Howes Cave. This ring is also projected to be completed in the first year of construction and will cover a large portion of the county's population centers. The Ring 1 route map is shown below:

Ring 1 Proposed Design

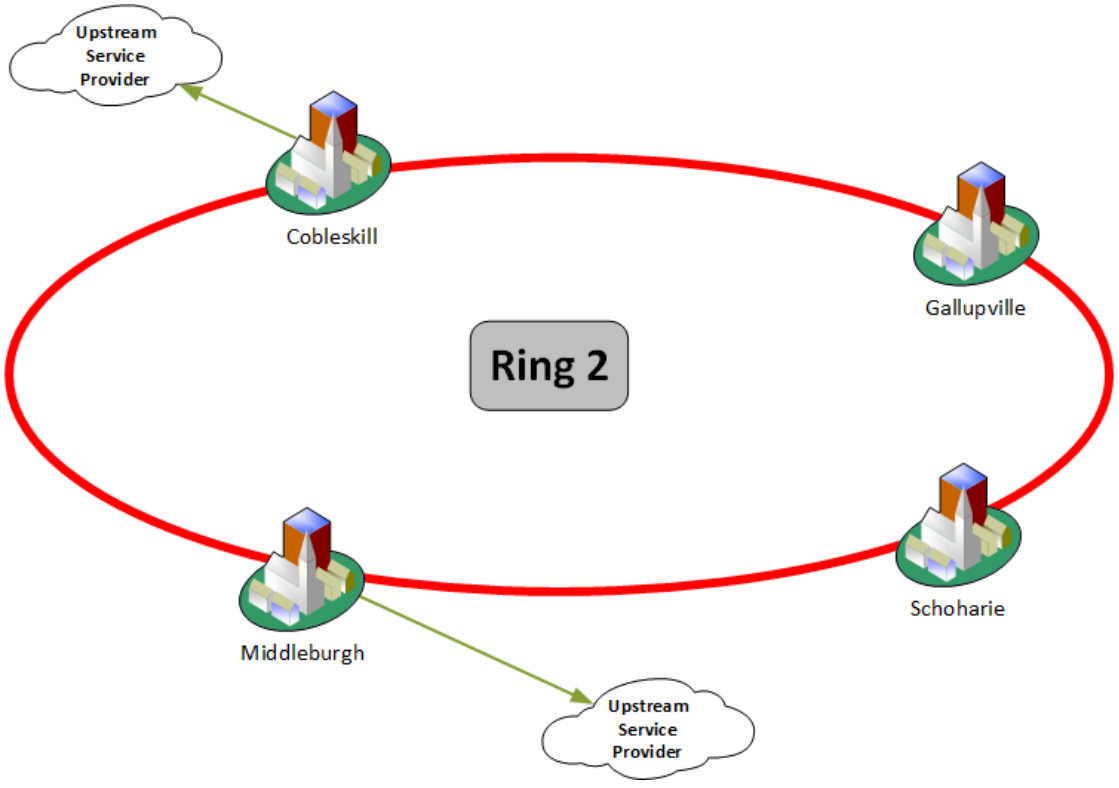


Ring 2 runs parallel in Ring 1's fiber binder. Ring 2 will follow along the I-88 corridor from Cobleskill to the Howes Cave and then southeast to Schoharie village to Middleburgh and back to Cobleskill. Ring 2 is also projected to be included in the first year build.

Together, Rings 1 and 2 will connect the two (2) large router sites to connect to other 3rd party service providers.

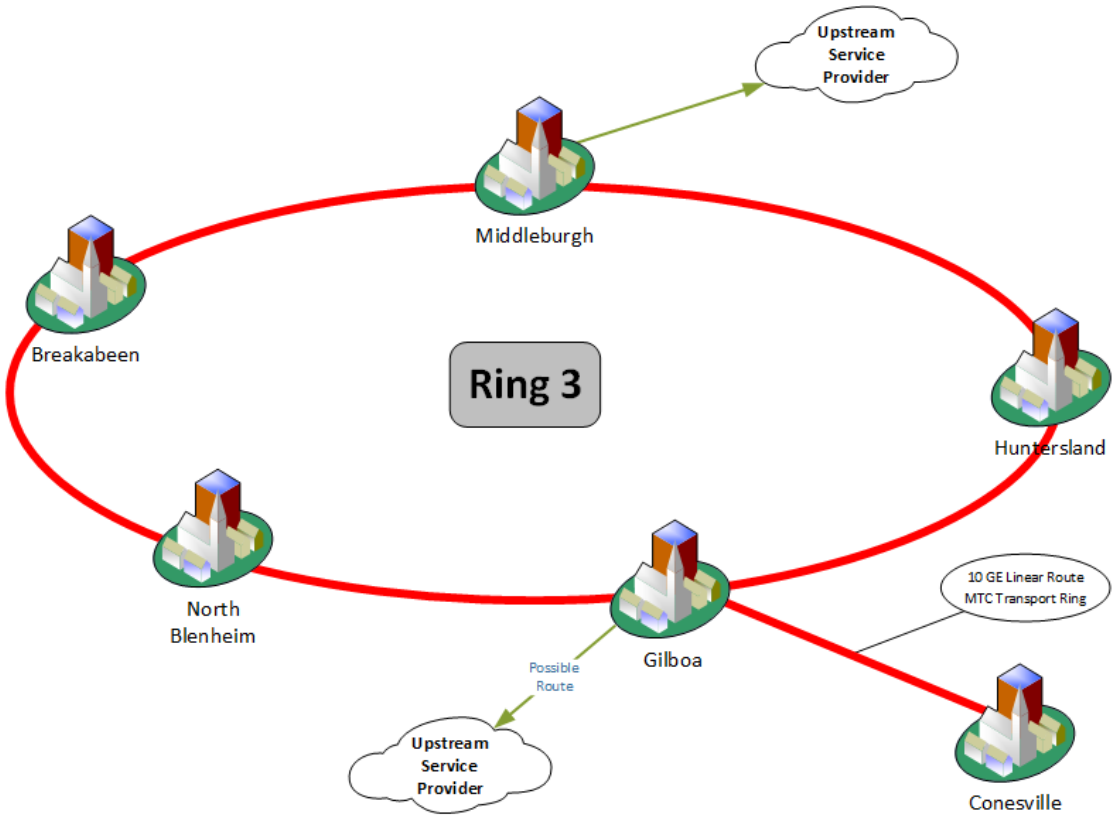
The Ring 2 route map is shown below.

Ring 2 Proposed Design



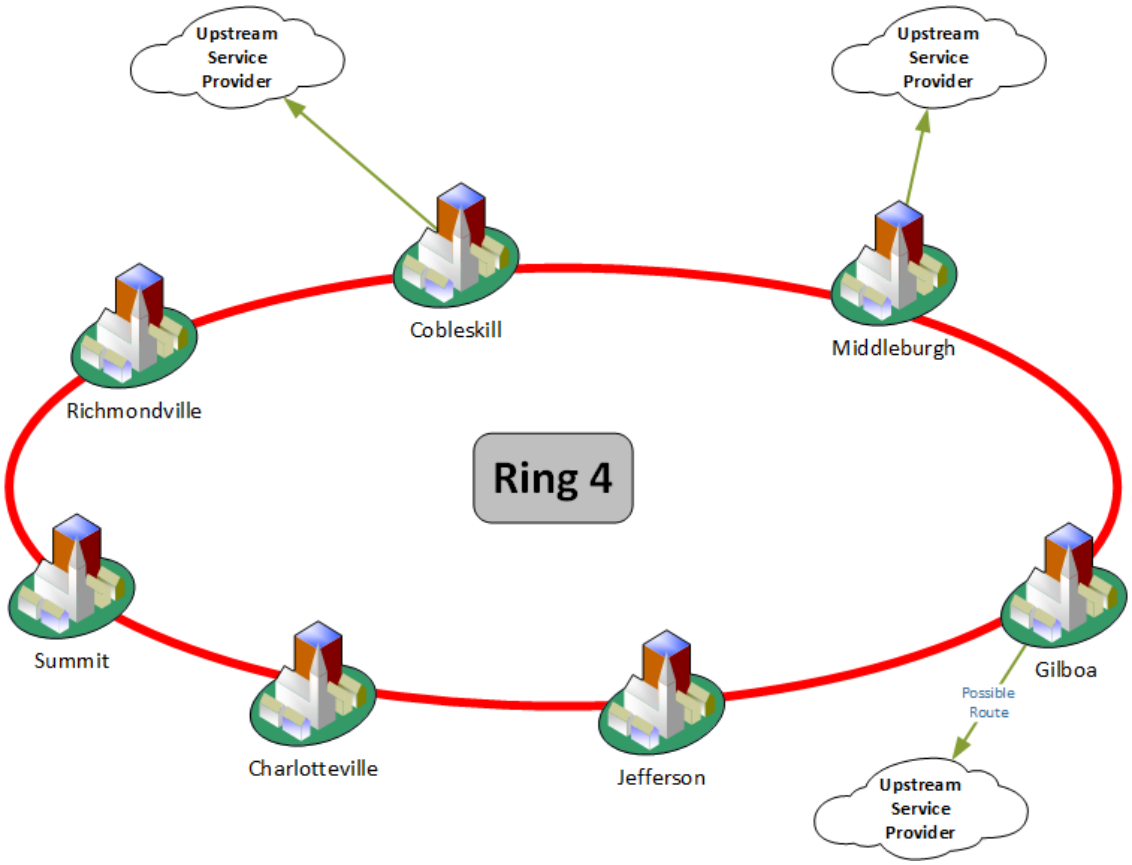
Ring 3 connects the southeastern portion of Schoharie County including the proposed MTC NY Grant builds. This build will connect from Middleburgh through Huntersland to Gilboa where the project will connect with MTC's network. It will connect North Blenheim, Breakabeen, Fultertonham, and back to Middleburgh. This ring will be part of the second year build. The Ring 3 route map is shown below:

Ring 3 Proposed Design



Ring 4 connects the southwestern portion of the county to the network. This fiber will connect Middleburgh to Gilboa and then route through the MTC NY Grant project to South Jefferson. From there, the route will connect Charottesville, Summit and Richmondville to Middleburgh along the I-88 corridor. This ring will be part of the second year build. The Ring 4 route map is shown below.

