Warren County North Carolina

2018

Broadband Study and Design

Presented by:

RiverStreet NETWORKS

1400 River St, Wilkesboro, NC 28697

www.myriverstreet.net

6/4/2018

RiverStreet NETWORKS

INDEX

Section 1

About RiverStreet Network

Wilkes Communications, Inc., d.b.a. RiverStreet Networks, has a storied history, which began when Wilkes Telephone Membership Corporation filed its Certificate of Incorporation on August 24, 1951. For 67 years, the Membership Corporation has provided communication services to Wilkes County. Over the years, this family of businesses have grown and changed. However, the way it does business has not. Owned by its members, Wilkes Communications is fully committed to providing the members and customers with the best service possible by being able to make one call for all customers communications needs.

What started as a group of local Wilkes County citizens in 1949 petitioning to Central Telephone Company for service has evolved into a communications company offering your traditional home telephone, plus High Speed Internet and Digital TV, over a Fiber-to-the-Premise network. In addition, Wilkes Communications offers security and surveillance services as well as a full lineup of business solutions. On April 13, 1951, twenty-three members of the community met to hear representatives of the North Carolina and The Federal REA speak about the formation of the rural telephone cooperative. This meeting became the beginning as life was breathed into the organization.

Although the telecommunications industry has been undergoing and will continue to undergo tremendous changes, Wilkes Communications is dedicated to providing customers and members with the latest in technological advancements and services available today.

Being part of the community is more than just providing service to the people who live there. Wilkes Communications is committed to supporting the people and organizations that aim to make Wilkes County a strong place to live and work. In an effort to ensure the future is as strong as the past, Wilkes Communications established a scholarship program in Wilkes County. Since the creation of this program in 2002, the organization has awarded over $230,000 to local high school seniors.

Wilkes Communications has expanded its service offerings beyond the boundaries of the core market in Wilkes County. In doing so, Wilkes Communications created RiverStreet Networks, a wholly-owned subsidiary, to provide its leading-edge services to other rural areas where families and businesses can enjoy the benefits of a fiber-to-the-home network. Being built on rural principles, Wilkes Communications pride itself in continuing that tradition.

In 2016 Wilkes Communications purchased three small properties, Saluda Mountain Telephone, Service Telephone, and Barnardsville Telephone from TDS. These companies were for-profit, Independent Local Exchange Companies (ILEC). This year, through other acquisitions, the

company will incorporate two other for-profit companies into the organization, Ellerbe Telephone Company in Ellerbe, NC, and Peoples Telephone Company in Gretna, VA. In July of 2018, Wilkes Communications, Inc. will also break the mold in the state and merge its cooperative with one of the other eight independent telephone cooperatives in North Carolina. This merger with TriCounty Telephone Membership Corporation, d.b.a. TriCounty Broadband, in rural Eastern North Carolina, solidifies the beginning of change in our state. The combination of these two cooperatives truly gives Wilkes Communications a statewide presence and a mountain to the coast membership model.

Moving to one brand, Wilkes Telephone Membership Corporation / Wilkes Communications, Barnardsville Telephone Company, Service Telephone Company, Saluda Mountain Telephone Company, Ellerbe Telephone Company, TriCounty Telephone Membership Corporation / TriCounty Broadband, and Peoples Telephone Company all become RiverStreet Networks. The overall mission is "To provide excellence in customer service while adding value to the customer and serving the unserved".

Capabilities, Qualifications, and Similar Projects

RiverStreet Networks has been providing Fiber-to-the-Home services since 2005 via an all Active fiber network in its core market in Wilkes County, NC. During the acquisition of three former TDS properties, the company also dedicated itself to overbuilding these antiquated copper-based networks to provide 1 Gbps services to each respective community. These networks are in the process of being migrated to fiber with Saluda Mountain occurring 2017- 2019, Barnardsville in 2018-2020, and Service in 2019-2021. Concurrently, RiverStreet has been constructing a greenfield Fiber-to-the-Home network in Stokes County, NC with hopes of passing at least 5,000 customers by 2018. All of these projects, including the original overbuild in Wilkes, were predicated upon the need of access to high-speed Internet services in rural North Carolina.

Wilkes County contains 754 square miles of land mass, and RiverStreet Networks provides services in 562 of those square miles. With only 3.74 customers per route mile, coupled with construction and material costs, RiverStreet - Wilkes focused not on huge profit margins, but instead on providing state-of-the-art services at affordable prices to the communities. The project began in 2005 and was completed in December 2014 -- almost 1 year ahead of schedule. This project included overbuilding and cutting all 8,000+ accounts over to a technology rarely seen in urban areas and far less in rural America. Being one of the first companies in the United States to complete such a feat, Wilkes Communications was presented with awards and gained national recognition throughout the telecommunications industry as being pioneers and trendsetters. All

networks referenced above are active fiber networks and are wholly owned by Wilkes Communications, Inc. and RiverStreet Networks.

In 2011 a simultaneous Fiber-to-the-Home project began at the RiverStreet-TriCounty property in Eastern North Carolina. A build of 355+ miles of fiber was installed to pass all served by legacy copper and coax networks. By 2016 all member/customers were passed and over 1,000 member/customers were attached and using service. Today more than 1825+ member/customers are attached to the network and using broadband service over Fiber.

Governing Bodies and Industry Affiliates

RiverStreet Networks is in good standing with the following (not an exhaustive list): Federal Communications Commission, North Carolina Public Utilities Commission, USDA, RUS, NECA, NTCA, NLRB, and NCDOL. Further proof can be provided upon request, under oath, if required.

Subscriber Statistics (December 2018)

21,638 Accounts
23,658 Access Lines (POTS)
16,116 Internet Subscribers
5,000 Digital TV Subscribers
1,408 Security/Monitoring Accounts
141 Employees

References:

John Yates, County Manager - Wilkes County
jyates@wilkescounty.net - 336-651-7300
110 West North Street, Wilkesboro, NC 28697

Julie F. Triplett, CTO - Wilkes County Schools
tripletj@wilkes.k12.nc.us - 336-667-1121
613 Cherry Street, North Wilkesboro, NC 28659

Business and Teaming Relationships

RiverStreet Networks benefits from its parent company's established relationships with MCNC, ERC, AccessOn, Visions West, Spirit/PalmettoNet, Level3, Verizon, AT&T, Windstream, Charter/TWC, CenturyLink, as well as the 7 other telephone cooperatives and 25 Electric Membership Cooperatives in North Carolina.

Executive Team and Project Personnel

Eric S. Cramer -- President and Chief Executive Officer

- Jody R. Call – Chief Technical Officer
- Zackary R. Church – Outside Plant Engineering Supervisor
- Gregory S. Coltrain – Vice President of Business Development
- Seth E. Hartman – Outside Plant Engineer
- Kimberley H. Johnson – Chief Financial Officer
- Amanda P. Perry – Vice President of Sales and Marketing
- Jody M. Souther – Vice President of Engineering

** Resumes are contained in Section 14

Services Provided

RiverStreet Networks will provide Internet access, voice, home security/monitoring solutions, lifeline, Metro-E, Ethernet Transport Services for wireless providers, technical support, business systems, and IT services. Digital TV may be provided, and is dependent upon consumer interest. Typical data rates will be 25/3 Mbps, 50/10 Mbps, 100/10 Mbps, 250/25 Mbps, and 1000/100 Mbps. Latency is typically < 2 milliseconds in the core network (layer 2 and 3), while latency to the Internet widely varies depending upon the hosting site(s).

Community Involvement and Presence

RiverStreet Networks gives back to the communities served by having a presence on several local and regional boards, volunteerism, leadership initiatives, event sponsorships, charitable contributions, and scholarship awards. These are just a few examples of how the company gives back and stays involved in the communities served. The companies actively support United Way, various county and municipal economic development initiatives, Relay for Life, March of Dimes, youth philanthropy and leadership, educational partnerships with local schools and colleges, poverty awareness and assistance, hunger assistance, chamber of commerce sponsorship/involvement, and collaboration with anchor institutions.

Introduction and Background Research

1. Optical fibers are made of extremely pure optical glass. We think of a glass window as transparent, but the thicker the glass gets, the less transparent it becomes due to impurities in the glass. However, the glass in an optical fiber has far fewer impurities than window-pane glass.[1] Using this transport technology of optical fiber cable, enables light waves to travel many miles in micro seconds.

Broadband is defined as – a high-capacity transmission technique using a wide range of frequencies, which enables a large number of messages to be communicated simultaneously.

Using Fiber for transport, Broadband can become available in homes and businesses connecting machines and people to the Internet Network at lightning fast speeds. This breaks down the barriers of communications and offers homes and businesses full access to the information they need to be about their daily lives in the world of technology. We believe broadband service is a human right and without access to affordable quality Fiber Broadband Service people will be left behind.

2. The Federal Communications Commission (FCC) has defined Broadband service as a minimum of 25 Mbps download and 3 Mbps upload in the United States.[2] It is the opinion of RiverStreet Networks that Broadband service (1) should be made available to all citizens for a reasonable price, (2) is an economic development tool, (3) requires a minimum speed of 25/3 in order to provide sufficient residential broadband service, and (4) will not stop in compounded growth as the advancement of Broadband based software and technologies continue to hit the market. Because of this increased appetite by the industry as a whole we feel fiber-based networks to the premise (home or business) are paramount in order to support the next 50 years of communications growth. Warren County must have such a broadband network in order to compete for business and support residential growth in the county.

3. As the result of several on-site meetings hosted by Warren County manager, Robert Davie, Warren County entered into an agreement for RiverStreet Networks to provide a Broadband Study and Design to determine costs, materials, and timelines associated with installing a scalable, Active-Ethernet, Fiber-to-the-Home network, or Active-Ethernet Fiber-to-the-Home and Hybrid Fixed Wireless network for the County of Warren in North Carolina. Because of the meetings between Warren County Government, committees, and others, the following was determined:

A. Broadband enhancements are a must have in Warren County.
B. Local leadership remains concerned about the lack of sufficient broadband service in the county and the impact this has on the local economy.
C. A cost agreement of $30,000 for the study was proposed by RiverStreet Networks.
D. The agreement was delivered November 6th, 2017.
E. The delivery deadline for the feasibility study was March 31st, 2018.

