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Otsego County
Broadband Feasibility Study

Prepared For:

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(COIDA)

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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 Otsego 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 the telecommunications network in the County is plagued by the limited incumbent carrier investment over decades, especially outside of the population centers of Oneonta and Cooperstown. While this situation has clearly limited business, especially those in community centers and main streets, and home-based business opportunities, educational both K-12 and colleges, universities and technical institutes, residential and public safety opportunities, 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 and low interest loans 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 investment the County will be eliminated from consideration by new businesses, existing businesses looking to expand, new residents, existing residents and visitors alike.

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 required to qualify for many of the grant and loan funding needed to build the network. It also emulates other successful enterprises by providing the business focus to enable the County of Otsego IDA and its potential partners to build, operate and reinvest in the network to ensure long term success.

Based on a series of on-site meetings in September, the unmet demand for service is extremely palpable. FARR staff have seen this type of demand before, resulting from extreme under-investment by incumbent carriers. In some cases, FARR staff has worked with clients that were able to capture in excess of 100% of the incumbent's subscriber base.

The County of Otsego IDA also has a strong lineup of potential public and private sector partners with substantial telecommunications assets, construction and operation expertise and local presence that paired with the County's bonding capability are 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 Otsego County with telecommunication service for the decades to come.

From a technical perspective, FARR recommends a hybrid network consisting of unlicensed, fixed wireless network, serving nearly 10,800 locations, connected to a 330 mile fiber optic backbone network. The fiber optic backbone network will also be constructed to serve approximately 9,000 Fiber to the Premise (FTTx) locations. The fiber network will pass through 13 population centers which will enable the project to offer Main Street and 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 and underserved locations capable of receiving high-speed data and voice

service at a minimum speed of 10 MB down and 1 MB up (10/1 service) is approximately 84% of the total unserved/underserved locations in Otsego County, and approximately 90% of the entirety of Otsego County. To upgrade locations without 10/1 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.

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 $30M with the majority of the investments in the first 3 years of the pro forma. The investment includes 10 new wireless towers and corresponding radio equipment, radio equipment on 15 existing towers, 211 miles of new fiber network construction, FTTx and backbone fiber electronics, 9,000 FTTx customer drops, and FTTx and wireless customer premise equipment. Small additions 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 Ring 1 first, followed by Ring 2 and finally Ring 3. The investment assumptions are:

- Fiber construction – Per mile estimates for construction on Otsego Electric Cooperative poles is $26,000. Per mile estimates for construction on poles owned by other power companies is $35,000. Both estimates include materials, labor, engineering, permits, and make ready costs.

- New Tower construction – Per location estimate is $207,000 including all equipment, labor, land, permits and engineering.

- Existing Tower construction – Per location estimate is $64,000 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 $850.

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 in Otsego 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 Ring 1 are 30% in Year 0, 60% in Year 1, 70% in Year 2, 75% in Year 3, 75% in Year 4 and 75% in Year 5. Ring 2 take rates mirror Ring 1 rates starting in Year 2 and Ring 3 take rates mirror Ring 1 rates starting in Year 3.

- 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 available for lease in the County. Currently, ION and Frontier Communications have middle mile fiber located in the County and have expressed willingness to lease bandwidth on the fiber. Verizon and Time Warner Cable are the other dominant telecommunications carriers in the County. Time Warner has middle mile fiber in the County as evidenced by its contract with RICs to deliver 100 Megabit or 1 Gigabit service to several schools in the County. Time Warner (TW) advertises up to 50 MB / 5 MB service to residential, home-based business and Main Street business customers in densely populated communities in the County (Cooperstown, Oneonta, Unadilla, Otego, Cherry Valley, Edmeston, Hartwick, Butternuts, Laurens, New Lisbon, and Richfield Springs). However, based on meetings with County citizens, the availability claimed by TW is very limited even in the community centers. 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. Frontier advertises 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. Otsego County Electric Cooperative, 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 Oneonta on 9/18/14, coverage outside of Cooperstown, Oneonta and the I-88 corridor is exceptionally poor. Satellite data service is available from Otsego Electric Cooperative, HughesNet and DirectTV, however, speeds, limit on data bandwidth and pricing make this option a last resort for most residents. Clarity Connect provides line of sight unlicensed wireless broadband service primarily to Oneonta, Cooperstown and Milford.

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 Main Street 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 County of Otsego IDA is the first carrier using the unlicensed spectrum, it can petition the FCC to force subsequent unlicensed

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carrier(s) to modify or cease operations if their service interferes with the County of Otsego IDA's service. This technology blend will provide maximum, but not ubiquitous, coverage at a minimum 10 MB down and 1 MB up 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.

a) Outside Plant (OSP) Design (Appendices A-C)

The County of Otsego IDA is developing a design to provide a broadband network that will meet today's FCC standards for ten (10) Mbps downstream and one (1) Mbps upstream to a majority of the unserved residential base. The County of Otsego IDA has several challenges to provide a broadband network to its constituents. The terrain is very hilly with many valleys, rivers, and ridges. With the exception of ION, the current providers have limited fiber builds that exist primarily along the I-88 highway system, the major throughway in the county. There are limited service providers with fiber transport options available to the County of Otsego IDA.