Ring 4 Proposed Design



As stated above, the proposed fiber has key support requirements. The proposed fiber route will support a ten (10) Gigabit Ethernet (GE) transport network described in the Section 4 Proposed Transport Network. This transport will provide Ethernet data and voice services to unserved subscribers along with other advanced broadband services discussed later in the FTTx section.

The fiber network will also connect the fixed wireless data towers to the 10 GE network transporting the customer data back to the core routers. These core routers are discussed in the transport section and are located at Cobleskill and Schoharie.

Lastly, a FTTx network will be connected to the 10 GE network delivering data, voice and advanced Ethernet services to residents, home-based and Main Street businesses and anchor institutions throughout the County.

c) Fiber Routes & Sizes

The Schoharie County Economic Development Division will face several OSP construction challenges from the I-88 construction corridors to rivers and construction in portions of the Catskill Mountains. The proposed project is planning to use existing power and communications pole lines to reduce construction costs and timelines. Schoharie County Economic Development Division expects some OSP delays working with NYSEG and National Grid who are the predominate power supplies for the county There is a small area of Delaware County Electric Cooperative (DCEC) in the southern portions of Jefferson township, but this area is already part of a NY Grant with MTC.

i. New Fiber

The proposed fiber routing uses 235 miles of newly proposed fiber to deliver broadband services throughout the County. Due to the proposed broadband speeds, FTTx solutions will be the key technology to meet this requirement and customer needs. The proposed fiber routes will be mainly aerial construction using existing Power (NYSEG or National Grid), Verizon, or MidTel poles lines. The proposed routes using the poles lines will be along existing road ways minimizing construction requirements. They may be some new pole lines to provide power and fiber to the new proposed towers. This new construction will be minimized when possible. Schoharie County will be required to enter into pole attachment leases for the proposed fiber which is accounted for as part of the financial proforma estimates of this proposal.

ii. 3rd Party Fiber

As part of the solution, ION currently has long-haul fiber route that runs through Schoharie County tying Otsego County to Albany County and MidTel to MTC. This route connects the service providers to network hand off points located in many sites throughout the state of New York. Due to limited fiber availability on this route, this project is not able to use fibers for access or dark fiber leasing so this study proposes over building many of these fiber routes with new fiber to connect proposed towers, FTTx locations and town centers.

d) Fiber Cable Sizes

The proposed fiber will meet the transport, fixed-wireless data and FTTx services for customers and anchor institutions. The following services require a minimum of 12 fibers for transport, 2-4 fibers per tower (depending on fiber optics used and distances between towers and electronics), and an average of 1.2-1.4 fibers per potential FTTx customer. For the proposed study, 288 fiber cables are the basis for the proposed solution.

The study recommends placing 288 fibers to deliver a transport network, deliver service to the proposed towers and provide the ability to deliver FTTx along the key throughways and unserved areas. As part of this proposal, the 288 fiber solution provides an average fiber size for cost purposes. An actual fiber design will use fiber sizes from 12 to 432 fiber strands.

Fiber Deployment

The study assumes aerial fiber construction. The rocky and hilly terrain makes any buried construction cost prohibitive. It also takes advantage of existing utility poles that are widely deployed throughout the county allowing for a fast and more cost effective deployment for the Schoharie County Economic Development Division.

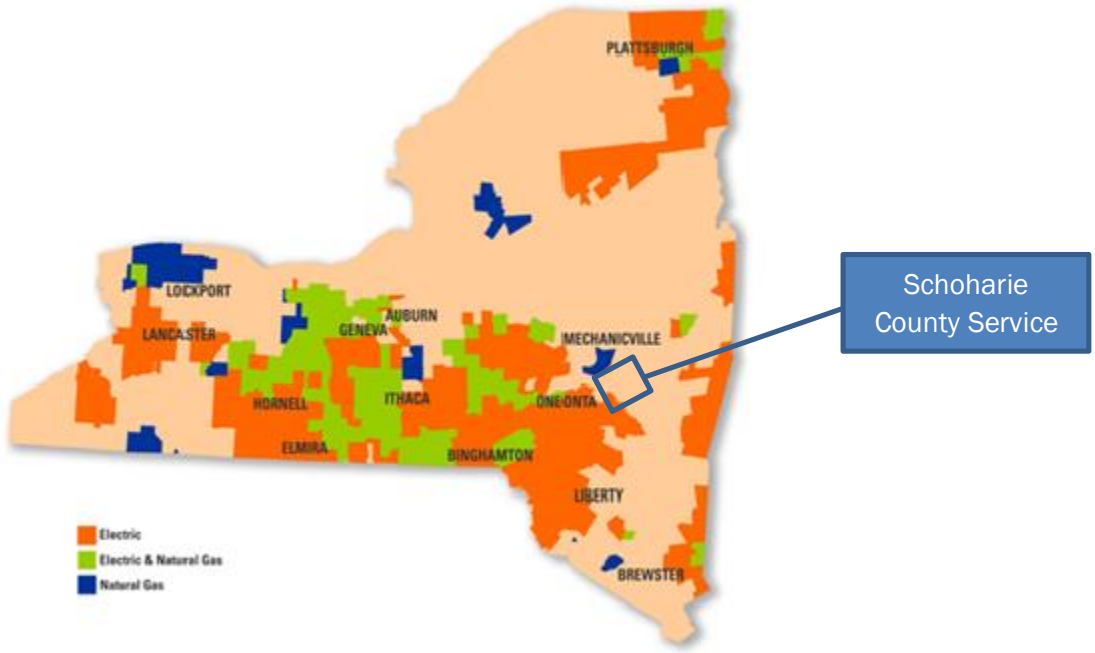
i. Aerial – Power Lines

The design uses existing power poles as these poles are widely deployed and provide power throughout the County. The project may be responsible to replace some poles as part of make ready work or place new poles for some new lines to the proposed existing or new wireless data towers. However, compared to the cost and time to build entirely new aerial lines, this strategy will improve the financial results. National Grid and NYSEG power companies provide service within the County boundaries and will be engaged during any actually construction designs. Their areas are discussed below. Delaware County Electric Cooperative (DCEC) also provides power within Jefferson Township, but currently is served by MTC and will not be included in this proposal.

a. New York State Electric & Gas (NYSEG)

The project will be required to engage with NYSEG to place fiber on the company's power poles. NYSEG will provide a limited working relationship, but will still provide financial and timeline advantages compared with a new pole line build. As a State of New York provider, NYSEG could provide partnership opportunities, but will require some coordination and discussions at the state level. NYSEG's serving area covers the southeastern portion of the County in the Gilboa and Conesville townships.

NYSEG Boundary Map



b. National Grid

The primary power pole provider in the County is National Grid. National Grid is a large provider covering multiple states and metropolitan areas mainly along east coast. There will be limited partnering capabilities with this company. National Grid's serving area covers the north 2/3 portion of Schoharie County and is the predominant provider. National Grid's service areas borders NYSEG service areas and will require more coordination to access pole lines. Based on experience with National Grid on other projects in the state, the study anticipates higher costs for make ready work and longer timelines for make ready construction.

National Grid Boundary Map

e) OSP Support

The study assumes that the PPP may either build a new organization or subcontract to both PPP members and non-members to support a countywide broadband network, especially for a facilities base fiber network. There are potentially strong partners able to provide valuable services and the Schoharie County Economic Development Division should look for partners that have experience deploying and servicing networks in rural areas and can meet the network and broadband requirements. Two of these potential local partners are MidTel and MTC. Any potential partner's participation is contingent on their acceptance of the project concept, scope and ultimate partner mix including the selection of the system operator.

i. Telecommunications Service Provider

A huge hurdle many municipalities and power companies face when trying to create a solution for their customers is creating and starting a business outside of their core competence. The benefits an established and experienced telecommunications service provider brings to the project is their knowledge of the communication business practices, procedures, regulatory requirements at both state and Federal levels, and experience in providing voice, video, and broadband services in rural areas. In addition they have a telecommunications platform in place and are established should be established as a facilities based CLEC in the state. An experienced partner allows for dramatic savings on start-up, staffing and training costs, and it is beneficial if they are

from the general area so they know and understand the geography and challenges of providing services in the Schoharie County's area.

f) Deployment Costs for Fiber

The proposed fiber facilities have several costs required to complete a build. The following items are a large portion of the OSP construction costs.