[1] https://computer.howstuffworks.com/fiber-optic5.htm
[2] https://www.fcc.gov/reports-research/reports/broadband-progress-reports/2018-broadband-deployment-report

4. Warren County currently has the following communications service providers:

    1. Wireline Providers
        - CenturyLink - voice and low-speed DSL services
        - Spectrum – voice, high-speed cable data service, and TV

    2. Satellite Providers
        - Dish/DirecTV - TV services
        - HughesNet - Data Services
        - Viasat - Data Services

5. Lack of access to modern and scalable broadband data rates has led Warren County to seek opportunities with other service providers. CenturyLink has a copper-based network covering the county, which has been in service for a considerable number of years and does not have substantial viability to provide sufficient broadband service for the county.

6. Spectrum serves the three main townships of Warrenton, Norlina, and Macon and a small pocket community at Lake Gaston in the northeast quadrant of the county. There is very limited access to broadband in the remainder of the county.

7. Other infrastructure in the county includes Duke Power and Halifax Electric Membership Corporation.

8. There is an established Indian tribe in the southeastern corridor of Warren County, The Haliwa Saponi Tribe. Although the Tribe is not nationally recognized, they are state recognized by North Carolina and hold membership on the North Carolina Commission of Indian Affairs. Haliwa is derived from the two counties of Halifax and Warren. These two counties are their ancestral homelands dating back to the 1730s. They re-organized and established local government in 1953 and in 1965 were recognized by North Carolina as an official tribe. The name Saponi was added in 1979 to the tribe as a reflection of their descent from the historical Saponi people, part of the large Siouan languages family. There are currently 3,800 enrolled members in the tribe. [3]

[3] Information obtained from Wikipedia, https://en.wikipedia.org/wiki/Haliwa-Saponi

Section 2

North Carolina Study Area

https://www.ncpedia.org/geography/warren

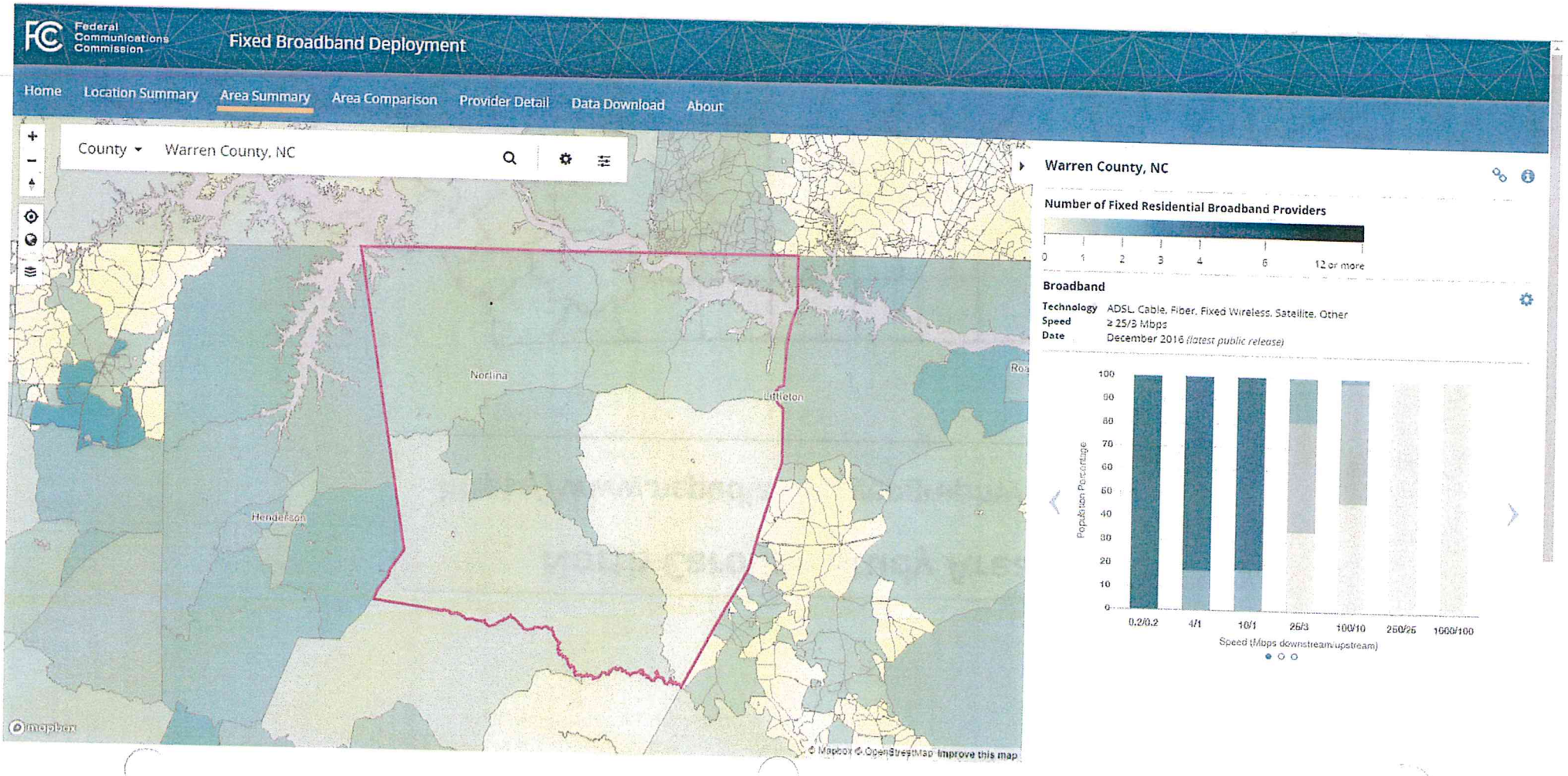
Warren County, North Carolina

Area Summary

2016 Fixed Broadband Deployment

https://broadbandmap.fcc.gov

The FCC 2016 broadband map data below reflects the speeds available in the Warren County Study Area.



Provider Coverage

2016 Fixed Broadband Deployment

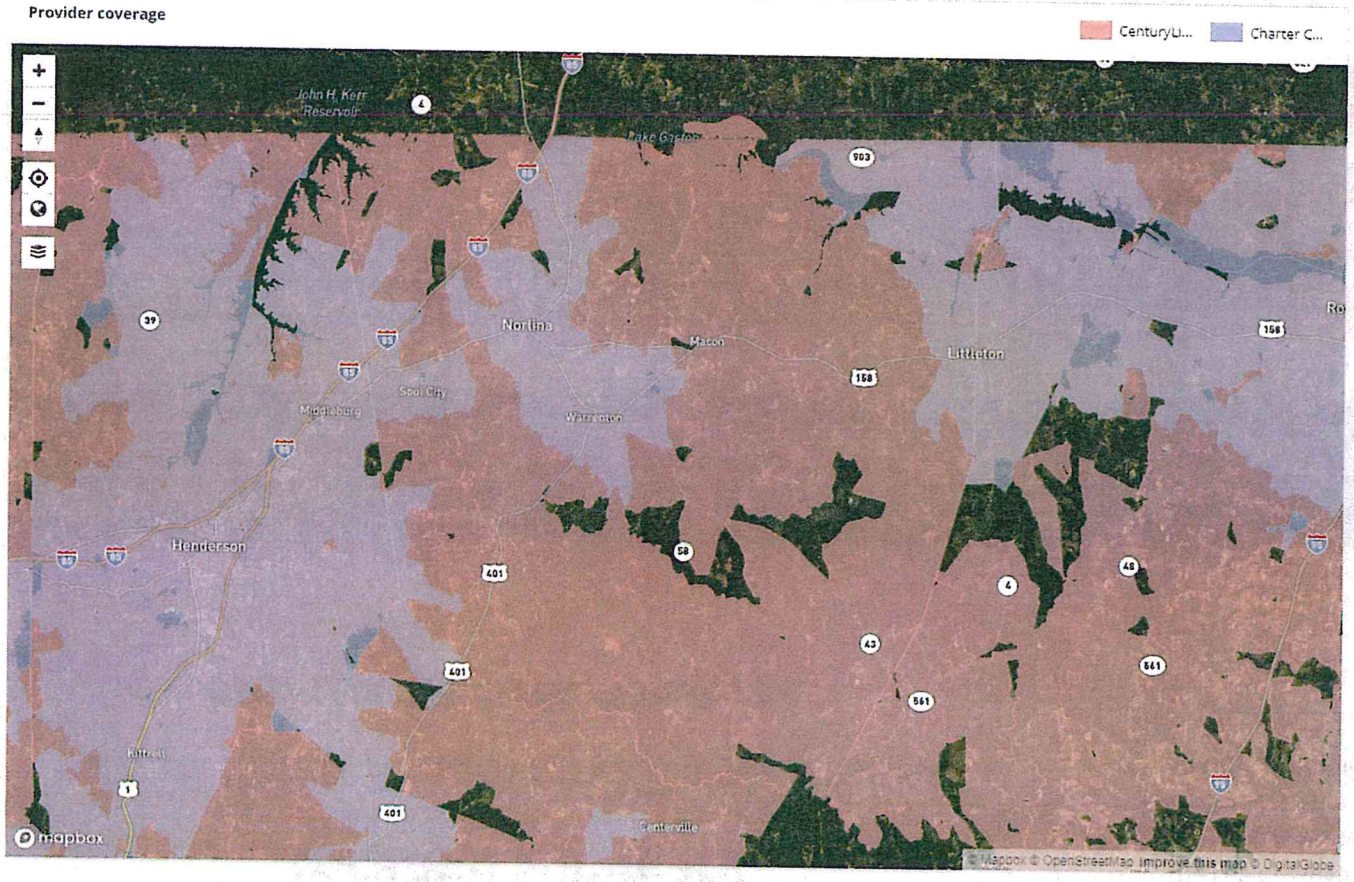
https://broadbandmap.fcc.gov

The FCC 2016 broadband map data below shows providers and overlap in the study area as well as the percentage of coverage.