The County of Otsego IDA is proposing a service based on a mix of wired FTTx networks along with fixed-wireless data solutions. As part of the Outside Plant (OSP) fiber design, the proposed fiber network will connect 13 village centers along with 25 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 84% of the unserved customers in the County (19,848 served locations out of 23,500 locations excluding Oneonta and Cooperstown per 2010 Census data – Appendix E).

b) Network Design

The designs provided show the proposed fiber routes, incorporating about 330 miles of new fiber builds, and fiber leasing and optical transport using 3rd party solutions. These estimated fiber mileages are listed below:

Fiber Type	Miles
3rd Party 36 Fiber Leased	17.84
3rd Party 96 Fiber Owned	69.37
3rd Party Proposed Build	32.91
Proposed Fiber Otsego Electric Cooperative	131.33
Other Power Company (NYSEG, National Grid)	80.35

This designed network is proposed to be divided into two (2) main transport fiber rings with a third proposed linear path as shown in the transport section. These proposed fiber rings mileages are shown below. The proposal stages a deployed network, Ring 1 then Ring 2 followed by Ring 3. For financial pro forma use, this spreads the build over three (3) years to

assist finance expenditures to a manageable level. This schedule also provides a manageable construction, turn up and customer acquisition timeline.

Ring 1	Miles
3rd Party 36 Fiber Leased	17.84
3rd Party 96 Fiber Owned	33.17
Proposed Fiber Otsego Electric Cooperative	106.31
Ring 1 Subtotal	157.32

Ring 2	Miles
3rd Party 96 Fiber Owned	36.19
3rd Party Proposed Build	8.98
Proposed Fiber Otsego Electric Cooperative	18.01
Other Power Company (NYSEG, National Grid)	80.35
Ring 2 Subtotal	143.53

Ring 3 (Linear Ring)	Miles
3rd Party Proposed Build	23.93
Proposed Fiber Otsego Electric Cooperative	6.86
Ring 3 Subtotal	30.79

Ring 1 connects the primary points of interest as part of the initial build. This ring ties Oneonta and Cooperstown connection points along with eight (8) towers serving the central and most of the western half of the County including the Route 7 coordinator up to Edmeston. This proposed fiber design provides access to 5,200 potential FTTx and 2,330 fixed wireless customers.

Ring 2 connects the east half of the County with a large portion of the unserved territory serving thirteen (13) towers. This area has the most difficult terrain to cover with fiber or wireless due to the multiple ridge lines running northwest to southeast through the County. This fiber ring also has more new towers requiring additional site preparation and lease agreements. This increases the construction time. This proposed fiber design provides access to 3,600 potential FTTx and 8,059 fixed wireless customers.

Ring 3 brings together a path from Richfield Springs to Edmeston tying in two (2) towers. This path could use both newly constructed fiber and lit fiber from a 3rd party fiber owner. This proposed fiber design provides access to 80 potential FTTx and 448 Fixed-wireless customers.

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 under other sections in this group. This transport will provide Ethernet data and voice services to unserved subscribers along with other advanced broadband services discussed later in the FTTx section.

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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 Cooperstown and Oneonta.

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

c) Fiber Routes & Sizes

The County of Otsego IDA has several challenges to deliver a fully deployed fiber network. The terrain limits fiber paths along some of the existing road-ways. We will use existing power pole lines to reduce the construction costs and limit new construction due to strict permitting and environmental requirements in the State of New York.

i. New Fiber

The proposed fiber routing uses 211 miles of newly proposed fiber to deliver broadband services throughout the County. Most of this new construction is planned for existing power pole routes using Otsego Electric Cooperative, New York State Electric and Gas (NYSEG) and/or National Grid. This routing will allow the use of existing poles limiting new construction routes and maintenance to maintain these path lines.

ii. Third Party Fiber

As part of the solution, Independent Optical Network (ION) currently has 120 miles of existing or proposed fiber throughout the County. ION's proposed fiber route represented in the network attachments shows the fiber route running along State Hwy 7 from the County's east border to Oneonta. This route then connects Oneonta to Cooperstown through Laurens, Hartwick, and Hyde Park. The route then follows State Rt. 28 to State Rt. 51 and leaves the County on State Rt. 20 to the west. ION is also proposing a new fiber build from Cooperstown to Richfield Springs as part of the Industrial Park initiative and then routing fiber back toward Edmeston ending on State Rt. 50 just east of the village.

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. If FTTx is removed from the study, 96 fiber cables would be used for the transport, fixed wireless data, and anchor institutions connections.

i. 288 Fibers

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. The cost difference shown below is the difference between the 288

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fiber build verses a 96 fiber build. The 288 fiber design provides a FTTx solution, which also requires more splice points and equipment to support.

Construction Cost of 288 Fiber vs 96 Fiber	288 Fiber	96 Fiber	Difference
Material Cost	$13,500 / mile	$6,100 / mile	$7,400 / mile
Labor Cost	$8,500 / mile	$7,400 / mile	$1,100 / mile
Reel Distance*	10,000 ft / Reel	20,000 ft / Reel	10,000 ft / Reel

*Increased distance per real reduces the quantity of splices

ii. 96 Fibers

To reduce cost, the County of Otsego IDA can reduce the FTTx capabilities and down size the fiber sizes to provide only transport, broadband service to towers and connections to key anchor institutions. This option would provide a savings over the 288 fiber design but would also reduce the number of served locations, limit future potential to expand FTTx connections and drastically reduce available bandwidth to many locations which will limit future broadband services offerings.

e) Fiber Deployment

The study is assumes aerial fiber construction. This 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 County of Otsego IDA.

iii. 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. The following power companies provide service within the County boundaries and will be engaged during any actually construction designs.

a. Otsego Electric Cooperative (OEC)

The County of Otsego IDA is exploring a partnership with the Otsego Electric Cooperative who provides service to approximately 2/3 of the geographic area of the County. If consummated, this partnership would allow for the use of OEC's power poles at discounted rates, staff and equipment construction assistance, and future staff and equipment maintenance support. OEC's existing network follows along several of the proposed fiber routes and will greatly reduce the OSP construction cost. This partnership could be a win-win for both parties as OEC has been researching broadband services for their customers and needs remote access and

reporting for their power equipment. This new broadband service will meet both objectives. See the following map representing OEC's current transmission line paths.