- Fiber Materials
- Construction labor
  - Construction
  - Trucks
  - Installation
  - Splicing
  - Man hours
- Transportation
- Lease and construction agreements
- Make ready work and pole replacements
- Pole leasing and ROW agreements
- Engineering and Design
- Project and Construction Management
- Mapping and GPS/GIS recording

These costs bring the estimated OSP costs to approximately $35,000-$38,000/mile. This cost in rural areas can easily exceed average costs of $3,000-$5,000/customer especially in the hilly areas of the south half of the county. Without grant or financial assistance this cost can easily limit any potential build by a service provider.

g) Operating Costs

The components for operating expenses must be a serious consideration as the operating expenses can quickly overwhelm capital costs if they are not taken into account early in the design and operations plan for the network. The following are some considerations.

- Fiber repairs
- Fiber and pole leases
- Electronic failures and repairs
- Electronic maintenance and upgrades
- Test and Provisioning equipment
- Staff training

Choosing the right service providers as a partner for the proposed project will help reduce many of these expenses by synergistically lowering the costs for most of these items since they have systems, staff and equipment in place.

h) Fiber to the Premise (FTTx) Overview

An added benefit of the fiber network is the ability to size the fiber along the build routes to provide Fiber to the Premise (FTTx) to residents, home-based and town center businesses, and anchor institutions. By adding the FTTx, the study anticipates the ability to incrementally provide state of the art services along major routes connecting village centers thereby filling in many areas that are not reached using the fixed wireless data network while connecting to the wireless towers. The proposed FTTx provides a solution that allows flexibility, bandwidth, and a future proof network for the County to use any of today's FTTx electronics (Passive Optical Networks (PON) and Active Gigabit (AG)) or future FTTx electronics without major alterations to the fiber optic cable.

1. OSP Fiber Sizing

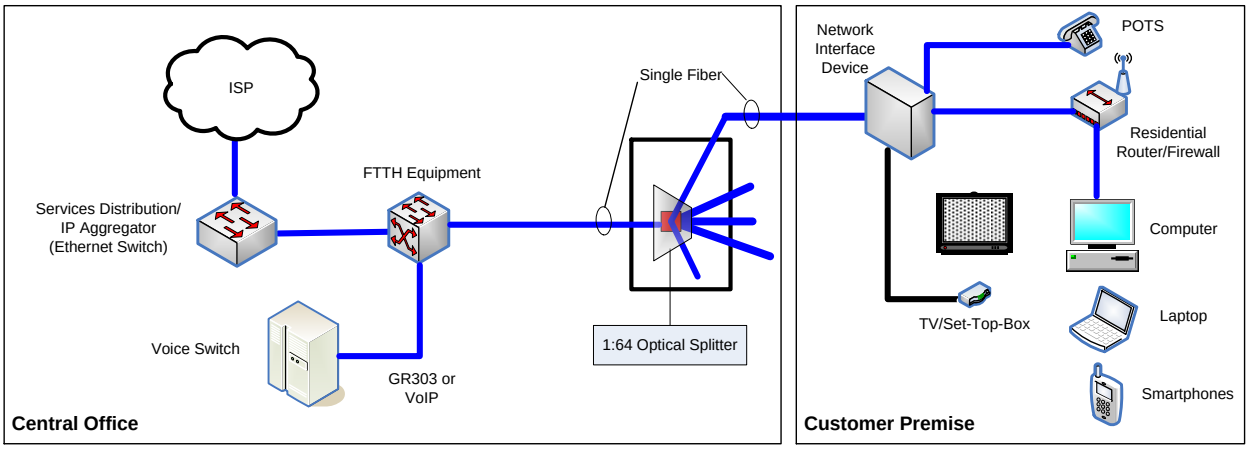
   As part of this proposal, the fiber sizing is based on providing a 288 fiber network for pricing. This fiber size is only an average and when actually deployed, the Schoharie County Economic Development Division's network will be sized based on field staking to correctly size each fiber segment during the network engineering phase of the project.

2. Passive Optical Networks (PON) & Active Gigabit (AG)

   The proposal is based on both Gigabit PON (GPON) and AG solutions providing a blended solution. The design described in this study has a very limited distinction between these technologies. It is basically adding splitters at the electronic locations or possible additional splitter capability in the field. By combining the cost benefits of GPON and the larger bandwidth with a point to point (P2P) capacity of AG technologies, the blended solution will meet any of the proposed demands of the customer requirements.

3. Passive Optical Network (PON)

   Today's technology is able to provide multiple Gigabit Ethernet (GE) networks to business and residential customers. The main technology widely deployed today is the Gigabit PON (GPON) to customers providing potentially 100+ Mbps to each customer. There are several new technologies entering the market that will provide service to more customers and/or provide more bandwidth. The proposed OSP FTTx design will support these technologies with only additions of electronics at the Central Office and/or customer locations, but without new fiber cable construction which is the most costly, time consuming, and disruptive task.



4. Active Gigabit Ethernet (AG)

   The difference an AG FTTx platform provides is a GE capacity circuit to each location without the splitter equipment used in PON design shown in the diagram above. The GE community initiative driving many of the current fiber builds are using the AG solution. It is purely a P2P network. Many business and anchor institutions will prefer the AG solution for the P2P network because of improved security and extra bandwidth. The AG FTTx design only changes one component in the above figure. The AG solution eliminates the splitters. Many FTTx service providers today blend PON and AG solutions depending upon their unique customer requirements. Many FTTx electronic vendors today are able to provide both services in one platform. This allows a service provider to deliver the network that fits a community's service requirements

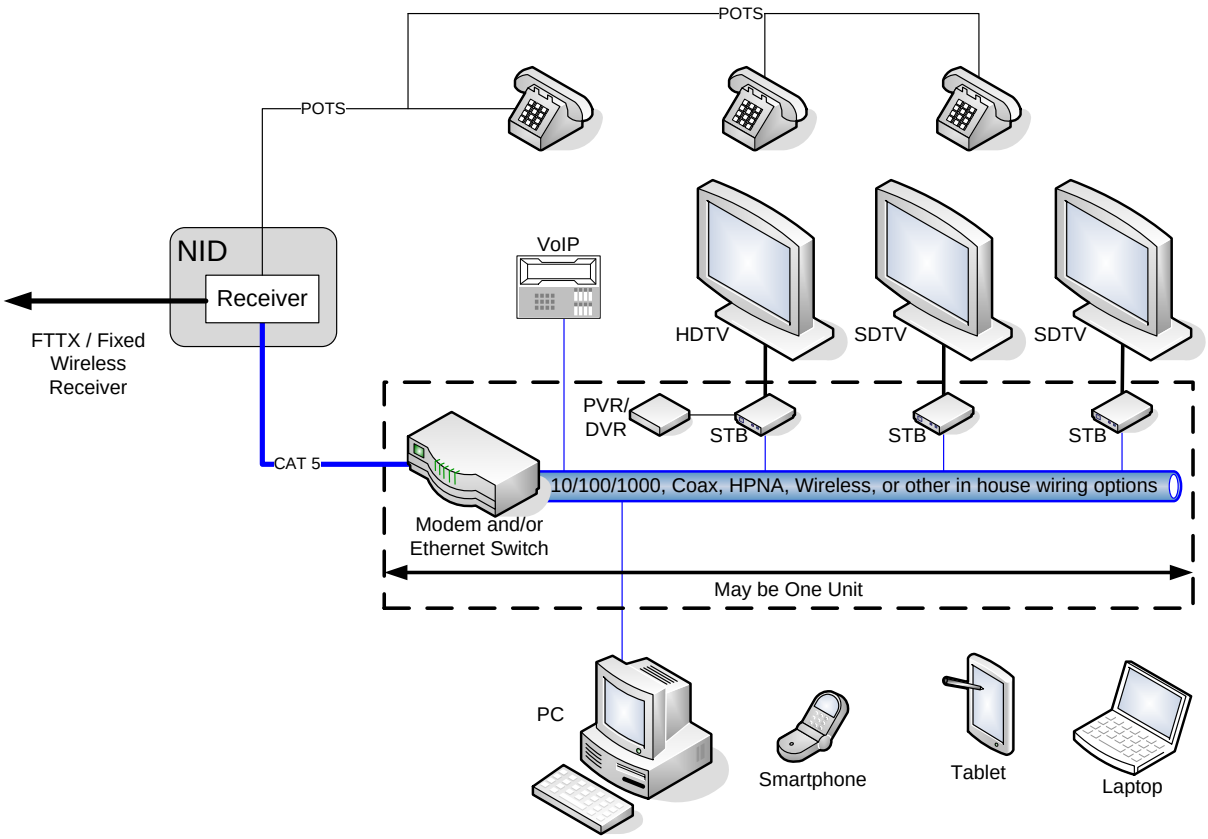
   To meet both PON and AG solutions, the OSP design brings the fiber back to the electronic locations. This design allows for the flexibility to move from one FTTx platform to another, but it also allows staff to work at a common location instead of having to turn up customers at multiple fiber splice points on the fiber routes. The OSP design concept is classified as an Active/Passive design and will be able to support current and future FTTx technologies.