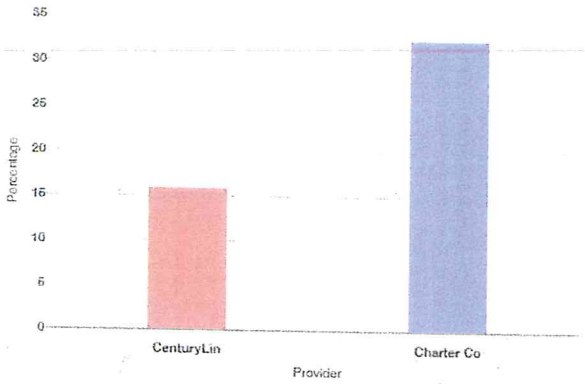
Provider coverage overlap and population coverage

Date December 2016 *(latest public release)*

Provider coverage



Percentage of the pop. covered by selected provider(s)



Percent of each provider's broadband footprint with each speed based on technology

Date December 2016 *(latest public release)*

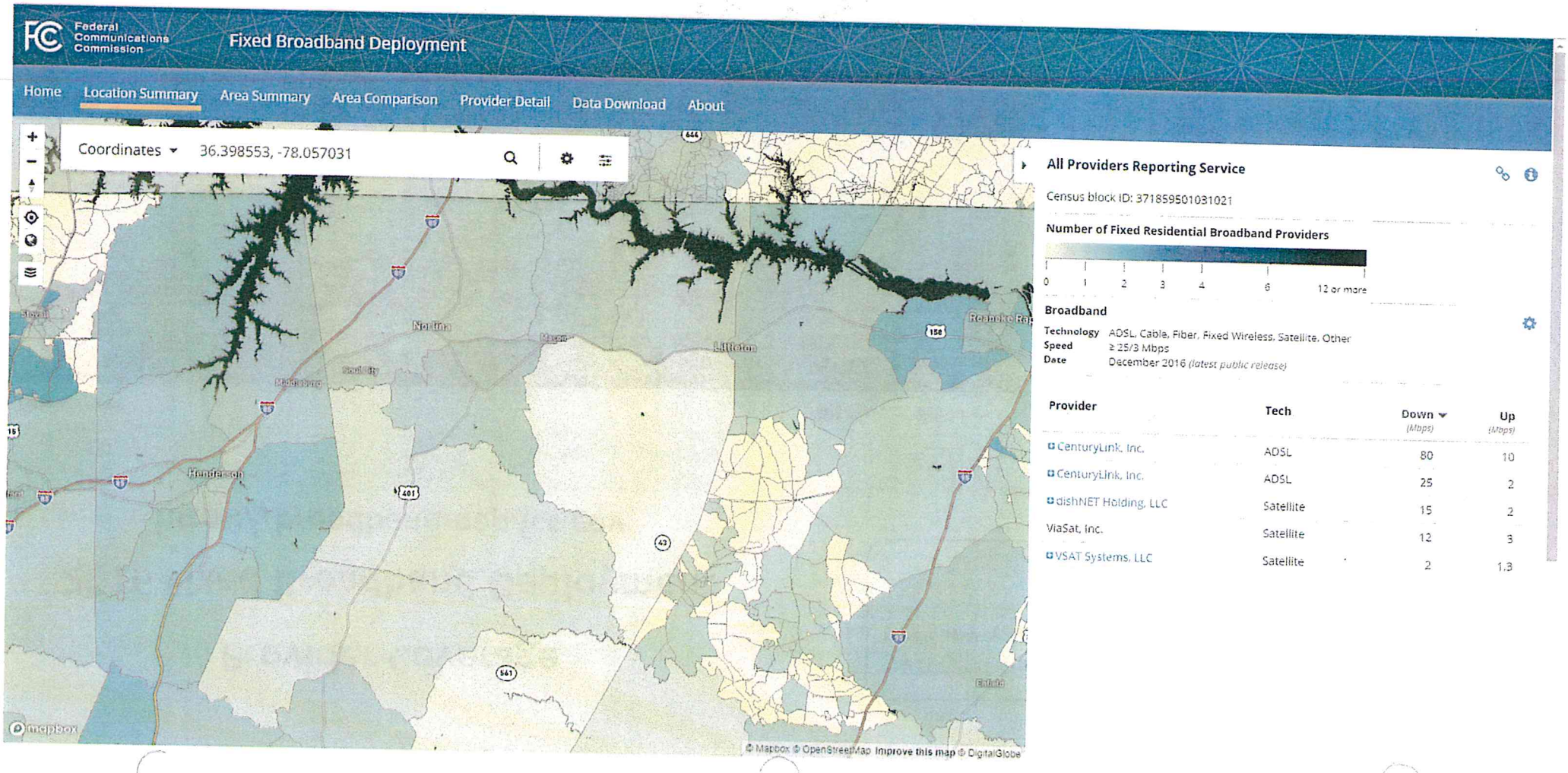
Speed: Download | Upload

Location Summary

2016 Fixed Broadband Deployment

https://broadbandmap.fcc.gov

The FCC broadband map data below from 2016 reflects little competition in Warren County with speeds reflecting less than 100 Mb. Note the speeds listed are advertised speeds. The provider only has to be able to provide the service to one person in order to advertise higher speeds.



Section 3

INTERNET SERVICE PROVIDERS IN WARRENTON, NORTH CAROLINA

Only showing providers serving 27589

Enter your zip code | Search

Advertiser Disclosure

Residential (5) | Business (6) | Mobile (3)

DSL	ZIP COVERAGE	PRICING FOR 10 MBPS	SETUP SERVICE
CenturyLink	96.4%	$45.00	(888) 450-4052

CABLE	ZIP COVERAGE	PRICING FOR 100 MBPS	SETUP SERVICE
Spectrum	44.8%	$44.99	(855) 371-9049

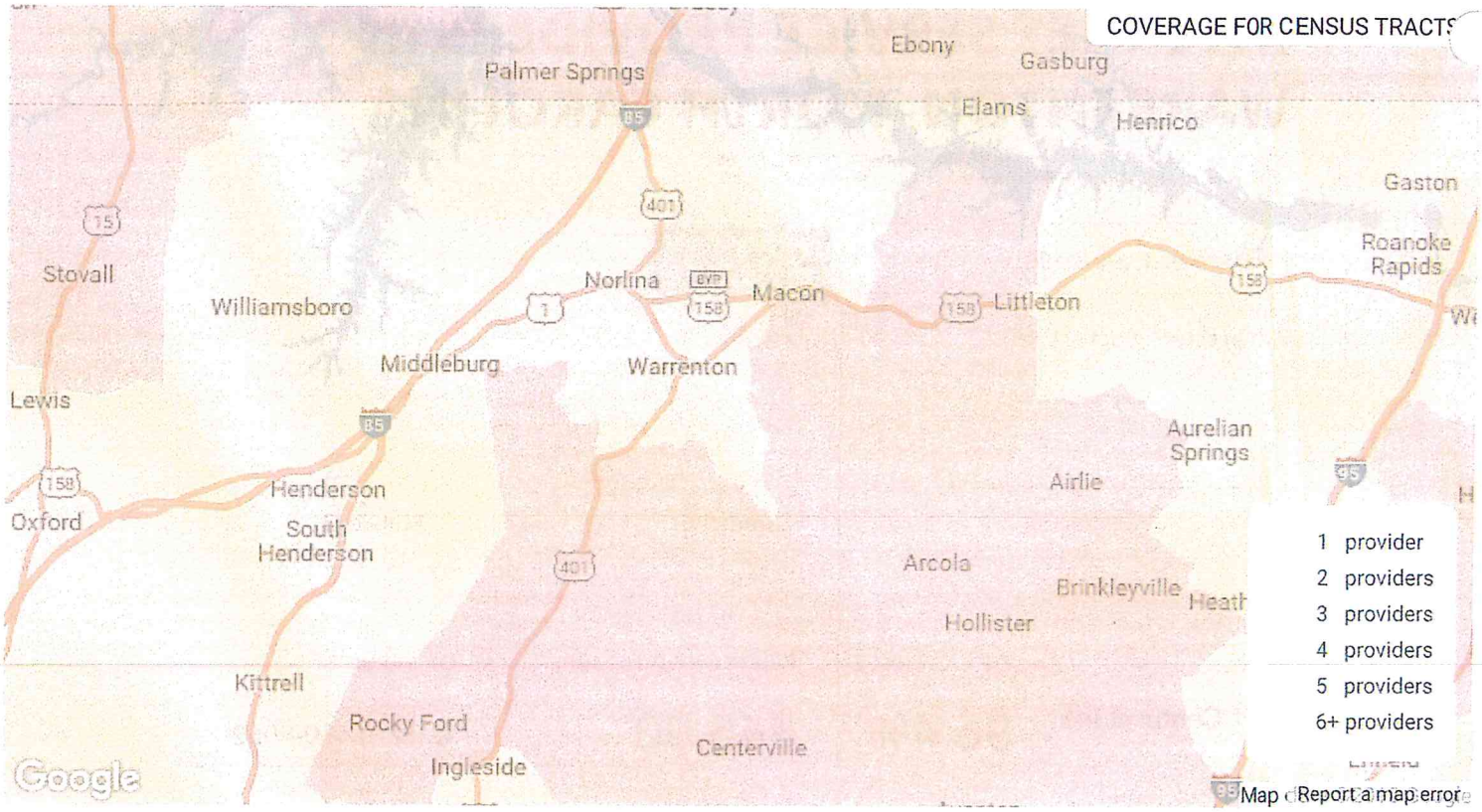
DSL	ZIP COVERAGE	PRICING FOR 25 MBPS	SETUP SERVICE
windstream	2.7%	$50.00	(877) 828-8759