OEC Boundary Map

OTSEGO ELECTRIC COOPERATIVE
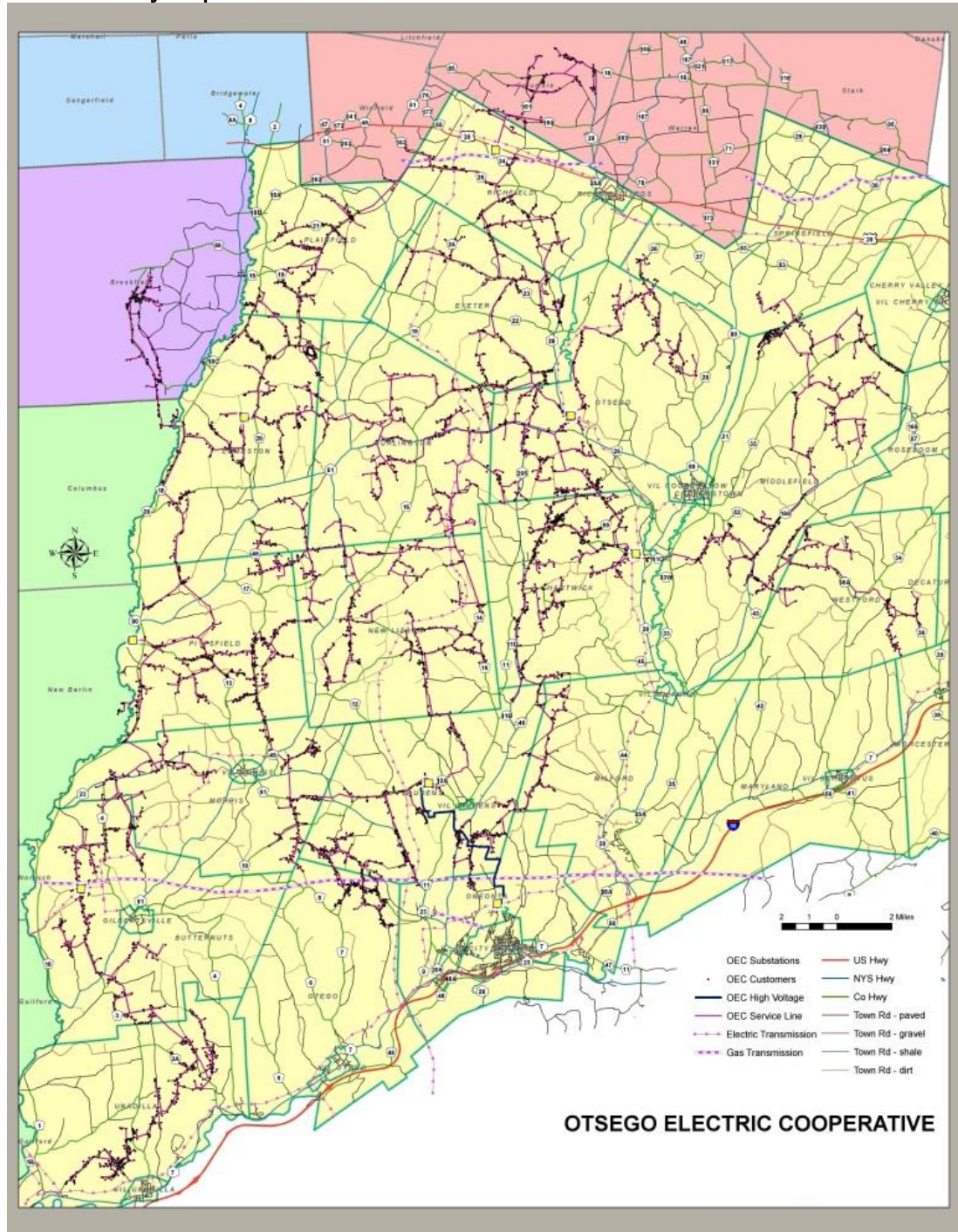
b. New York State Electric & Gas (NYSEG)

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 unlike OEC, 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 is the northeast section of the County and along I-88 just east of Oneonta to the County's southwest edge covering approximately 10-15% of the County.