5. OSP Drops/CPE Requirements

   Delivering the FTTx services to the customer require OSP fiber drops from the main fiber routes. During the design, the study assumes FTTx connections to all residents, businesses and anchor institutions located within about one quarter to one half (1/4 - 1/2) mile of the mainline fiber route. Using this design, the study uses a 600-foot fiber drop to estimate the average cost for the fiber drops in both the urban and rural areas. This study does not include any service in TWC areas as part of the proposed solution.

   Also covered in the study's cost assumptions are costs for the Customer Premise Equipment (CPE) and installation. These costs are to deploy the equipment shown in the

figure below. This figure is a typical residential deployment. The figure below also shows some of the advance broadband services that can be offered as part of this solution, including voice using traditional networks or Voice over IP (VoIP) networks, broadband data and Internet services, video using Coax and IPTV solutions, and new Over the Top (OTT) broadband applications for the Smart TVs, laptops, tablets, smartphones, and new Over the Top (OTT) hardware like Roku, AppleTV, etc.

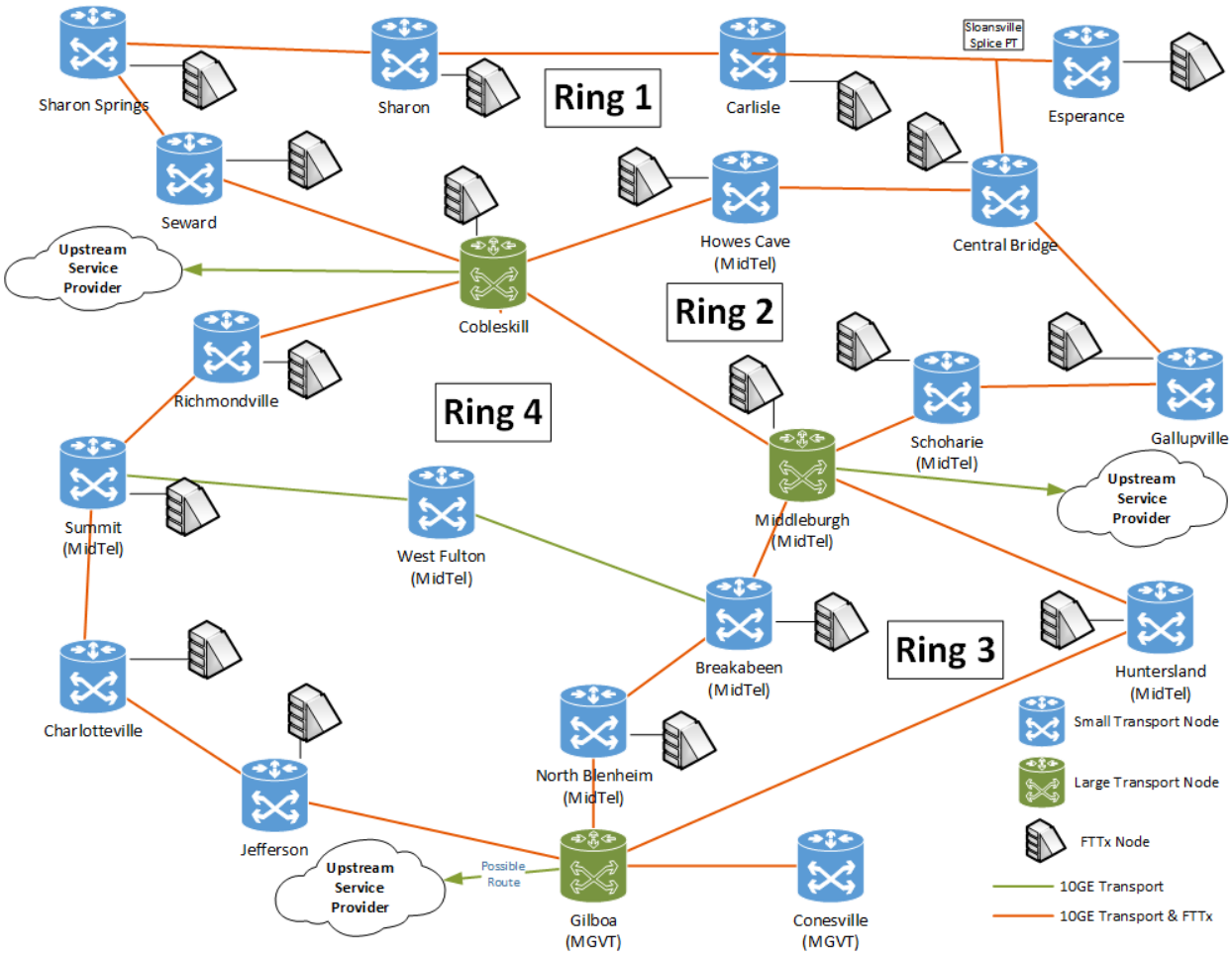


The study anticipates the need to install new wiring and access solutions inside customer premise locations required to take advantage of the fiber or wireless access speeds. Some locations may already have acceptable inside wiring solutions due to the location being served by HughesNET, WildBlue or some various DSL solutions, but due to the limited services available today to County residents it is very likely new wiring will be required for most of the locations served by the new network services like IPTV, OTT, gaming and other bandwidth drivers. The study includes the equipment cost for home wiring solutions at all study locations for new CAT 5 or higher Ethernet wiring or a wireless router access point plus installation labor.

4. PROPOSED TRANSPORT NETWORK

To provide network access between all cities, wireless towers and FTTx nodes, a 10 GE MPLS network is proposed. This network would allow the control to manage the Wireless and FTTx service traffic while providing the flexibility to provide other services as the network grows and new types of services are desired. Below is a high level diagram of the proposed network.

Proposed Transport Network



MPLS, which stands for Multi-Protocol Label Switching, is a highly efficient technology that allows for the creation of highly reliable point-to-point and point-to-multipoint services over an Ethernet/IP network. These services include such things as Internet, voice over IP, video and virtual private network (VPN) services.

The proposed MPLS transport network consists of 21 sites. The sites are as follows.

Large NODEs

Cobleskill	Gilboa	Middleburgh

Small NODEs

Breakabeen	Gallupville	Schoharie
Carlisle	Howes Cave	Seward
Central Bridge	Huntersland	Sharon
Charlotteville	Jefferson	Sharon Springs
Conesville	North Blenheim	Summit
Esperance	Richmondville	West Fulton

Of the listed sites, there are two types; large nodes and small nodes. Large nodes consist of more than two 10 GE transport interconnect points. These sites include Cobleskill, Middleburgh and Gilboa. These three (3) sites connect the other 18 smaller sites to form a redundant diverse route for the proposed four (4) multi-ring topology. By utilizing this multi-ring topology, the network becomes highly reliable and is better able to ensure the best quality of services to subscribers.

As part of this network, there are three (3) upstream service provider interconnect points. These interconnect points are in Cobleskill, Middleburgh and Gilboa. The upstream service provider will host the various services offered to the subscribers in this network.

Also, all sites are designed to transport services to the proposed FTTx equipment. These services will be similar to the wireless equipment, but can be provided at much higher speeds on dedicated fiber facilities that will greatly enhance the ability of home-based and Main Street businesses, residents, and community centers to compete in the 21st century.

5. WIRELESS BROADBAND

While FTTx is the optimum long-term solution for access, it is also the most costly technology solution especially in the rugged and low density population areas of the County. Consequently, the study includes fiber fed wireless broadband towers to serve customer premises with wireless in locations not located along proposed fiber routes.

The proposed system would use eighteen (18) existing tower locations while building ten (10) new tower locations. See **Appendix A** Maps for wireless tower locations and propagation maps for more detail information on tower locations and coverage.

As stated above, all tower locations would be fiber fed to support maximum bandwidth to the wireless users. The system will be comprised of a standards based LTE solution that supports LTE in 3550-3700MHz public spectrum.

The system is comprised of both indoor and outdoor CPE to support the most efficient deployment strategy. Bandwidth support will be based on distance from the tower and the receive antenna power levels. A table showing supported signal and bandwidth levels are shown in **Appendix E**.

Recently announced wireless broadband speeds are a significant improvement over the 2014 wireless equipment speeds (25 Mbps down at the short range loops). The new equipment can deliver 40 Mbps down over short to medium range loops and up to 80 Mbps down for short loops. Upload speeds of 7 Mbps for short to medium loops and nearly 8 Mbps are possible for short loops. As CPE upgrades become available, upload speeds of nearly 14 Mbps are possible.

a). Customer Premise Equipment (CPE)

The CPE units offer extended coverage and high data throughput, while maximizing cost and energy efficiency. Designed to address residential or enterprise needs, the CPE solution offers Quality of Service (QoS) management, flexible voice, data and WiFi configurations, as well as a carrier-class network management system to enable rapid expansions and effective fault management for quick resolution.

Customers benefit from a high performance solution that is simple to install, maintain and operate – helping to reduce CAPEX and OPEX. The advanced indoor/outdoor options operate in a range of frequency bands including the primary WiMAX 2.x and 3.x GHz bands. The product is interoperable and delivers a cost-effective, extended coverage 4G network solution. The high throughput and transmit power of the CPEs combine with the small tower footprint and high capacity, reducing the density of base stations required in a network layout, enabling faster, more affordable 4G deployments.