SATELLITE INTERNET PROVIDERS

SATELLITE	ZIP COVERAGE	PRICING	SETUP SERVICE
HughesNet	100.0%	$49.99	(888) 387-7910

SATELLITE	ZIP COVERAGE	PRICING	SETUP SERVICE
Viasat | exede	100.0%	$50.00	(877) 255-5702

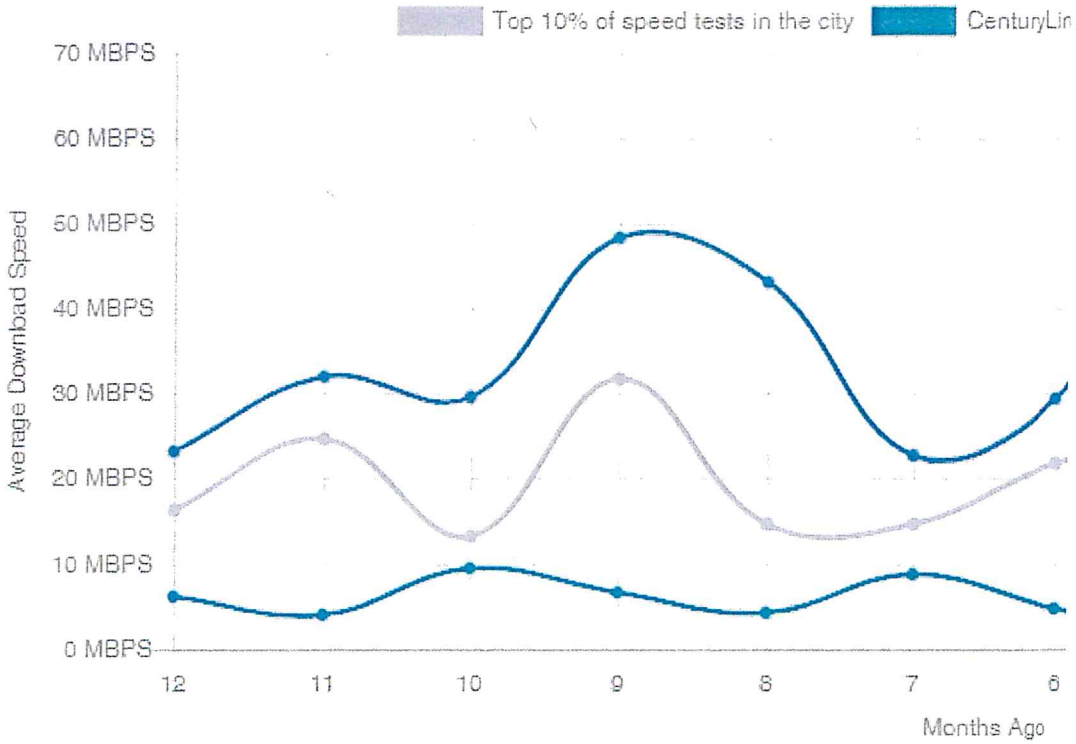
INTERNET PROVIDER COMPETITION MAP



Residential Competition Map | Business Competition Map | FAQ

DOWNLOAD SPEEDS IN WARRENTON

The average download speed in Warrenton is 19.04 Mbps. This is 72.5% slower than the average in North Carolina and 70.9% slower than the national average.



This analysis is based on 1,116 speed tests from IP verified users who took speed tests from an IP address in Warrenton between March 2017 and February 2018. National statistics are calculated across 171,410,994 over the same time range.

RESIDENTIAL INTERNET PROVIDERS

These companies provide residential internet service in zip 27589.

#	Provider	Avg. Download Speed	Cable	DSL	Fiber	Fixed Wireless	Other
1	CenturyLink	4.6 mbps	-	96.4%	-	-	-
2	Charter Spectrum	39.9 mbps	44.8%	-	-	-	-
3	Windstream	-	-	2.7%	-	-	-
4	HughesNet	-	-	-	-	-	100.0%

#	Provider	Avg. Download Speed	Cable	DSL	Fiber	Fixed Wireless	Other
5	Exede Internet	-	-	-	-	-	100.0%

BUSINESS INTERNET PROVIDERS

These companies provide business connectivity options in zip 27589.

#	Provider	Avg. Download Speed	Cable	DSL	Fiber	Fixed Wireless	Other
6	CenturyLink Business	4.6 mbps	-	100.0%	-	-	-
7	Spectrum Business	39.9 mbps	15.6%	-	-	-	-
8	Windstream Business	-	-	0.5%	-	-	-
9	MCNC	-	-	-	0.1%	-	-

WARRENTON, NC BROADBAND STATS

 # OF CONSUMERS WITH 1 OR FEWER WIRED INTERNET OPTIONS AVAILABLE TO THEM

4,000 People

Or 56.5% of consumers in Warrenton

Wireless based services may be an available as well, but often require clear line of sight to a tower. This data is calculated from FCC datasets which providers are legally required to supply twice a year. We further validate this data for accuracy.

There are 9 internet providers in Warrenton with 5 of those offering residential service.

Warrenton is the 590th most connected city in North Carolina ahead of Macon.

There are 6 companies offering business internet services in Warrenton.

No one in Warren County has access to a fiber optic broadband connection.

91.2% of North Carolinians have access to 100mbps or faster broadband.

There are 168 internet providers in all of North Carolina.

Almost 94% of consumers in North Carolina have access to a wired connection with true broadband speeds faster than 25mbps.

Approximately 400 people in Warren County don't have access to any wired internet.

See all North Carolina stats

PUBLICLY FUNDED INTERNET ACCESS

In Warrenton we've found one location that offers publicly funded internet access points. These locations may offer free internet to the public on a schedule. Because schedules vary we recommend contacting the institution ahead of time.

Warren County Memorial Library
119 South Front Street
Warrenton, NC 27589

SHARE THESE RESULTS

COPY LINK TO CLIPBOARD

https://broadbandnow.com/North-Carolina/Warrenton

COMPARE NEARBY

Norlina, Macon, Manson, Bracey, Littleton.

Warrenton, NC has a total of 9 provider networks: 1 cable provider, 2 DSL providers, 1 fiber provider, 3 mobile broadband providers, 2 satellite providers.

Last Updated on 3/25/2018.

Section 4

Expectations

1. Warren County Government requested a study to determine the estimated cost to build an extensive fiber network across all of Warren County. During the discussions with RiverStreet, Warren County manager Robert Davie requested RiverStreet design a complete county wide fiber solution. While developing the study it t was determined, consideration should be given for multiple options to obtain a short-term plan in case an all-fiber build wasn't immediately financially feasible. Such a plan could bridge the gap offering alternative solutions to gain faster speeds of Internet across the county until an all-fiber network could be realized.

2. RiverStreet reached out to a wireless consulting firm, Vantage Point Solutions, to perform a comprehensive wireless study for the benefit of this project. The study was to include available FCC wireless spectrum, topography, elevation, and factoring in the available vertical assets in the county based on RiverStreet Networks and Vantage Point Solutions research. The study is found later in this document in **Section 13.**

Considerations

1. RiverStreet Networks' engineering and design methods are based on the USDA's Rural Utilities Service (RUS) stringent standards. This equates to a network being built with superior materials to RUS specifications to ensure a reliable and scalable network infrastructure for decades to come.

2. Per http://rd.usda.gov, "The Telecommunications Program improves the quality of life in rural America by providing capital for the deployment of rural telecommunications infrastructure. USDA Rural Development is committed to ensuring that rural areas have access to affordable, reliable, advanced telecommunications services comparable to those available throughout the rest of the United States. With this access, rural America will see improved educational opportunities, health care, safety and security and ultimately, higher employment."

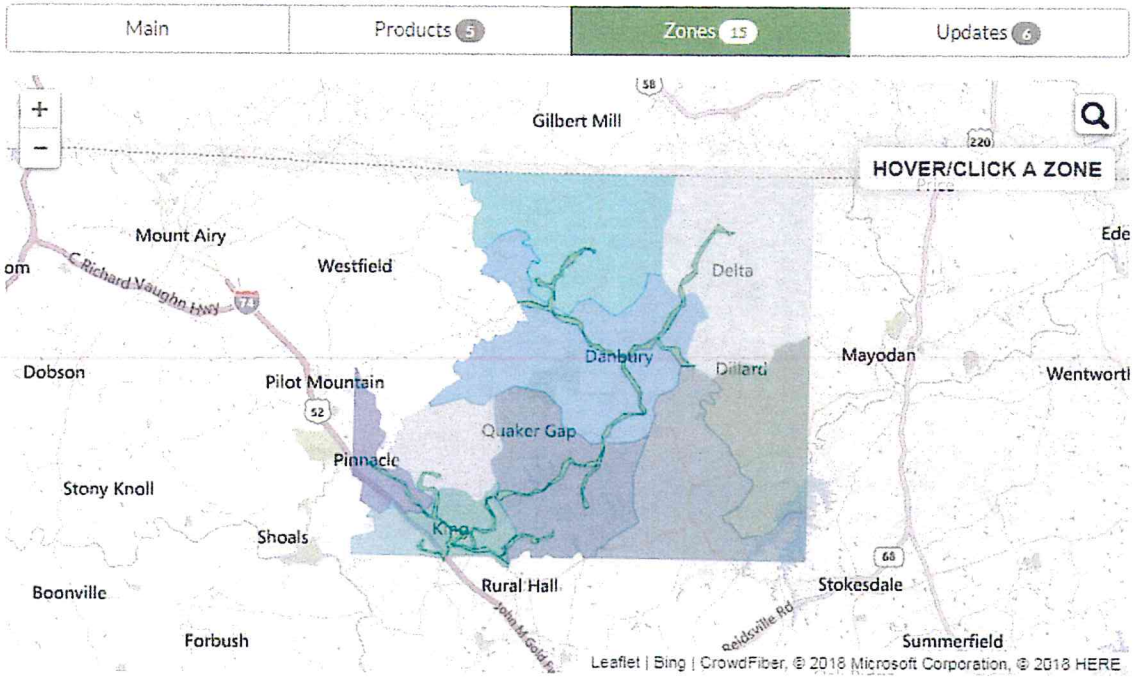
3. Consideration to lease existing fiber infrastructure in the county was given. We approached the incumbent provider in the area (CenturyLink) to secure a formal fiber lease quote and were informed they do not lease dark fiber.