NYSEG Boundary Map
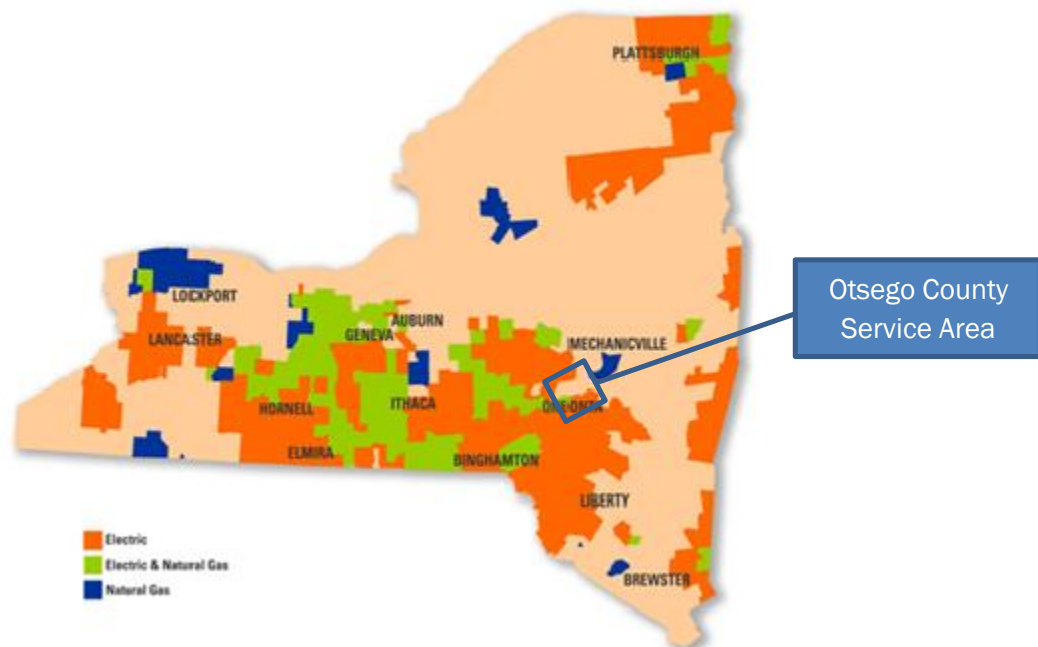
c. National Grid

The last power 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 is the southeast section of the County and along I-88 just east of Oneonta to the County's eastern border and covers approximately 10-15% of the County. 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.

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National Grid Boundary Map

f) OSP Support

The study assumes that the Public Private Partnership (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 County of Otsego IDA should look for partners that have experience deploying and servicing networks in rural areas and can meet the network and broadband requirements. One of these local partners is OEC.   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. Otsego Electric Cooperative (OEC) – Local Power Company/Cooperative

Otsego Electric Cooperative brings a very important potential partnership opportunity to the County of Otsego IDA's broadband deployment. Discussions with OEC's executives have focused on pole use and access, possibly using the neutral area of the power poles thereby reducing or extremely limiting the amount of make ready work, offering up staff and equipment for construction and maintenance and potentially using ground base facilities for equipment. This type of partnership meets OEC's desire to deploy broadband services to its members who are strongly requesting broadband services. OEC has a substantial customer service and maintenance operations organization that can be leveraged to support a fiber network with incremental training and staff. This partnership has the potential to reduce the overall broadband project by 25-35% for both up-front construction costs and the recurring maintenance costs.

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ii. 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 County of Otsego IDA's area.

g) Deployment Costs for Fiber

The study takes full advantage of initial capital cost savings to deploy a fiber network using existing transport fiber networks for the majority of its route. The following costs represent the estimated costs for fiber builds used in the financial section of this study.

Fiber Type	Estimated Cost/Mile
Otsego Electric Cooperative Proposed Fiber	$ 26,000
3rd Party Power Company Fiber (NYSEG, National Grid)	$ 35,000

1. 3rd Party Fiber Lease

Using 3rd Party fiber network providers will shorten time to market and reduce fiber build miles/costs and ongoing maintenance requirements. The costs for third party fiber leases are projected in the operational costs as monthly capacity leases based on bandwidth. The monthly lease rate estimated in the pro forma is $9,521 per 2 Gb Ethernet circuit.

Otsego Electric Cooperative (OEC)

The benefits OEC could bring to the project include lower or no make ready costs, lower construction costs plus lower annual maintenance and pole leasing costs. They also could bring strong local connections to the project.

2. 3rd Party Power Company solutions

The projected costs for 3rd party pole lines is based on historical data and pricing with an uplift to account for the hilly and rugged terrain that increases the amount of make ready work and number of pole replacements.

h) 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

The partners in the project will help reduce these expenses by synergistically lowering the costs for most of these items since they have systems, staff and equipment in place.

i) 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 Main Street 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 of Otsego IDA 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 County of Otsego IDA'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) vs Active Gigabit (AG)

The proposed 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.

3. Passive Optical Network (PON)

Today's technology is able to provide multiple GE networks to business and residential customers. The main technology widely deployed today is the Gigabit PON (GPON) to customers providing 40+ 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.

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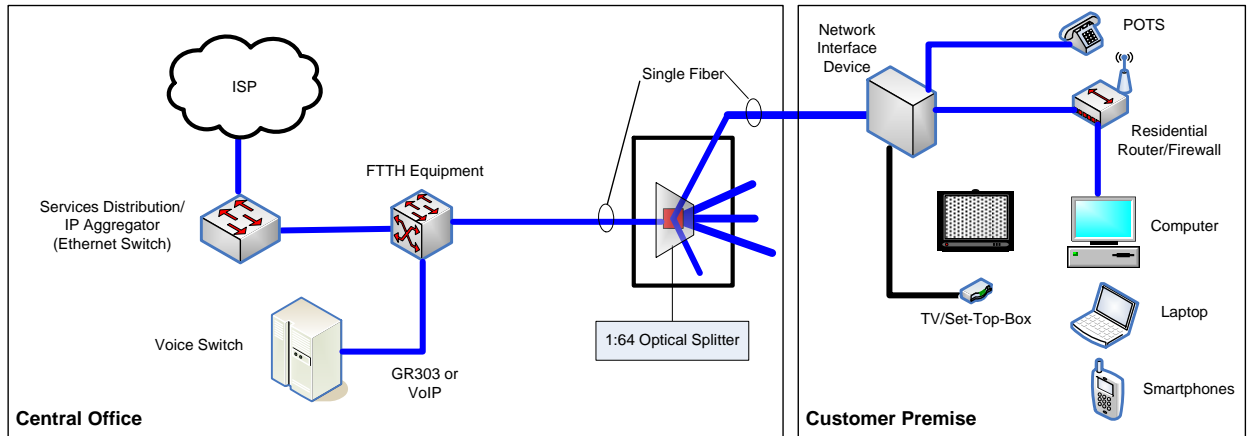
4. Active GE

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 point-to-point (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 a quarter (1/4) 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 Oneonta or Cooperstown as part of the proposed solution and provided costs.