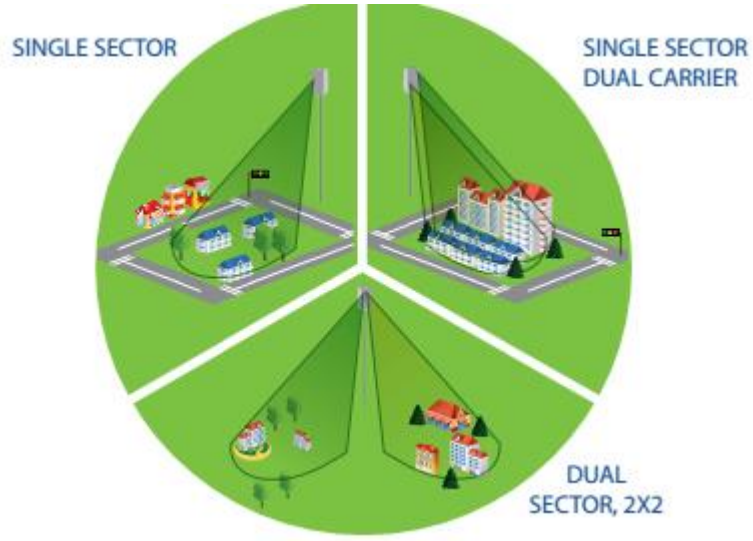
The CPE will eliminate complicated time-consuming installations. Whether indoor, outdoor, or a combination, the selected CPE solutions are easily and quickly installed. Utilizing innovative design features such as LED lights to indicate the most accurate signal alignment, small form factors, Power over Ethernet (POE) options and built-in web based configuration, a quick and efficient installation is ensured. Indoor units allow for a plug-&-play install that can be done end users or telecom employees. This will help to achieve fast time to market and revenue.

b). Base Station

The Base Station is a TD-LTE Advanced ready suite of all-outdoor base stations for fixed wireless access and is designed to achieve pervasive connectivity for both outdoor and indoor applications. The advanced base stations provide optimized coverage and capacity in a single, easy-to-deploy, small-footprint box. The Base Stations are ideal for virtually any deployment scenario, ranging from dense urban/urban, suburban, rural and remote areas.

The Base Stations are a Macro base station that packs superior performance into a small, single-box, small-footprint package. A small footprint, low power consumption, and a quick, easy rollout make it the optimal choice for our deployment.

The Base Stations are highly scalable, enabling various configurations and enhanced coverage and capacity. The 2/4x4 unit utilizes Multiple-In, Multiple-Out (MIMO) to provide diversity gain as well as increased data throughput rates with scalable sector configurations – up to two sectors and two carriers.



The Base Station system will support the following.

- Improved Total Cost of Ownership (TCO) with outdoor CPE and a more robust connection
- Optimized for Line of Sight and Near Line of Sight coverage areas
- 4RX x 4TX and Modem in a single, all-outdoor small form factor
- Highest capacity using Indoor & Outdoor CPEs and 4x4 4th order diversity

6. NETWORK COST ESTIMATE

The proposed project requires capital expenditures for wireless tower construction, fiber network construction, electronics, customer drops, and customer premise equipment. The pro forma financial statement assumes a 2 year construction period to complete the fiber network and to construct tower sites. The wireless and wireline networks are proposed to be constructed on Ring 1 and Ring 2 in Year 0, followed by Ring 3 and Ring 4 in Year 1. Additional costs for customer drops and customer premise equipment occur in Years 2 - 5. Capital expenditures are summarized as follows:

Capital Expenditures

Description	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Totals
Wireless Towers	$1,941,026	$3,431,787	$0	$0	$0		$5,372,813
Transport Network	$1,524,427	$594,749	$0	$0	$0		$2,119,176
Fiber	$4,274,960	$4,393,914	$0	$0	$0		$8,668,874
Customer Drops & Customer Premise Equipment:							
FTTH	$3,381,725	$2,135,250	$425,225	$0	$0	$0	$5,942,200
Wireless	$1,597,200	$2,042,150	$279,400	$0	$0	$0	$3,918,750
Startup Costs	$226,245	$0	$0	$0	$0		$226,245
Subtotal	$12,945,583	$12,597,850	$704,625	$0	$0	$0	$26,248,058
Work Equipment	$26,966	$109,262	$117,658	$117,658	$117,658	$117,658	$606,860
Office Equipment	$4,142	$16,740	$18,030	$18,030	$18,030	$18,030	$93,002
Capitalized Interest	$383,168	$375,704	$24,812	$4,006	$4,006	$4,006	$795,702
Subtotal	$414,276	$501,706	$160,500	$139,694	$139,694	$139,694	$1,495,564
Total Capital Investment	$13,359,859	$13,099,556	$865,125	$139,694	$139,694	$139,694	$27,743,622

Capital expenditures for customer drops and customer premise equipment continue beyond the initial 2 year construction phase to provide service to new customers. The customer drops and CPE are only incurred if customers subscribe to the service. A FTTx customer drop and CPE is estimated to cost $1,825 per customer. A wireless broadband subscriber's CPE and installation is estimated to cost $550 per customer.

Additional capital expenditures have been added for work and office equipment. These expenditures may become operating expenses in the form of "contracts for services" dependent upon the form of organization selected. For example billing services may be contracted to a 3rd party as opposed to purchasing a billing system.

7. FINANCIAL PRO FORMA / BUSINESS PLAN

The financial pro forma or business plan has been developed to determine the feasibility of providing unserved customers in the County with broadband access. The business plan displays profitable operations, and positive cash flow throughout the six year projection period (years 0 – 5). Financial ratio benchmarks typically required by lending institutions have been met or exceeded.

The assumptions that formulate the business plan are derived from a variety of sources such as vendor estimates, industry metrics, historical trends, as well as data gathered through conversations and interviews with interested parties. The key assumptions and highlights are discussed below. Additional information regarding the business plan assumptions can be found in the notes to the pro forma financial statements (see **Appendix B**).

Assets

Assets are depreciated based upon the projected useful life of the asset involved. The schedule of useful lives are as follows:

	Useful Life
Work Equipment	12 years
Office Equipment	8 years
Transport / Network Equipment	10 years
Fiber Cable / Wireless Towers	30 years

Liabilities / Funding

The pro forma financial statements carries the assumption that funding for the Schoharie County Economic Development Division broadband expansion project will come from a combination of federal/state/private grant and loan proceeds. The current assumption anticipates 50% grant funds and 50% loan funds. The financials were based on this assumption in large part due to typical grant requirements for 1:1 matching funds.

Loans Payable – Loans payable are a significant source of funding for the project. The loans payable are setup on a 15 year term with estimated interest expense set at 6%. Loan funds and grant funds have been accelerated in Year 0 to provide additional working capital. The accelerated funds are reduced from Year 1 and 2 funding requirements when sufficient cash flow allows.

Deferred grant revenue – The Deferred Grant Revenue represents the estimated grant funds to be received less the amount amortized and recognized as income. Deferred Grant Revenue is amortized over the average useful life of the assets the grant funds were used to purchase. Based on a weighted average calculation, the grant funds received are amortized over 14 years.

Revenues

Customer recurring revenue is directly impacted by subscriber penetration estimates. Through interviews with County personnel and residents, quality broadband and voice services are in high demand. Due to the perceived high demand for services the following customer penetration rates were used in the pro forma financial projections:

Customer Penetration Estimates

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Totals
New Customers (each year)							
Access to FTTx	3,089	1,561	0	0	0	0	4,650
Access to Wireless Broadband	4,841	5,339	0	0	0	0	10,180
Total	7,930	6,900	0	0	0	0	14,830
Cumulative Customers							
Access to FTTx	3,089	4,650	4,650	4,650	4,650	4,650	
Access to Wireless Broadband	4,841	10,180	10,180	10,180	10,180	10,180	
Total	7,930	14,830	14,830	14,830	14,830	14,830	
Customer Penetration Estimate	30%	65%	70%	70%	70%	70%	
Projected Customers Subscribing to Broadband and Voice Services:							
FTTx Customers	927	3,023	3,256	3,256	3,256	3,256	
Wireless Broadband Customers	1,452	6,617	7,125	7,125	7,125	7,125	
Total	2,379	9,640	10,381	10,381	10,381	10,381	

The estimates assume that customers gaining access to broadband in Year 0 will continue to be turned up during Year 1 while the second phase of construction begins. Customers gaining access in Year 1 will be turned up by the beginning of year 2.

Recurring revenues for both broadband and voice services for each subscribing customer have been projected in the pro forma. Voice rates are $30 per month with a modest increase projected to begin in year 2. Broadband rates are $45 per month and remain constant throughout the projected period. No additional revenue has been projected for long distance services or calling features.

Network access revenues are projected at an average of $7.77 per voice subscriber. These charges account for subscriber line charges required to be submitted to support the universal service fund. The average rate is an estimate to account for the differing rates between business and residential customers. A corresponding expense is also included in the pro forma to account for funds that will be submitted in conjunction with a carrier's FCC form 499.

Amortized grant revenue is includable in income and is amortized over the average useful life of the assets the grant funds were used to purchase. Based on a weighted average calculation, the grant funds received are amortized over 14 years.