4. General Specifications
    - A. Road mileage within Warren County - 873.9 miles.
    - B. Miles of fiber-optic cable to install - 997.2 miles.
    - C. Average fiber drop to each residence - 500 feet.
    - D. Number of Structures -15,133.
    - E. Type of fiber deployment - Active Gigabit Ethernet.
    - F. Service Delivery Locations - Combination of (6) roadside/remote cabinets and (6) precast concrete buildings.
    - G. Construction - Combination of Wilkes | RiverStreet personnel and qualified contractors.
    - H. Option of a hybrid fixed-wireless delivery utilizing a combination of (17) existing towers, water tanks, and erection of new towers.

RiverStreet NETWORKS
a tradename of Wilkes Communications, Inc.

https://join.buildriverstreet.com

Stokes County, NC



Enter Your Street Address

Apartment/Suite #

Enter your ZIP Code

Residential Business

Search for my Address

4 Zones In Service

11 Zones In Pre-Registration

351 Backers Registered

286

Zones In Service

Areas where service is currently available.

RiverStreet Stokes Serving Area	No goal required!
Barnardsville Service Area	No goal required!
Saluda Mountain Service Area	No goal required!
Fair Bluff Service Serving Area	No goal required!

Warren County Crowd Fiber Option

https://join.buildriverstreet.com

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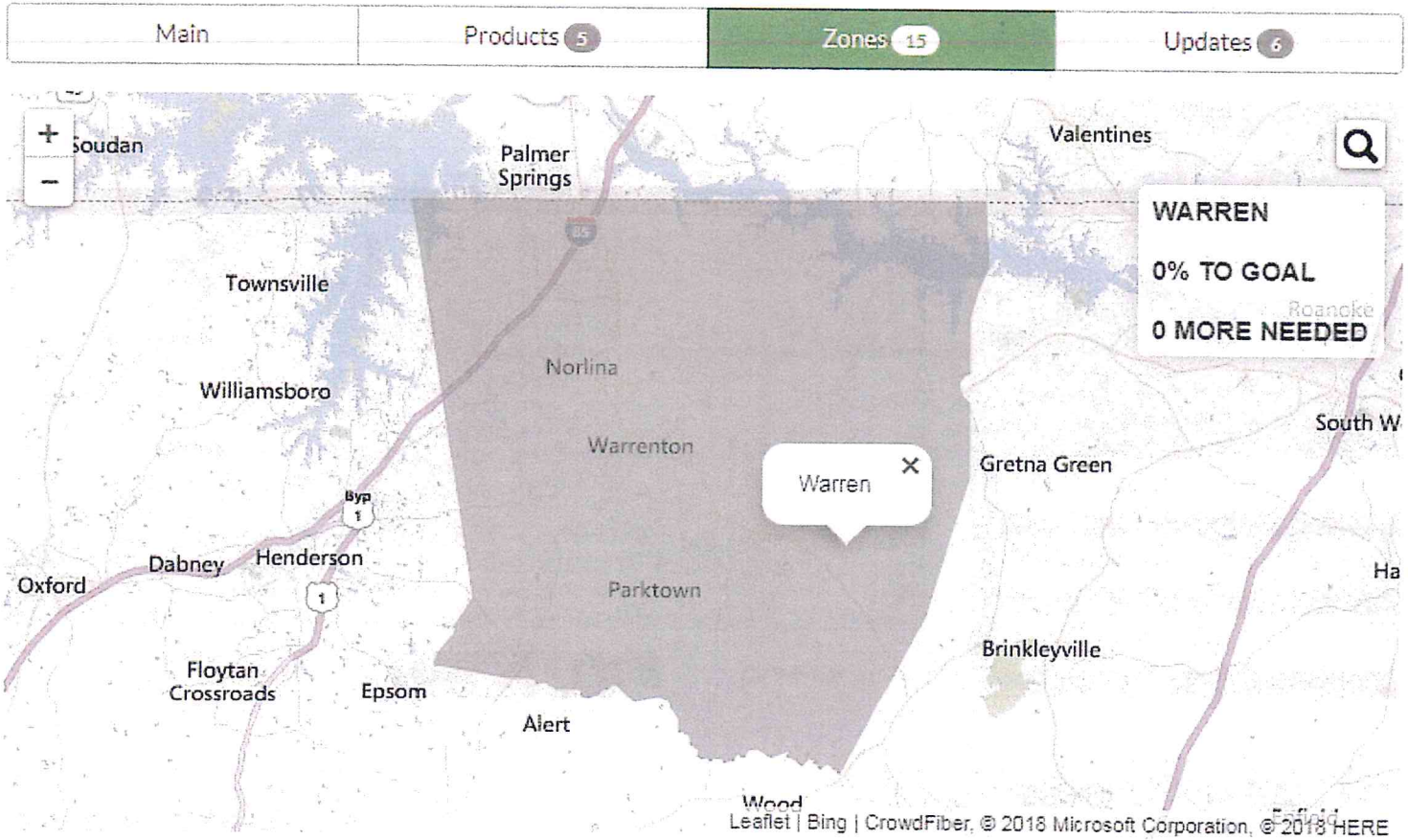


Section 5

Timeline

1. The timeline will be agreed-upon between RiverStreet Networks and Warren County. Regardless of time of year, the goal of RiverStreet Networks is to perform work as minimally invasive and aesthetically-conscientious as possible. Disturbances to soil, roadways, driveways, and natural/manmade surroundings will be strictly observed and in line with RiverStreet's goal. With this goal in mind, RiverStreet respectfully expects tolerance and consideration for the subsequent, albeit temporary, visual and physical disturbances.

2. Most material procurement is typically on a 6-week lead time. Fiber-optic cable lead times widely vary from 6 weeks to 52 weeks depending on the volatility of the industry's needs. Concurrent and upcoming projects from carrier companies dictate these fluctuations, and RiverStreet Networks has no influence on improving lead times. Proper and advance planning help to mitigate longer lead times and prevent delays.

3. Construction, including utility locating/verification, fiber plowing, and drop placement, will need to be taken into consideration during the development of the timeline and throughout the project.

4. Building and remote cabinet installation/construction and installation, provisioning, and commissioning of central office switching equipment will typically run concurrent to general outside plant construction.

5. Inclement weather, material shortages, and fiber and drop placement influence the project timeline. Furthermore, if fiber placement requires substantial deviation from original staking plans, project timelines may be affected. Any project delays will be immediately communicated to Warren County's point of contact.

6. The project will be managed between RiverStreet Networks' Managed Services Group and one point of contact representing Warren County. Scheduled and unscheduled conference calls will be held throughout the life of the project. Additionally, on-site inspections and meetings will occur during the project's progression.

Section 6

Funding Options

Please find below a few of the funding opportunities available that RiverStreet has made available and researched for this project. This is not intended to be a complete list but a jumping point for the broadband build in Warren County.

A. RiverStreet Networks Contribution – of $1,000,000 a year for three years

B. Economic Development Administration[4] – Matching funds
Funding available up to $2.5 million (Found by Robert Davie)

C. Federal Broadband Investment in Omnibus[5] - $600 million allocated for rural broadband investment by the U.S. Department of Agriculture

D. N.C. Office of Governor Broadband Funding Mechanism – Proposed Budget of $17 million for broadband infrastructure

E. N.C. Legislature State Broadband Infrastructure Program – Proposed $10 million in matching grant funds

F. Golden Leaf Foundation[6] – Broadband Grant Opportunities Occurring

G. United States Department of Agriculture[7] – Community Connect Grant

[4] https://www.eda.gov/funding-opportunities
[5] https://www.usda.gov/media/press-releases/2018/03/23/secretary-perdue-applauds-broadband-investment-included-omnibus
[6] https://www.goldenleaf.org/grant-seekers/open-grants-program
[7] https://www.rd.usda.gov/programs-services/community-connect-grants

Section 7

Project Cost

The design outlined below will reflect the interpretation of both the short term and long term strategy as designed by the professionals at RiverStreet. There are many ways to design a network, but given the experience and expertise of RiverStreet personnel this document represents the best adaptation of how RiverStreet would build such a network for future growth and expansion in the study area.

The overall design was based on a 30% subscriber take rate. The costs of the options are broken down below.

Option 1 - Full fiber overbuild. Connecting 30% of passed subs.

1. Estimated cost -- $37,000,000 - $38,500,000 depending on transport between Central Offices.
2. Estimated Total of **$38,500,000**

Option 2 - Backbone connectivity of customers no more than 1,000 feet off the main ring connecting 30% of those subs passed.

1. Estimated cost -- $9,500,000 for Central Office and Engineering/Construction and $1,000,000 for Central Office Transport.
2. Estimated cost -- $1,650,000 for Spurs to ten wireless locations for lower income fixed wireless access points from ring.
3. Estimated Total of **$12,152,000**

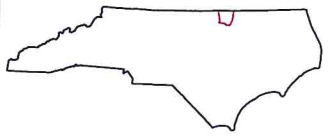
Option 3 - Backbone connectivity of customers no more than 1,000 feet off the main ring connecting 30% of those subs passed as well as a solution utilizing ***licensed*** fixed-wireless to reach 3,249 additional customers within 1/2 half-mile of the ring or towers. There's much overlap in this solution because this does not equate to 60% of the customers being connected.