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

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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, Boxie, etc.
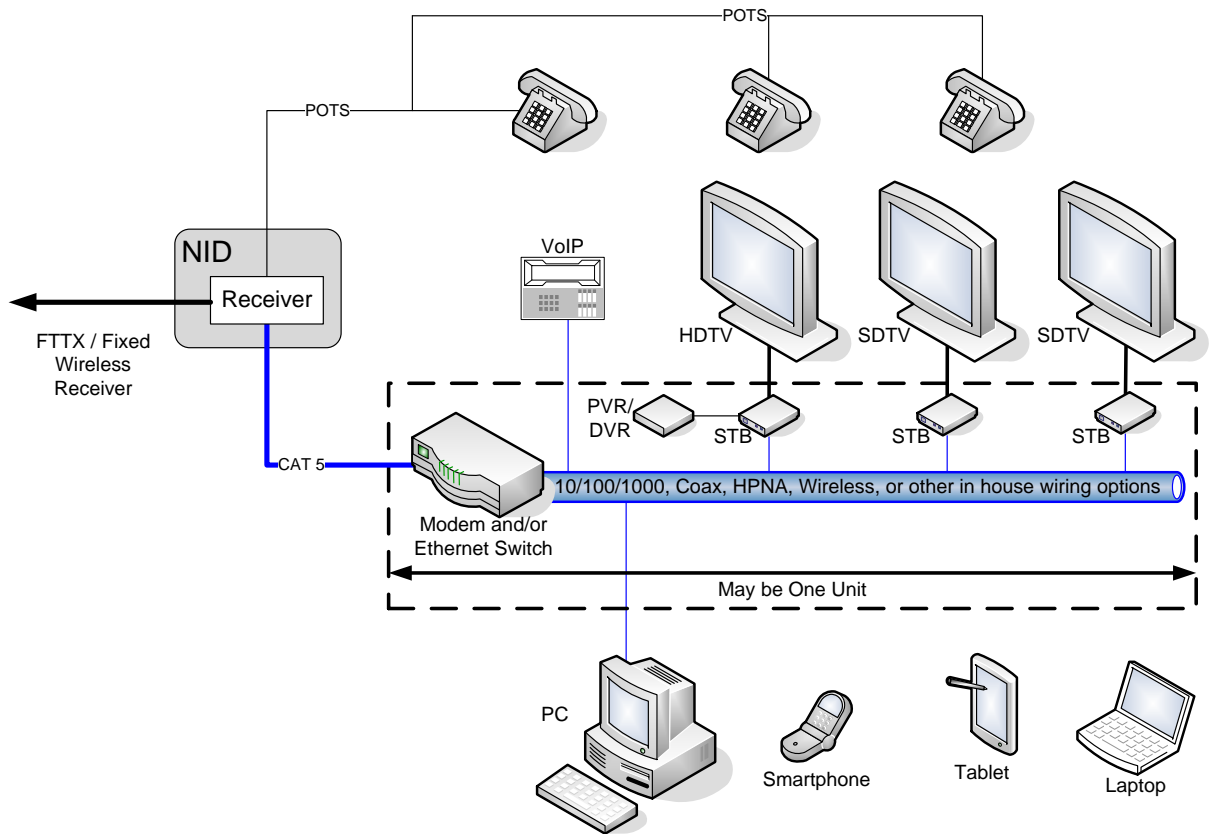
The study anticipates the need to install new wiring and access solutions inside customer premise locations required to take advantage of the fiber or wireless access speeds. Some locations may already have acceptable inside wiring solutions due to the location being served by HughesNET, WildBlue or 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 Gb 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.