Expenses

Expenses were projected based on historical trends experienced by other communications providers. Significant assumptions are highlighted below:

Tower lease expense – Tower lease expense has been projected for 3rd party leased towers and Schoharie County towers at a rate of $2,000 per month per tower site.

Expenses that have been projected for staffing and/or labor may be purchased as contract services depending upon the management and organizational structure selected. The expenditures represent an estimate of costs to operate the business with hired employees as opposed to contract services. This assumption should envelop the cost for contracted services.

Income and Property Taxes – An effort has been made in the pro forma financial statements to estimate the financial feasibility assuming a "for profit" taxable entity. Therefore the pro forma includes a line item for estimated income and property tax expenses. This assumption could be significantly affected by the type of organizational structure selected. Please review further comments regarding organizational structure options in the following section.

8. ORGANIZATION STRUCTURE / PARTNERSHIPS / BENEFICIARIES

The specific nature of the structure of the PPP for deployment of this network is ultimately a decision for the members of PPP. In the following paragraphs, the various options are described in detail for consideration of the PPP members.

FARR strongly recommends the PPP members consult with legal and accounting advisors to formulate the detailed structure of the organization. In addition to for profit corporations or LLCs, another option used in rural areas of other parts of the United States is a cooperative model. Especially compared to partnerships or joint ventures, the cooperative structure (and for profit corporations or LLCs) provides a long-term, stable organizational structure that is eligible for RUS loans and grants and NY BB Grant program grants, provides the liability protection of corporations, provides tax advantages for members/owners, and provides corporate structure familiarity for other broadband network lending and capital institutions.

Organization Structure options

Cooperative

Capital intensive industries like electric power and telecommunications have a long and successful history using this structure. Especially in rural areas like the County with its low density and difficult geography, cooperatives have been formed to serve their members first without being tied to private sector investment returns expectations. Membership in the cooperative could be very narrow, Telecommunications Service Provider(s) and Schoharie County Economic Development Division, or could be opened to all subscribers who choose to

use the services of the cooperative. This decision would rest with the founding members of the cooperative as they write their Articles of Organization and By Laws. Since cooperatives may be incorporated, the liability protection of corporations would be present.

The following excerpt from http://www.sba.gov/content/cooperative describes the organization and its advantages and disadvantages.

Cooperative

A cooperative is a business or organization owned by and operated for the benefit of those using its services. Profits and earnings generated by the cooperative are distributed among the members, also known as user-owners.

Typically, an elected board of directors and officers run the cooperative while regular members have voting power to control the direction of the cooperative. Members can become part of the cooperative by purchasing shares, though the amount of shares they hold does not affect the weight of their vote.

Cooperatives are common in the healthcare, retail, agriculture, art and restaurant industries.

Forming a Cooperative

Forming a cooperative is different from forming any other business entity. To start up, a group of potential members must agree on a common need and a strategy on how to meet that need. An organizing committee then conducts exploratory meetings, surveys, and cost and feasibility analyses before every member agrees with the business plan. Not all cooperatives are incorporated, though many choose to do so. If you decide to incorporate your cooperative, you must complete the following steps:

- File Articles of Incorporation. The articles of incorporation legitimizes your cooperative and includes information like the name of the cooperative, business location, purpose, duration of existence, and names of the incorporators, and capital structure. Once the charter members (also known as the incorporators) file with your state business entity registration office and the articles are approved, you should create bylaws for your cooperative.
- Create Bylaws. While the law does not require bylaws, they do need to comply with state law and are essential to the success of your cooperative. Bylaws list membership requirements, duties, responsibilities and other operational procedures that allow your cooperative to run smoothly. According to most state laws, the majority of your members must adopt articles of incorporation and bylaws. Consult an attorney to verify that your bylaws comply with state laws.
- Create a Membership Application. To recruit members and legally verify that they are part of the cooperative, you must create and issue a membership

application. Membership applications include names, signatures from the board of directors and member rights and benefits.

- **Conduct a Charter Member Meeting and Elect Directors.** During this meeting, charter members discuss and amend the proposed bylaws. By the end of the meeting, all of the charter members should vote to adopt the bylaws. If the board of directors were not named in the articles of incorporation, you must designate them during the charter meeting.
- **Obtain Licenses and Permits.** You must obtain relevant business licenses and permits. Regulations vary by industry, state and locality. Use our Licensing & Permits tool to find a list of federal, state and local permits, licenses and registrations you'll need to run a business.
- **Hiring Employees.** If you are hiring employees, read more about federal and state regulations for employers.

Each state will have slightly different laws that govern a cooperative. Consult an attorney, your Secretary of State or State Corporation Commissioner for more information regarding your state's specific laws.

Cooperative Taxes

Most businesses need to register with the IRS, register with state and local revenue agencies, and obtain a tax ID number or permit. A cooperative operates as a corporation and receives a "pass-through" designation from the IRS. More specifically, cooperatives do not pay federal income taxes as a business entity.

Instead, the cooperative's members pay federal taxes when they file their personal income tax. Members pay federal and state income tax on the margins earned by the cooperative, though the amount of taxation varies slightly by state. Cooperatives must follow the rules and regulations of the IRS's Subchapter T Cooperatives tax code to receive this type of tax treatment.

To file taxes on income received from cooperatives, please refer to IRS instructions on how to file Form 1099-PATR. More information about taxable distributions received from cooperatives is available at IRS.gov. If you create a consumer cooperative for retail sales of goods or services that are generally for personal, living, or family, you will need to file Form 3491 Consumer Cooperative Exemption Application for exemption from Form 1099-PATR.

Some cooperatives, like credit unions and rural utility cooperatives, are exempt from federal and state taxes due to the nature of their operations. Check with your state's income tax agency for information about state taxes.

Advantages of a Cooperative

- **Less Taxation.** Similar to an LLC, cooperatives that are incorporated normally are not taxed on surplus earnings (or patronage dividends) refunded to members. Therefore, members of a cooperative are only taxed once on their income from the cooperative and not on both the individual and the cooperative level.
- **Funding Opportunities.** Depending on the type of cooperative you own or participate in, there are a variety of government-sponsored grant programs to help you start. For example, the USDA Rural Development program offers grants to those establishing and operating new and existing rural development cooperatives.
- **Reduce Costs and Improve Products and Services.** By leveraging their size, cooperatives can more easily obtain discounts on supplies and other materials and services. Suppliers are more likely to give better products and services because they are working with a customer of more substantial size. Consequently, the members of the cooperative can focus on improving products and services.
- **Perpetual Existence.** A cooperative structure brings less disruption and more continuity to the business. Unlike other business structures, members in a cooperative can routinely join or leave the business without causing dissolution.
- **Democratic Organization.** Democracy is a defining element of cooperatives. The democratic structure of a cooperative ensures that it serves its members' needs. The amount of a member's monetary investment in the cooperative does not affect the weight of each vote, so no member-owner can dominate the decision-making process. The "one member-one vote" philosophy particularly appeals to smaller investors because they have as much say in the organization as does a larger investor.

Disadvantages of a Cooperative

- **Obtaining Capital through Investors.** Cooperatives may suffer from slower cash flow since a member's incentive to contribute depends on how much they use the cooperative's services and products. While the "one member-one vote" philosophy is appealing to small investors, larger investors may choose to invest their money elsewhere because a larger share investment in the cooperative does not translate to greater decision-making power.
- **Lack of Membership and Participation.** If members do not fully participate and perform their duties, whether it be voting or carrying out daily operations, then the business cannot operate at full capacity. If a lack of participation becomes an ongoing issue for a cooperative, it could risk losing members.

Not For Profit Corporation

The following excerpt from http://www.sba.gov/blogs/how-start-non-profit-organization-0 describes the organization and its advantages and disadvantages.

Incorporate Your Non-Profit - Becoming a non-profit corporation requires some paperwork, but for many groups the benefits of non-profit status - such as 501(c)(3) tax-exempt status - outweigh the complications. Here are *five reasons to incorporate your non-profit association.

Incorporation for non-profits is very similar to creating a regular corporation except that you have to take the extra steps of applying for tax-exempt status with the IRS and their state tax division.

Here are the steps you should take to incorporate your non-profit:

- ***Choose a Business Name*** - Get state-by-state information here on the various laws that apply to naming a non-profit in your state.
- ***File your Incorporation Paperwork*** - You must next file formal paperwork, or articles of incorporation, and pay a small filing fee to your state. These 'articles' contain basic structural information, such as the NPO's name, its registered agent and office address, and the corporation's membership structure, if any. Again, you can find information about filing these articles of incorporation by state here. You can also look up your state office through the *National Association of State Charity Officials (NASCO).
- Apply for Non-Profit Federal and State Tax Exemptions - Once you've received a copy of your article of incorporation from your state you are ready to submit an application to the IRS for your federal non-profit status as a 501(c)(3) organization. It's best to file within *27 months after the date of your incorporation.
- Create Corporate ***Bylaws*** - These are the operating rules for your non-profit corporation. Find out how to write non-profit bylaws *here.
- Appoint Initial Directors and Hold your First Board Meeting - Some states require that you appoint directors before filing your articles of incorporation. Get more information on choosing your board *here.
- Obtain Necessary Licenses and Permits - To determine what licenses you need, use this license and permit *online tool.