1. Estimated cost -- $9,500,000 for CO and Engineering/Construction and $1,000,000 for Central Office Transport.
2. Estimated cost -- $7,300,000 for fixed-wireless including CPE to all proposed towers.
3. Estimated Total of **$17,800,000**.

Option 4 - Backbone connectivity of customers no more than 1,000 feet off the main ring connecting 30% of those subs passed as well as a solution utilizing ***unlicensed*** fixed-wireless to reach 3,249 additional customers within 1/2 half-mile of the ring or towers. There's much overlap in this solution because this does not equate to 60% of the customers being connected.

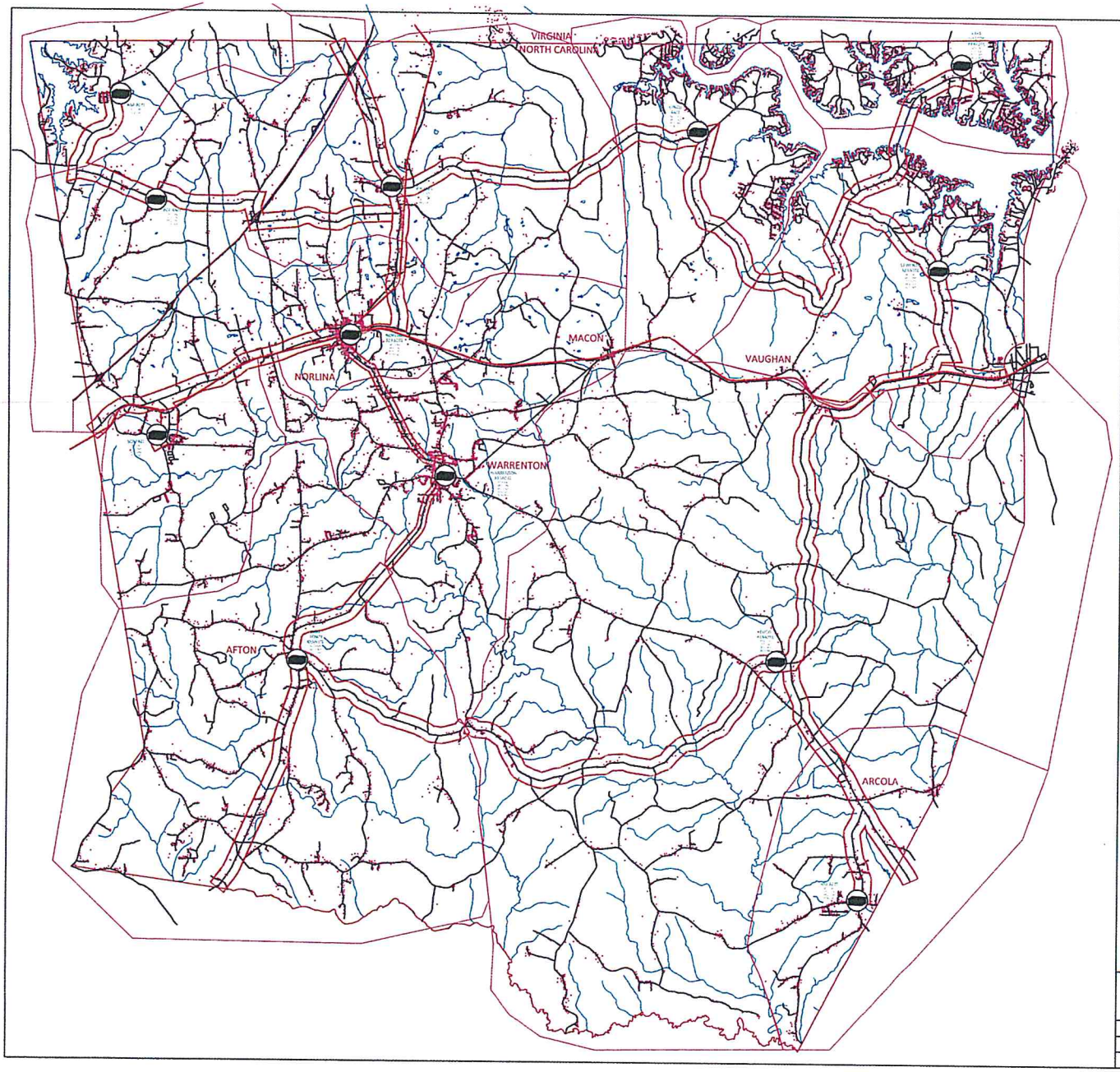
1. Estimated cost -- $9,500,000 for CO and Engineering/Construction and $1,000,000 for CO Transport.
2. Estimated cost -- $6,000,000 for fixed-wireless including CPE to all proposed towers.
3. Total of **$16,500,000**.

Section 8

WARRENTON, NC

DRAWINGS IN SET:
FIBER RING
FIBER ROUTES
FIBER CABLES
AREAS OF IMPORTANCE

FIBER BUILD COST STUDY FOR WARREN COUNTY, NC
PROVIDED BY:

RiverStreet
NETWORKS



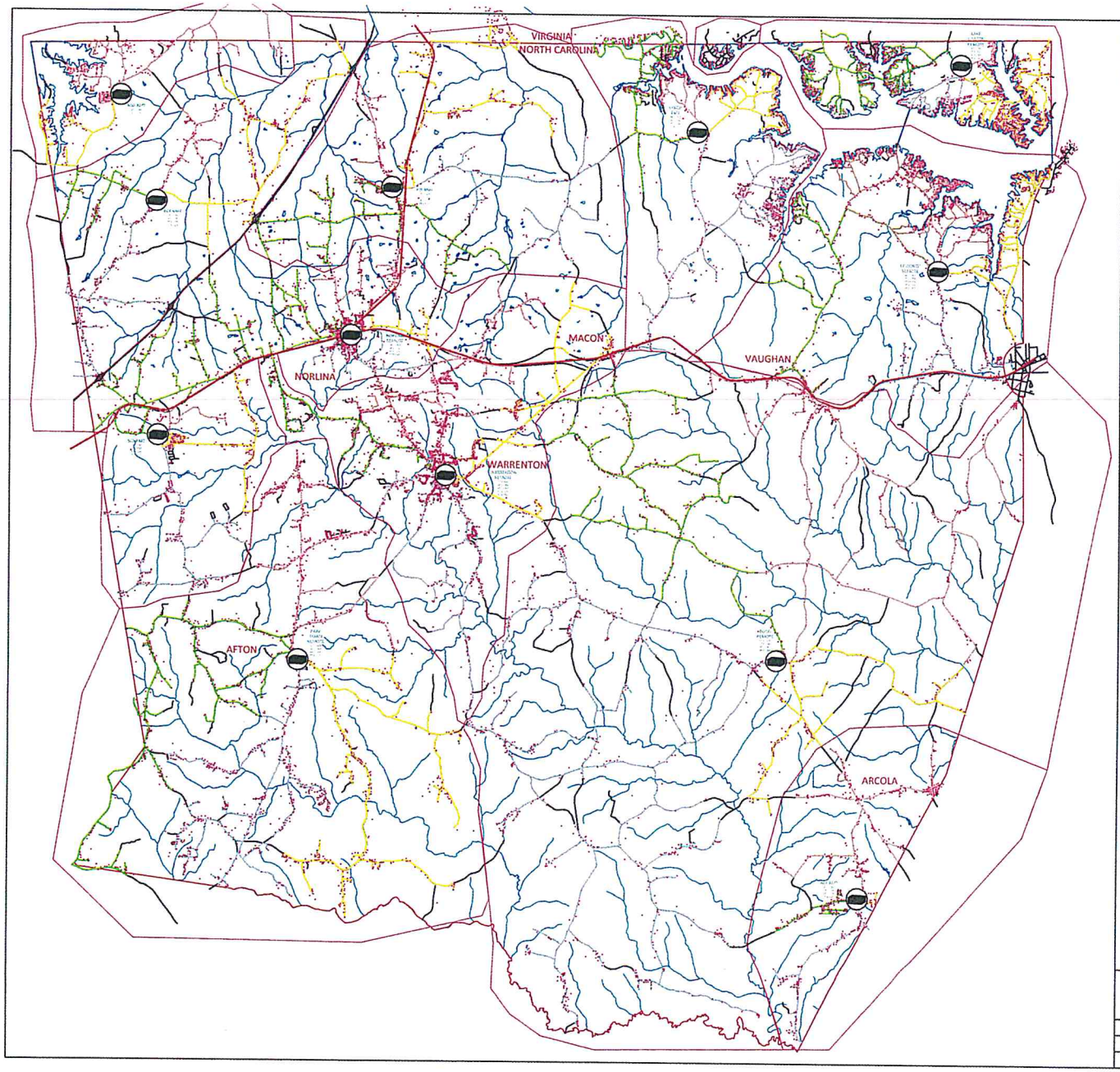
LEGEND

- REMOTE
- HALIWA-SAPONI TRIBAL AREA
- FIBER RING (TRANSPORT CABLE)
- RAILWAY SYSTEM
- 1 144LT WARRENTON REMOTE BOUNDARY NORTH
- 2 144LT WARRENTON REMOTE BOUNDARY SOUTH
- 3 144LT NORLINA/NORTH RAY JAY REMOTE BOUNDARY
- 4 144LT RAY JAY BOUNDARY WEST
- 5 144LT LYNCH REMOTE BOUNDARY WEST
- 6 144LT LYNCH REMOTE BOUNDARY EAST
- 7 144LT EPWORTH REMOTE BOUNDARY WEST
- 8 144LT EPWORTH REMOTE BOUNDARY SOUTH
- 9 144LT BUGG REMOTE BOUNDARY NORTH
- 10 144LT BUGG REMOTE BOUNDARY WEST
- 11 144LT PARKTOWN REMOTE BOUNDARY EAST
- 12 144LT PARKTOWN REMOTE BOUNDARY NORTH
- 13 144LT WARRENTON REMOTE BOUNDARY SOUTH
- 14 144LT NORLINA REMOTE BOUNDARY WEST
- 15 144LT BUCHANON REMOTE BOUNDARY WEST
- 16 144LT RAY JAY REMOTE BOUNDARY NORTH
- 17 144LT LAKE GASTON REMOTE BOUNDARY NORTH
- 18 144LT EPWORTH REMOTE BOUNDARY LITTLETOWN
- 19 144LT BUGG/ARCOLA REMOTE BOUNDARY SOUTH
- 20 144LT PARKTOWN REMOTE BOUNDARY SOUTH
- 21 144LT NUT BUSH REMOTE BOUNDARY NORTH