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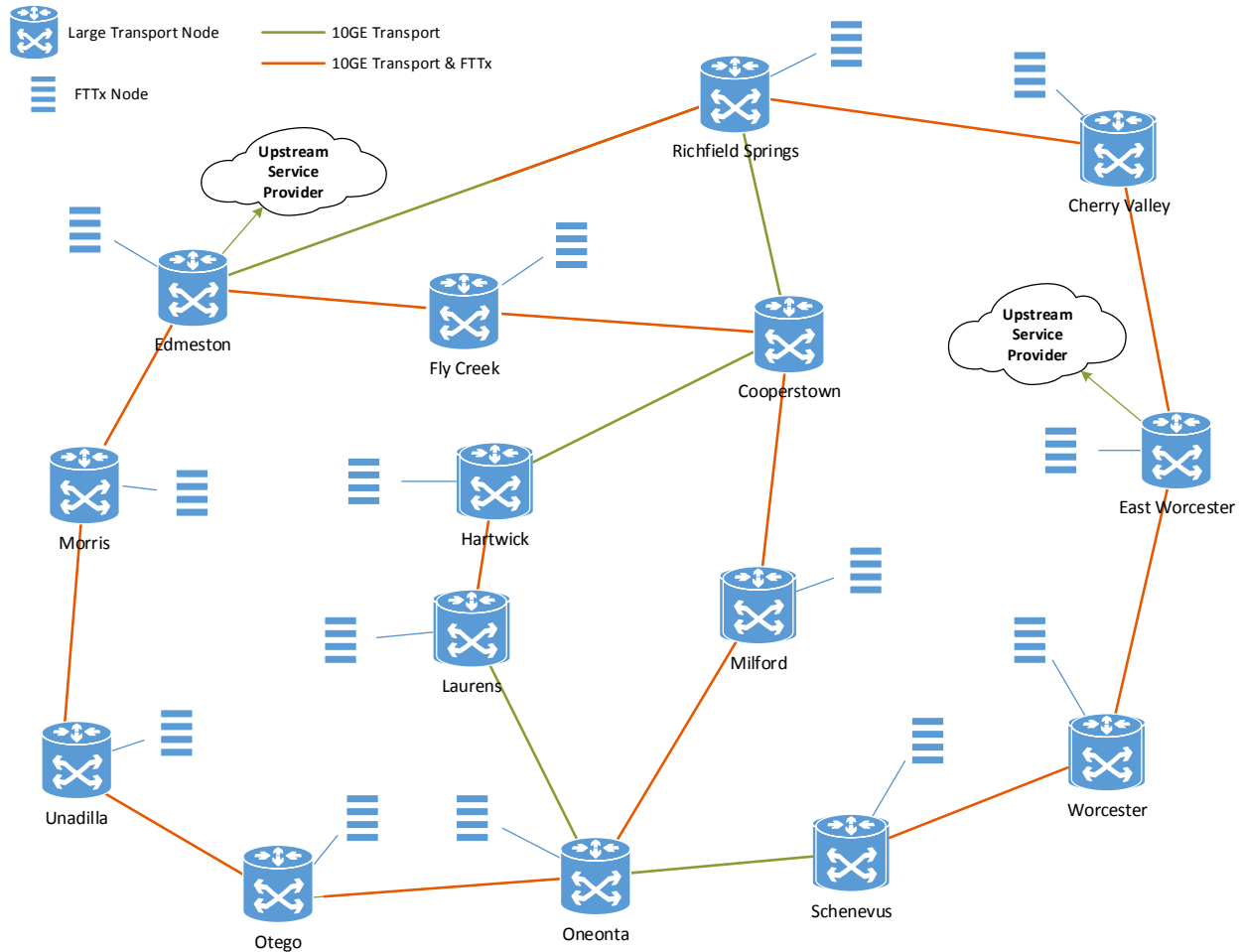
MPLS, which stands for Multi-protocol label switching, is a highly efficient technology that allows for the creation of highly reliable point-to-point and point-to-multipoint services over an Ethernet/IP network. These services include such things as Internet, voice over IP, video and virtual private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

The proposed MPLS transport network consists of 15 sites. The sites are as follows.

- Cherry Valley
- Cooperstown
- East Worcester
- Edmeston
- Fly Creek
- Hartwick
- Laurens
- Milford
- Morris
- Oneonta
- Otego
- Richfield Springs
- Schenevus
- Unadilla
- Worcester

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Of the listed sites, there are two types; large nodes and small nodes. Large nodes consist of more than two 10 GB transport interconnect points. These sites include Cooperstown, East Worcester, Edmeston and Oneonta. These five sites connect the other 10 smaller sites to form a redundant diverse fed 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 two upstream service provider interconnect points. These interconnect points are in Edmeston and East Worcester. The Upstream service provider will host the various services offered to the subscribers in this network.

Also, of the 15 sites, all but Cooperstown is designed to provide services to the FTTH 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 Fiber to the Home (FTTx) is the optimum long-term solution for access, it is also the most costly especially in the most rugged and least densely populated portions of the County. Consequently, the study includes fiber fed wireless broadband towers, to serve customer premises with wireless in locations not located along a proposed fiber routes.

The proposed system would use 15 existing tower locations while building 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. Supported levels are:

Received Power at remote:

>= -60.0 dBmW	~12 Mbps DL / 6 Mbps UL *Max CPE throughput
- 70.0 to -60.0 dBmW	~12 Mbps DL / 6 Mbps UL *Max CPE throughput
-80.0 to -70.0 dBmW	~10 Mbps DL / 5 Mbps UL
-90.0 to -80.0 dBmW	~4-6 Mbps DL / 1-3 Mbps UL

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.

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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.

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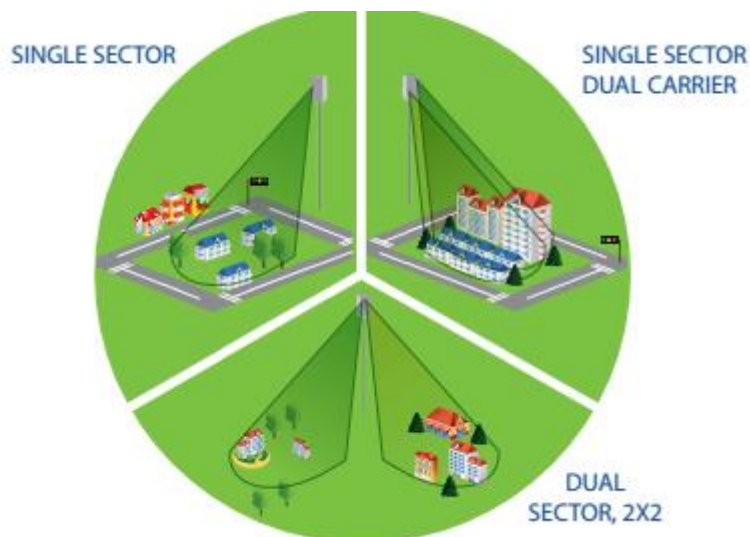
The Base Station system will support the following.