Start Fundraising - Now that your NPO is officially established you'll need to pay attention to its bread and butter – fundraising. While individual donors amount to the largest contributors to NPOs, federal and state and local governments offer grants, loans and programs to fund NPO projects. Check out these resources to find funding for your non-profit:

- The online Catalog of Federal Domestic Assistance gives you access to a database of all federal programs available to non-profit organizations and institutions.
- Grants.gov is another source to find and apply for federal government grants. The U.S. Department of Health and Human Services is a managing partner for Grants.gov, an initiative that is having an unparalleled impact on the grant community. Learn more about Grants.gov and how to find and apply for a grant that is right for your non-profit business.

You can also find other organizations that provide funds for NPOs at *foundationcenter.org.

Other Resources

The checklist above just skims the surface of the fundamentals of starting your own non-profit organization. There are many in-depth resources on the Web that are also worth bookmarking, including:

- USA.gov for Non-Profits - This site is the online version of what many companies offering CFDA assistance services use to advise their clients. It is available for FREE to all who wish to reference it. It has specific information for non-profits divided into 3 sections: grants/loans, management/operations, and tax information.
- *About.com Non-profit Portal - Covering everything from starting up, fundraising, and managing volunteers to marketing your non-profit, About.com's Non-Profit Guide is an invaluable and resource-rich Web portal.
- *Non-profit Guides - Free Web-based grant-writing tools for non-profit organizations, charitable and educational organizations, public organizations, and other community-minded groups.

Joint Venture / Partnership

The following excerpt from http://www.sba.gov/content/partnership describes the organization and its advantages and disadvantages.

Partnership

A partnership is a single business where two or more people share ownership.

Each partner contributes to all aspects of the business, including money, property, labor or skill. In return, each partner shares in the profits and losses of the business.

Because partnerships entail more than one person in the decision-making process, it's important to discuss a wide variety of issues up front and develop a legal partnership agreement. This agreement should document how future business decisions will be made, including how the partners will divide profits, resolve

disputes, change ownership (bring in new partners or buy out current partners) and how to dissolve the partnership. Although partnership agreements are not legally required, they are strongly recommended and it is considered extremely risky to operate without one.

Types of Partnerships

There are three general types of partnership arrangements:

- **General Partnerships** assume that profits, liability and management duties are divided equally among partners. If you opt for an unequal distribution, the percentages assigned to each partner must be documented in the partnership agreement.
- **Limited Partnerships** (also known as a partnership with limited liability) are more complex than general partnerships. Limited partnerships allow partners to have limited liability as well as limited input with management decisions. These limits depend on the extent of each partner's investment percentage. Limited partnerships are attractive to investors of short-term projects.
- **Joint Ventures** act as general partnership, but for only a limited period of time or for a single project. Partners in a joint venture can be recognized as an ongoing partnership if they continue the venture, but they must file as such.

Forming a Partnership

To form a partnership, you must register your business with your state, a process generally done through your Secretary of State's office.

You'll also need to establish your business name. For partnerships, your legal name is the name given in your partnership agreement or the last names of the partners. If you choose to operate under a name different than the officially registered name, you will most likely have to file a fictitious name (also known as an assumed name, trade name, or DBA name, short for "doing business as").

Once your business is registered, you must obtain business licenses and permits. Regulations vary by industry, state and locality. Use our Licensing & Permits tool to find a listing of federal, state and local permits, licenses and registrations you'll need to run a business.

If you are hiring employees, read more about federal and state regulations for employers.

Partnership Taxes

Most businesses will need to register with the IRS, register with state and local revenue agencies, and obtain a tax ID number or permit.

A partnership must file an “annual information return” to report the income, deductions, gains and losses from the business’s operations, but the business itself does not pay income tax. Instead, the business "passes through" any profits or losses to its partners. Partners include their respective share of the partnership's income or loss on their personal tax returns.

Partnership taxes generally include:

- Annual Return of Income
- Employment Taxes
- Excise Taxes

Partners in the partnership are responsible for several additional taxes, including:

- Income Tax
- Self-Employment Tax
- Estimated Tax

Filing information for partnerships:

- Partnerships must furnish copies of their Schedule K-1 (Form 1065) to all partners by the date Form 1065 is required to be filed, including extensions.
- Partners are not employees and should not be issued a Form W-2.

The IRS guide to Partnerships provides all relevant tax forms and additional information regarding their purpose and use.

Advantages of a Partnership

- **Easy and Inexpensive.** Partnerships are generally an inexpensive and easily formed business structure. The majority of time spent starting a partnership often focuses on developing the partnership agreement.
- **Shared Financial Commitment.** In a partnership, each partner is equally invested in the success of the business. Partnerships have the advantage of pooling resources to obtain capital. This could be beneficial in terms of securing credit, or by simply doubling your seed money.
- **Complementary Skills.** A good partnership should reap the benefits of being able to utilize the strengths, resources and expertise of each partner.
- **Partnership Incentives for Employees.** Partnerships have an employment advantage over other entities if they offer employees the opportunity to become a partner. Partnership incentives often attract highly motivated and qualified employees.

Disadvantages of a Partnership

- **Joint and Individual Liability.** Similar to sole proprietorships, partnerships retain full, shared liability among the owners. Partners are not only liable for their own actions, but also for the business debts and decisions made by other partners. In addition, the personal assets of all partners can be used to satisfy the partnership's debt.
- **Disagreements Among Partners.** With multiple partners, there are bound to be disagreements Partners should consult each other on all decisions, make compromises, and resolve disputes as amicably as possible.
- **Shared Profits.** Because partnerships are jointly owned, each partner must share the successes and profits of their business with the other partners. An unequal contribution of time, effort, or resources can cause discord among partners.

Potential Partners

As discussed previously, the primary partners in the ownership of the network are Schoharie County Economic Development Division, Schoharie County, and Telecommunications Service Provider(s). Clearly, other partners may be considered to address specific requirements of the network, however, these partners should own and operate the network.

Schoharie County

If the County decides to partner in the PPP, it has the potential to bring bonding capacity, access to wireless towers and County land and/or buildings, operational synergies, its financial and organizational stability and its name recognition.

Telecommunications Service Provider

A Telecommunications Service Provider brings its core competencies including network operations and maintenance, customer service operations, and knowledge of regulatory requirements at both state and Federal levels in rural areas. An experienced partner allows for dramatic savings on start-up, staffing and training costs, and it is beneficial if they are from the general area so they know and understand the geography and challenges of providing services in Schoharie County.

Project Beneficiaries

During on site meetings in March 2015, the potential beneficiaries showed a very strong level of need and support across all segments of the population for access to high speed broadband. The concerns were very similar across all groups:

- No or very poor voice and data cellular service.
- Many locations only have dial up access to the Internet.

- Outside of villages served by TWC's cable modems or MidTel's DSL, speeds are well below the current FCC 25 MB down / 3 MB up definition of broadband. For residents outside the cable modem/DSL footprint, satellite service and some terrestrial wireless broadband is available but the costs are high, speeds are well below the FCC broadband definition and subject to weather outages in heavy rain and snow conditions, and have usage limits (15 GB per month for satellite) that add substantial costs for heavy data users.
- Lack of broadband negatively impacts business and residential recruitment, existing business expansion, public safety services delivery, and educational services delivery.

The potential Telecommunication Service Provider partners provide the County an excellent opportunity to leverage existing customer operations and maintenance staff and customer operations and billing systems to lower operating costs. The project may also stabilize current employment in the County and possibly add new employment opportunities.

Schoharie County

Two County supervisors and four County managers met with FARR staff during March 2015. Concerns / issues identified included public safety, no/poor cellular voice and data coverage, expensive but limited broadband availability that limits ability to work from home, and large areas of the County only have dial up access. Top DSL speeds of 3 MB/0.4 MB are minimally acceptable for work at home. Many locations with access to DSL have less than 3 MB/0.4 MB speeds. One new E911 tower location was identified and is incorporated into the study.

The County is starting an initiative to track County vehicles to facilitate improved operations during snow removal, maintenance, EMS, and law enforcement operations. While the new towers will assist this system, access to fiber based networks throughout the County would make the system substantially more economical than a satellite based system. Additionally, the ability to have mobile/temporary PSAP operations would be enabled. This capability is especially important to the County due to the potential for flooding in the central part of the County.

The Census data (**Appendix D** http://quickfacts.census.gov/qfd/states/36/36095.html) shows that the County has declined 2.8% in population from 2010 to 2013 and has 20% of its population aged 62 and over. If the population center of Cobleskill (with SUNY – Cobleskill) is taken out of the equation, it is not hard to extrapolate that the remainder of the County will be markedly older and have a larger decline in population over the 2010 to 2013 time period. In spite of these demographic trends, the County has potential for commuters to Albany making their home in the County. The location of I-88 in the northern third of the County provides good access for commuters and tourists looking to get to the reservoirs in the southern part of the County which provides a rich variety of outdoor activities. These visitors place seasonal demands on the telecommunications and broadband infrastructure that are unmet with today's network. In addition, as revealed during the on-site meetings in March 2015, while the Census data shows 667 (2013 Census Data Estimate) work-at-home

individuals, the opportunity for a substantial increase in both additional year round and seasonal remote workers is evident if the network is available to support the requirements for remote workers. In fact, Census data estimates show a decrease in the number of work-at-home individuals between the 2010 estimate and the 2013 estimate which further suggests the negative impact of substandard broadband service.