FIBER RING

RiverStreet NETWORKS

FILE NAME: WARREN COUNTY FIBER BUILD	
CREATED BY: SSB	PRINT DATE: 3/23/18
CREATION DATE: 1/5/18	LAST EDITED: 3/1/18



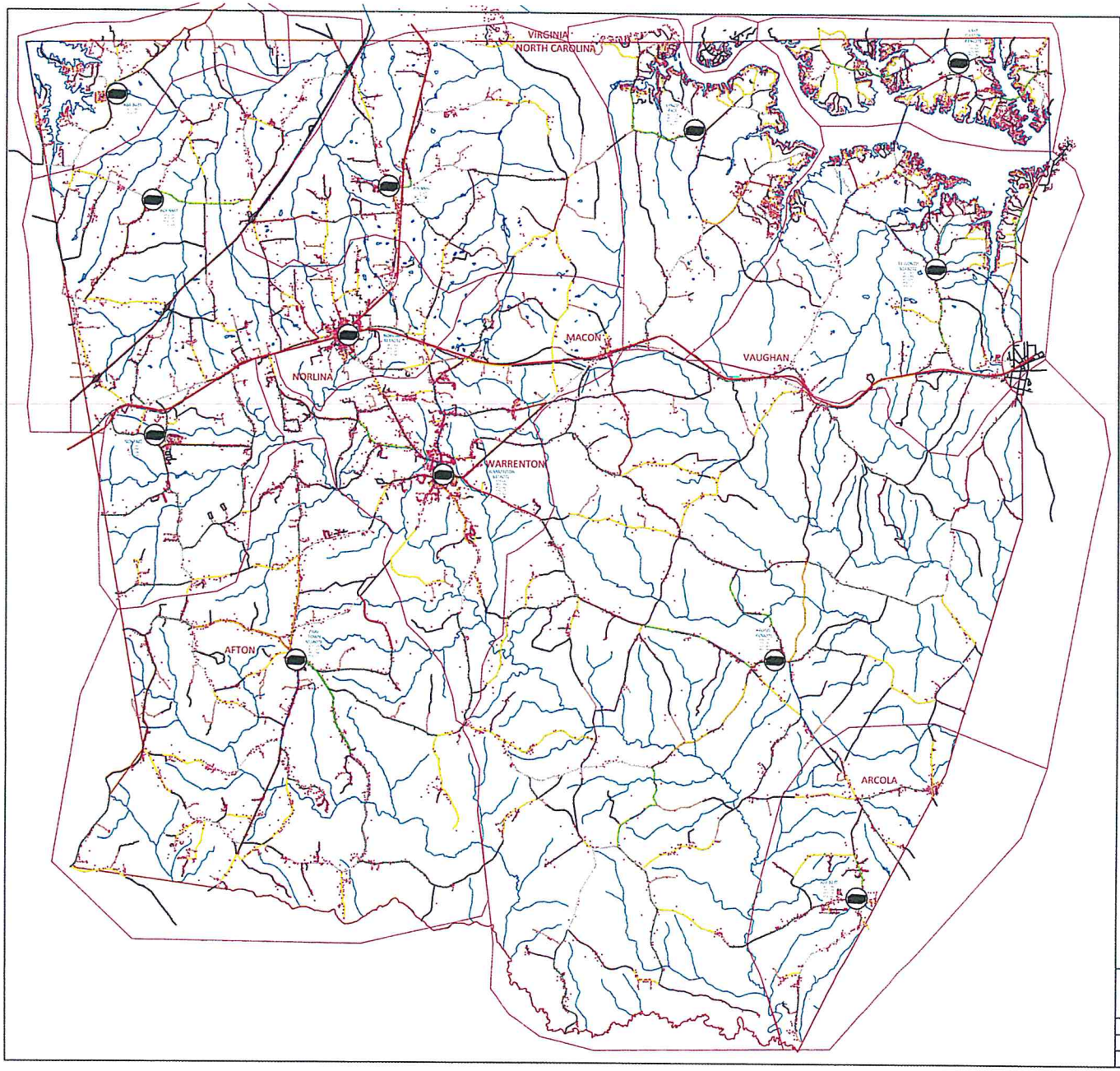
LEGEND

- REMOTE
- HALIWA-SAPONI TRIBAL AREA
- RAILWAY SYSTEM
- ROUTE 1 (SEE PLAN FOR SERVING REMOTE)
- ROUTE 2 (SEE PLAN FOR SERVING REMOTE)
- ROUTE 3 (SEE PLAN FOR SERVING REMOTE)
- ROUTE 4 (SEE PLAN FOR SERVING REMOTE)
- ROUTE 5 (SEE PLAN FOR SERVING REMOTE)

FIBER ROUTES

RiverStreet NETWORKS

FILE NAME: WARREN COUNTY FIBER BUILD	
CREATED BY: SSB	PRINT DATE: 3/23/18
CREATION DATE: 1/5/18	LAST EDITED: 3/1/18



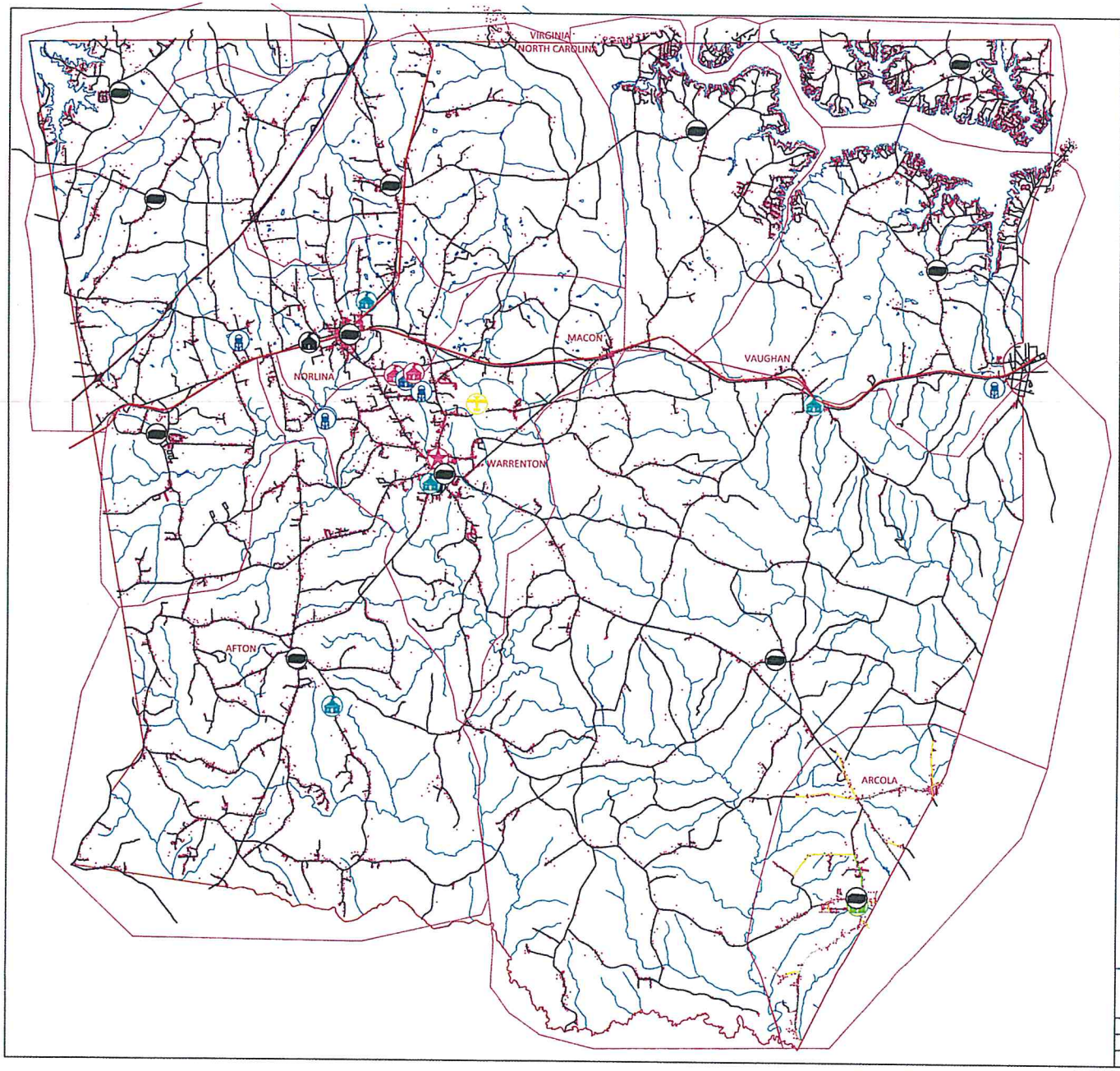
LEGEND

- REMOTE
- HALIWA-SAPONI TRIBAL AREA
- RAILWAY SYSTEM
- FIBER CABLE = 12 RIBBON
- FIBER CABLE = 24 RIBBON
- FIBER CABLE = 48 RIBBON
- FIBER CABLE = 72 RIBBON
- FIBER CABLE = 96 RIBBON
- FIBER CABLE = 144 RIBBON
- FIBER CABLE = 216 RIBBON
- FIBER CABLE = 288 RIBBON
- FIBER CABLE = 432 RIBBON
- FIBER CABLE = 576 RIBBON
- FIBER CABLE = 864 RIBBON