• 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 3 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 first, followed by Ring 2, and finally Ring 3. Capital expenditures are summarized as follows:

Capital Expenditures

Description	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Totals
Wireless Towers	$1,085,252	$1,674,280	$270,563	$0	$0		$3,030,095
Transport Network	$1,361,640	$946,680	$5,600	$0	$0		$2,313,920
Fiber	$2,764,060	$3,280,510	$178,360	$0	$0		$6,222,930
Customer Drops & Customer Premise Equipment							
FTTH	$5,772,475	$5,633,775	$927,100	$0	$0		$12,333,350
Wireless	$768,900	$3,230,700	$470,800	$0	$0		$4,470,400
Startup Costs	$226,245	$0	$0	$0	$0		$226,245
Work Equipment	$25,846	$51,679	$153,218	$168,704	$168,704	$168,704	$736,855
Office Equipment	$3,956	$7,936	$23,523	$25,866	$25,866	$25,866	$113,013
Capitalized Interest	$354,577	$437,763	$59,917	$5,745	$5,745	$5,745	$869,492
Total Capital Investment	$12,362,951	$15,263,323	$2,089,081	$200,315	$200,315	$200,315	$30,316,300

Capital expenditures for customer drops and customer premise equipment continue beyond the initial 3 year construction phase to provide service to new customers. The customer drops and CPE are only incurred if customers subscribe to 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 $850 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.

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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 County of Otsego IDA 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 and Year 1 to provide additional working capital. The accelerated funds are reduced from Year 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	5,271	0	3,657	83	0	0	9,011
Access to Wireless Broadband	2,330	0	8,059	448	0	0	10,837
Total	7,601	0	11,716	531	0	0	19,848
New Customers (Cumulative)							
Access to FTTx	5,271	5,271	8,928	9,011	9,011	9,011	
Access to Wireless Broadband	2,330	2,330	10,389	10,837	10,837	10,837	
Total	7,601	7,601	19,317	19,848	19,848	19,848	
Customer Penetration Estimate	30%	60%	70%	75%	75%	75%	
Projected Customers Subscribing to Broadband and Voice Services:							
FTTx Customers	1,581	3,163	6,250	6,758	6,758	6,758	
Wireless Customers	699	1,398	7,272	8,127	8,128	8,129	
Total	2,280	4,561	13,522	14,885	14,886	14,887	

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 Otsego County towers at a rate of $2,000 per month per tower site.

3rd Party Leased Fiber – The construction plan utilizes existing fiber routes where possible to complete planned fiber optic rings. These 3rd party owned fiber routes have been projected as fiber capacity leases of 2 Gb links connecting fiber routes that will be built. The monthly charge for the fiber capacity leases are $9,521 per 2 Gb link.

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 envelope 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 Public Private Partnership (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. FARR recommends careful consideration of the cooperative model first followed by the not for profit model. Especially compared to partnerships or joint ventures, these structures provide long-term, stable organizational structures that are eligible for RUS loans and grants and other grants, provide the liability protection of corporations, provide tax advantages for members/owners, and provide 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, OEC, a Telecommunications Service Provider, and County of Otsego IDA, 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.

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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 &

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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

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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.

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- *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.

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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 County of Otsego IDA, OEC, Otsego County and a Telecommunications Service Provider. Clearly, other partners may be considered to address specific requirements of the network, however, these three partners should own and operate the network.

Otsego County Electric

Stephen Rinell, CEO, and James Foote, Director of Technology and Member Services expressed interest in seeing broadband deployment in their service territory and in partnering with others to accomplish the goal. They discussed assets that OEC could bring to the project including use of their pole lines for fiber cable installation, a tower for installation of wireless equipment, access to poles for small antennas to extend wireless coverage in difficult areas, connections with land owners for lease/purchase of land for new towers, and their operations and maintenance services and customer operations and billing systems.

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They are also interested in acquiring fiber/circuits for connections between their 7 sub stations. OEC provided CAD data for their pole lines and tower for use in this study.

Otsego 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 the County of Otsego IDA's area.

Project Beneficiaries

During on site meetings in September 2014, 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 Oneonta and Cooperstown, DSL speeds are well below the current FCC 4 MB down / 1 MB up definition of broadband, are not widely available and are costly for the level of service received. For residents outside the 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.

During the discussion with potential partners and community groups, a number of potential assets for construction of the proposed system that can substantially lower the cost of construction and the amount of construction time were identified. In addition, existing customer operations and maintenance staff and customer operations and billing systems can lower operating costs were identified. The project may also stabilize current employment in the County and possibly add new employment opportunities.

Otsego County

Six County representatives, most of which were from the unserved locations in the County, met with FARR staff during September 2014. Of the 6 attendees, 2 of 5 are on the Public Safety and Legal Affairs Committee and 3 of 3 are on the Telecommunications Committee

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were present. Concerns / issues identified included public safety, no/poor cellular voice and data coverage, expensive but limited BB availability that limits ability to work from home, extensive 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. Two new E911 tower locations were identified and are incorporated into the study.