County School Districts

Schoharie School District IT staff attended the meeting. Campuses across all of their district have 100% WiFi coverage and are served by high speed wireline connections for internet access. Schoharie School District has Google Chromebooks for its students and Sharon Springs School District provides IPads for its students. However, the lack of broadband in the students' homes severely restricts the effectiveness of this program. In particular, implementation of electronic textbooks in place of hard copy textbooks is not possible with the current state of broadband availability in the County. The consequences are both financial and operational. Hard copy textbooks cost $175 per student per year for science and history verses electronic textbooks which would be $20 per student per year for science and history. Use of electronic textbooks enables video/audio extensions to incorporate additional, current information.

County Residents and Businesses

Two citizens attended the meeting with FARR staff. Concerns included no cellular coverage in the northwest portion of the county, limited / expensive broadband coverage, high cost to extend lines ($30,000 cost to extend CATV lines north of Sharon Springs) and the difficulty of running small businesses, including numerous organic farms, and working from home. They noted that the Sharon Springs library WiFi hot spot has substantial usage due to the lack of high speed broadband in homes and businesses outside of the town center. They also noted that during the school year, some residents will use the school supplied IPads to create WiFi hotspots off of the school's WiFi networks.

County Emergency Services

FARR met with emergency management, fire department and sheriff department representatives in March 2015. The County is preparing to upgrade its Emergency Management PSAP/Command Center and move it to the Howes Cave area and adding a new Public Safety Building north of Schoharie. They are also adding new E911 tower sites near Breakabeen. All three locations will need fiber facilities. Additionally, the Broome Township is in a deep valley and wireless coverage is limited so the ability to access a fiber connection in the town center would be key to improving the emergency service in this area of the County. The group also expressed a need for fiber at the West Fulton Fire Department. Two addition sites, while not directly related to emergency management, were brought up during this discussion. The NY Power Authority dam site near North Blenheim and the Water Authority of NYC location near Gilboa are both possible sites for fiber connections. Additionally, the Water Authority of NYC has expressed a desire for wireless connections back to NYC and has the space to install a fiber fed tower on their property.

Funding Opportunities

Primary funding for broadband network construction is provide by Federal and State government entities. Each potential funding opportunity is discussed in more detail following this summary table. It is important to note that the FCC and RUS grants generally require a voice service offering to end-users.

Funding opportunities by construction year are summarized below.

Year	Grant / Loan	Maximum Amount	Possible Amount	Source	Notes
2015	Loan	$34M		RUS Broadband Loan	Pending update to 7 CFR 1738
2015	Grant	$500M for 2015-2018		New NY Broadband Fund	Funding approved
2015	Grant	$3M		RUS Community Connect Grant	Pending FY2015 funding legislation
2016	Loan	$TBD		RUS Broadband Loan	Pending update to 7 CFR 1738
2016	Grant	$500M for 2015-2018		New NY Broadband Fund	Funding approved
2017	Loan	$TBD		RUS Broadband Loan	Pending update to 7 CFR 1738
2017	Grant	$500M for 2015-2018		New NY Broadband Fund	Funding approved
2018	Grant	$500M for 2015-2018		New NY Broadband Fund	Funding approved

New NYS Broadband Grant Program – State of New York

As announced during Governor Cuomo's State of the State address in January 2015 and enacted in the 2015 budget passed on April 1, 2015, this program will distribute $500 million in grants for building high speed broadband networks in upstate New York. The program will be in effect during 2015 – 2018. The program is designed to be a matching program. RUS manages several programs to build networks in rural America which could be used to provide funds (and possibly be considered matching funds) in addition to the grant funds to complete the network. The application for this program is currently under development and is expected to be made public in Q2 of 2015.

Rural Utilities Services (RUS) – Department within the United States Department of Agriculture

RUS manages several programs to build networks in rural America.

Rural Broadband Loan Program (Farm Bill): Loans to build and upgrade broadband services in rural high cost areas (<20,000 population & not contiguous to urbanized areas >50,000)

- 100% rural service area
- Last mile projects with middle mile sections
  - Last mile service must be at 5Mbps or greater
- 25% of household are underserved households
  - Underserved = area or household that is not offered broadband service or offer broadband service by only one incumbent service provider
- Less than 3 incumbent service providers
  - Incumbent provides 3Mbps service to at least 5% of households
  - Satellite providers not considered
- Does not overlap current or pending RUS borrowers or grantees
- Loan award based on economic feasibility
  - Minimum Equity Requirement – 10% -but may be higher
- Eligible Loan Purposes
  - Covers capital costs and pre-loan expenses (up to 5%)
  - Loans made at treasury rates
  - One year principal deferment
  - First lien position on all assets and revenue of applicant
- Ineligible Loan Purposes
  - Operating expenses
  - Any cost incurred prior to the application being deemed complete (except pre-loan)
  - Acquisition of stock or facilities of an affiliate
  - Vehicles not for construction
- Additional Requirements
  - RUS makes a Preliminary Assessment
    - Is the service area rural
    - Does the service area overlap with current or pending RUS borrowers or grantees
  - Market Survey
    - For service offerings projecting more than a 20% penetration rate, a market survey is required

- Public Notice & Mapping Tool
- Map of each service area
- Number of underserved households
- Number of households without terrestrial based broadband service
- Types of proposed services
- 30 day public comments period

This program has not had a Notice of Funds Availability (NOFA) released as of the date of this report.

Community Connect Grant Program: Grants for broadband service providers and others to bring broadband services to remote rural areas (<20,000 population & not contiguous to urbanized areas >50,000)

- A nationally competitive grant program to provide broadband service to the most rural and economically challenged communities
- Since inception in 2002, the program has provided 243 grants and invested $142.2 million Serving Rural Areas and Communities of 20,000 population or less
- RUS published a proposed rule in the Federal Registeron November 16, 2012, which proposed a number of changes to the current regulation.
- Grantees must provide 15% matching
- Information about the program and success stories are available on the website at: http://www.rurdev.usda.gov/utp_commconnect.html
- To be eligible for a Community Connect grant, the Project must:
  - Serve a Proposed Funded Service Area (PFSA) in which Broadband Service does not exist;
  - Offer service at the Broadband Grant Speed to all residents and business customers within the PFSA;
  - Offer free service at the Broadband Grant Speed to all Critical Community Facilities (CCF) located within the PFSA for at least 2 years starting from the time service becomes available to each CCF; and
  - Provide a Community Center with at least two Computer Access Points and wireless access at the Broadband Grant Speed, free of all charges to users for at least 2 years.
  - Proposed Funded Service Area (PFSA) means the contiguous geographic area within an eligible Rural Area in which the applicant proposes to provide service at the Broadband Grant Speed
  - Rural Area means any area, as confirmed by the latest decennial census of the Bureau of the Census, which is not located within:
  - a city, town, or incorporated area that has a population greater than 20,000 inhabitants; or
  - An urbanized area contiguous and adjacent to a city or town that has a population of greater than 50,000 inhabitants. For purposes of the definition of rural area, an urbanized area means a densely populated territory as defined by the US Census Bureau.

This program has not had a Notice of Funds Availability (NOFA) released as of the date of this report.

Private Foundations

The largest fiber network private investments are being made by Google in several metropolitan areas, however, to date Google has not demonstrated interest in fiber networks serving rural areas similar to the County. Other than Google, there is limited funding provided by private foundations shown in a free database at; http://www.hmhco.com/educators/educational-services/grants-funding/free-grant-database.

Detail Search Results for Grant #125723

Surdna Foundation Grants from Surdna Foundation Inc.. The Surdna Foundation seeks to foster sustainable communities in the United States. The Foundation makes grants in three areas: Sustainable Environments- The Sustainable Environments Program works to overhaul the country's low performing infrastructure, with a new approach that will foster healthier, sustainable, and just communities; Strong Local Economies- The Strong Local Economies program supports the development of robust and sustainable economies that include a diversity of businesses and access to quality jobs. We work to spur the growth of local businesses, encourage equitable economic development, and improve the quality and availability of jobs for low-income people, communities of color, immigrants, and women; and Thriving Cultures- The Thriving Cultures program supports efforts to encourage teens to explore the arts, involve artists in community development projects and foster the growth and success of local artists as economic engines and agents for social change.

States: All States
Total Amount: $30,000,000.00
Average Amount: $1,000.00 - $250,000.00
Address: 330 Madison Ave., 30th Floor New York, NY 10017
Telephone: 212-557-0010
Email: grants@surdna.org
Website: click here
Eligibility: Other
Program Funded: Adult Literacy, After-School, Arts, At-Risk/Character, Community Involvement/Volunteerism, Facilities/Maintenance, Family Services, General Education, Health/PE, Homeless, Miscellaneous, Professional Development, Science/Environmental, Social Studies, Technology, Vocational
Deadline Comments: Ongoing

APPENDICES

A. Maps

B. Pro Forma Financial Statements

C. Pro Forma Financial Statements – Supporting Data

D. Census Data

E. Wireless Signal / Bandwidth Technical Data