The Census data (Appendix E) shows that the County has declined 1% in population from 2010 to 2013 and has 20% of its population aged 62 and over. If the population centers of Oneonta (with SUNY – Oneonta and Hartwick College) and Cooperstown are 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 strong tourism draws including Cooperstown's Baseball Hall of Fame, the location of I-88 on its southern border, numerous lake homes, hunting homes, summer homes and a rich variety of outdoor activities. All of these visitors place seasonal demands on the telecommunications infrastructure that are unmet with today's network. In addition, as revealed during the on-site meetings in September 2014, while the Census data shows 1,689 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.

County Cities / Population Centers

Eleven city officials, all from unserved areas of the County except for one official from Oneonta, attended the meeting with FARR staff. Concerns/issues identified included no/poor cellular voice and data coverage, high cost of current offerings for less than FCC standard broadband speeds, need for affordable broadband including "shared tenant access" or a lifeline model, no interest from incumbent phone, cellular, cable or WISP providers to build out further from Cooperstown and Oneonta, and the negative impact on K12 education. One individual did get a price to extend their service at a cost of $75,000, which would be shared between 3-4 other potential users. Another individual was quoted $8,000 for extension to his property. Both of these options were rejected due to cost. In general, a large amount of dissatisfaction and pent up demand for high speed broadband was expressed.

County School Districts

Nine school officials representing eight school districts attended the meeting with FARR staff. Access on campus across all of the districts represented was very good – 100 MB to 1 GB plus wireless in all school buildings. Most districts have a 1 to 1 computer initiative in place for their students, however, the lack of broadband in the students' homes severely restricts the effectiveness of the program. Distance learning (DL) programs are becoming more important to the schools for delivering core classes, not just electives. For effective DL the broadband speeds needs to be at least 3MB up and down. Richfield Springs School District investigated a Discovery Education offering that would replace current hardcopy textbooks for science and history with electronic texts with video/audio extensions to incorporate additional, current information. The program could save substantial costs for the school districts and improve the content delivered. Hard copy books can cost $175 per student per year for science and history, while the Discovery program is priced at less than $20 per

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student per year for science and history. If the broadband service at the students' homes improved, Richfield Springs could deploy a local server for content and continue to use their existing 100 MB connection.

County Businesses

Seven representatives attended the meeting with FARR staff. The primary concern of this group is the County's poor competitive position when recruiting new businesses and residents or encouraging existing businesses to grow within the County because of the poor broadband availability in most of the County. They recognize that the County of Otsego IDA will have to have grant funding to accomplish the project due to the rugged terrain and sparse population in the County. They also expressed frustration about the lack of progress in addressing this issue over the past 5-8 years.

County Residents

Ten citizens attended the meeting with FARR staff. Concerns included no/poor cellular coverage, limited / expensive broadband coverage, high cost to extend lines ($19,200 for a 6,000 foot extension) and a 2 month wait for extension of a copper voice line, and the difficulty of running a small businesses or working from home. A large amount of pent up demand was noted in this group. Campground owner notes that during tourist season, all of his customers bring multiple electronic devices and expect to have access to broadband and complain when they can't get it. One person owns an auto repair shop and performs inspections. The state requires him to update software on the inspection systems so he pays $300 per month for phone/TV/satellite BB/cell service and even with the satellite BB service it can take hours to update his inspection system.

County Emergency Services

FARR and COIDA staff met with a County Representative and their E911 consultant. The consultant did not see any operational or technical issues that would prevent installation of 3.5 GHz wireless equipment at their tower locations. The County is in the process of upgrading the E911 communication systems so this feasibility study does not include any E911 functionality.

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	Grant	$150M statewide in 2014		ESD / REDC	2014 program, 2015 details not announced

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2015	Loan	$34M		RUS Broadband Loan	Pending update to 7 CFR 1738
2015	Grant	$10M		RUS Gigabit Network Pilot Program	Pending CFR update by RUS
2015	Grant	$500M for 2015-2018 proposed		ESD / New NY Broadband Fund	Pending final legislative
2015	Grant	$3M		RUS Community Connect Grant	Pending FY2015 funding legislation
2016	Loan	$34M		RUS Broadband Loan	Pending update to 7 CFR 1738
2016	Grant	$10M		RUS Gigabit Network Pilot Program	Pending CFR update by RUS
2016	Grant	$500M for 2015-2018 proposed		ESD / New NY Broadband Fund	Pending final legislative action
2017	Loan	$34M		RUS Broadband Loan	Pending update to 7 CFR 1738
2017	Grant	$10M		RUS Gigabit Network Pilot Program	Pending CFR update by RUS
2017	Grant	$500M for 2015-2018 proposed		ESD / New NY Broadband Fund	Pending final legislative action

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

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- o Does not overlap current or pending RUS borrowers or grantees

- o Loan award based on economic feasibility
  - Minimum Equity Requirement – 10% -but may be higher

- o 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

- o 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

- o 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.

Rural Gigabit Network Pilot Program

http://www.law.cornell.edu/uscode/text/7/950bb-2

It will make $10 million available for each fiscal year from 2014 through 2018 for a total of $50 million. Eligible companies will be able to get access to a mix of grants, loans or loan guarantees to bring "ultra-high" broadband to rural cities and towns.

One of the requirements telephone companies have to meet is that any proposed build out has to be in rural areas where ultra-high speed service is not already available and it has to be completed within three years of getting the funding.

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

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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. Funding Resources

E. Census Data

F. Census Block Data for FCC Grant Program

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