FIBER CABLES

RiverStreet NETWORKS

FILE NAME: WARREN COUNTY FIBER BUILD	
CREATED BY: SSB	PRINT DATE: 3/23/18
CREATION DATE: 1/5/18	LAST EDITED: 3/1/18



LEGEND

- ELEMENTARY SCHOOLS (4)
- MIDDLE SCHOOLS (1)
- HIGH SCHOOLS (3)
- TRIBAL SCHOOLS (1)
- BUS GARAGE & BOARD OF ED.
- ANCHOR INSTITUTIONS
- CELL TOWERS (13)
- LANDFILL/TRASH DUMP
- AIRPORT
- REMOTE
- WATER TOWER
- HALIWA-SAPONI TRIBAL AREA
- RAILWAY SYSTEM

AREAS OF IMPORTANCE

RiverStreet NETWORKS

FILE NAME: WARREN COUNTY FIBER BUILD	
CREATED BY: SSB	PRINT DATE: 3/23/18
CREATION DATE: 1/5/18	LAST EDITED: 3/1/18

Section 9

Estimate Direct Bury

Warren County Transport Ring and backbone

Road Miles	3.03	1.29	4.48	5.60	2.27	4.12	7.18	4.21	8.03	9.07	4.52	3.45	2.42	7.82	6.44	3.75	4.73	2.13	8.36	5.80	4.09	102.79
Cable miles	3.28	1.36	4.81	6.00	2.43	4.44	7.69	4.53	8.62	9.73	4.87	3.70	2.60	9.62	6.76	3.94	4.96	2.23	8.79	6.10	4.30	110.78

Units	#1 WRF North Boundary	#2 NLF South Boundary	#3 NLF North RJF	#4 RJF West Boundary	#5 LYF West Boundary	#6 LYF East Boundary	#7 EPMF West Boundary	#8 EPWF South Boundary	#9 BGF North Boundary	#10 BGF West Boundary	#11 PTF East Boundary	#12 PTF North Boundary	#13 WRF South Boundary	#14 NLF West to Co Line	#15 West to BCF Remote	#16 RJF North to VA	#17 Eaton Ferry North to Lake Gaston	#18 Hwy 158 to Littleton	#19 BGF South to Co Line	#20 PTF South to Co Line	#21 BCF to NBF	Final No. of units	Labor	Materials	Labor & Materials	Revised Price with new unit totals	Labor	Material
30/6 Pole	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	42	$ 382.50	$ 107.00	$ 489.50	$ 20,559.00	$ 16,065.00	$ 4,494.00
BA3																						0	$ 30.00	$ 28.89	$ 58.89	$ -	$ -	$ -
BDO5																						0	$ 80.00	$ 81.28	$ 161.28	$ -	$ -	$ -
BDO7																						0	$ 120.00	$ 407.68	$ 527.68	$ -	$ -	$ -
BFO12																						0	$ 1.10	$ 0.30	$ 1.40	$ -	$ -	$ -
BFO24R																						0	$ 1.10	$ 0.42	$ 1.52	$ -	$ -	$ -
BFO48R																						0	$ 2.00	$ 0.56	$ 2.56	$ -	$ -	$ -
BFO72R																						0	$ 2.00	$ 0.63	$ 2.63	$ -	$ -	$ -
BFO96R																						0	$ 2.00	$ 0.88	$ 2.88	$ -	$ -	$ -
BFO144R																						0	$ 2.00	$ 1.11	$ 3.11	$ -	$ -	$ -
BFO216R																						0	$ 2.00	$ 1.44	$ 3.44	$ -	$ -	$ -
BFO288R																						0	$ 2.00	$ 2.14	$ 4.14	$ -	$ -	$ -
BFO432R																						0	$ 2.00	$ 2.43	$ 4.43	$ -	$ -	$ -
BFO576R																						0	$ 2.00	$ 3.24	$ 5.24	$ -	$ -	$ -
BFO864R																						0	$ 2.00	$ 4.80	$ 6.80	$ -	$ -	$ -
BFO144LT	17300	7200	25400	31700	12850	23450	40600	23900	45500	51400	25700	19550	13750	50800	35700	20800	26200	11800	46400	32200	22700	584900	$ 1.10	$ 1.11	$ 2.21	$ 1,292,629.00	$ 643,390.00	$ 649,239.00
BHF(36x72x36)	1	1	1	1	1	1	1	1	1	1	1	1	1									13	$ 555.00	$ 1,479.31	$ 2,034.31	$ 26,446.03	$ 7,215.00	$ 19,231.03
BHF(30x52x43)RD	10	4	15	18	7	13	23	14	26	29	15	11	8	29	20	12	15	7	27	18	13	334	$ 370.00	$ 576.20	$ 946.20	$ 316,247.07	$ 123,664.57	$ 192,582.50
BHF(22x36x18)																						0	$ 168.00	$ 326.74	$ 494.74	$ -	$ -	$ -
BM2	10	4	15	18	7	13	23	14	26	29	15	11	8	29	20	12	15	7	27	18	13	334	$ 20.00	$ 23.88	$ 43.88	$ 14,665.95	$ 6,684.57	$ 7,981.38
BM6M	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	4200	$ 3.00	$ 1.00	$ 4.00	$ 16,800.00	$ 12,600.00	$ 4,200.00
BM53F	9	4	13	16	6	12	20	12	23	26	13	10	7	25	18	10	13	6	23	16	11	292	$ 20.00	$ 38.52	$ 58.52	$ 17,114.17	$ 5,849.00	$ 11,265.17
BM60(1x2")PD																						0	$ 10.00	$ 1.00	$ 11.00	$ -	$ -	$ -
BM60(2x2")PD	519	216	762	951	386	704	1218	717	1365	1542	771	587	413	1524	1071	624	786	354	1392	966	681	17547	$ 12.50	$ 2.00	$ 14.50	$ 254,431.50	$ 218,337.50	$ 35,094.00
BM60(3X2)PD																						0	$ 16.00	$ 3.00	$ 19.00	$ -	$ -	$ -
BM60(1-4")PD																						0	$ 16.00	$ 4.00	$ 20.00	$ -	$ -	$ -
BM60(2-4")PD																						0	$ 20.00	$ 8.00	$ 28.00	$ -	$ -	$ -
BM60(3-4")PD																						0	$ 20.00	$ 13.50	$ 33.50	$ -	$ -	$ -
BM71	346	144	508	634	257	469	812	478	910	1028	514	391	275	1016	714	416	524	236	928	644	454	11698	$ 9.00	$ -	$ 9.00	$ 105,282.00	$ 105,282.00	$ -
BM72																						0	$ 15.00	$ -	$ 15.00	$ -	$ -	$ -
BM73	250												75									325	$ 18.00	$ -	$ 18.00	$ 5,850.00	$ 5,850.00	$ -
BM81																						0	$ 20.00	$ 20.47	$ 40.47	$ -	$ -	$ -
BM82	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	126	$ 25.00	$ 27.07	$ 52.07	$ 6,560.82	$ 3,150.00	$ 3,410.82
BMCULV																						0	$ 225.00	$ -	$ 225.00	$ -	$ -	$ -
BMLOC																						0	$ 80.00	$ -	$ 80.00	$ -	$ -	$ -
BMMAXCELL	4600												2000									6600	$ 1.50	$ 11.80	$ 13.30	$ 87,780.00	$ 9,900.00	$ 77,880.00
BM-SK																						0	$ 1.50	$ 3.85	$ 5.35	$ -	$ -	$ -
BMWL																						0	$ 35.00	$ 15.00	$ 50.00	$ -	$ -	$ -
BMWL(B)																						0	$ 38.00	$ 20.00	$ 58.00	$ -	$ -	$ -
BMWM																						0	$ 60.00	$ -	$ 60.00	$ -	$ -	$ -
UD(2-4")DB	4600												2000									6600	$ 8.00	$ 8.06	$ 16.06	$ 105,996.00	$ 52,800.00	$ 53,196.00
UD(4-4")DB																						0	$ 12.00	$ 16.12	$ 28.12	$ -	$ -	$ -
PE1-2G(5/16"EHS)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	42	$ 100.00	$ 28.01	$ 128.01	$ 5,376.42	$ 4,200.00	$ 1,176.42
PF1-3(5/8"x7')	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	42	$ 150.00	$ 10.80	$ 160.80	$ 6,753.60	$ 6,300.00	$ 453.60
PM2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	42	$ 20.00	$ 23.88	$ 43.88	$ 1,842.96	$ 840.00	$ 1,002.96
PM2A																						0	$ 14.00	$ 5.16	$ 19.16	$ -	$ -	$ -
PM11	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	42	$ 10.00	$ 5.54	$ 15.54	$ 652.68	$ 420.00	$ 232.68
PM92S																						0	$ 50.00	$ 45.99	$ 95.99	$ -	$ -	$ -
PM92L	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	21	$ 75.00	$ 54.63	$ 129.63	$ 2,722.23	$ 1,575.00	$ 1,147.23
SEBO4																						0	$ 0.95	$ 0.23	$ 1.18	$ -	$ -	$ -
SEAO4																						0	$ 0.95	$ 0.23	$ 1.18	$ -	$ -	$ -
SEBO12																						0	$ 0.95	$ 0.28	$ 1.23	$ -	$ -	$ -
SEAO12																						0	$ 0.95	$ 0.28	$ 1.23	$ -	$ -	$ -
SUBSCRIBERS																						0						
NID																						0	$ 50.00	$ 446.00	$ 496.00	$ -	$ -	$ -
NID HOUSING																						0	$ 50.00	$ 36.00	$ 86.00	$ -	$ -	$ -
DROP SPLICE																						0	$ 75.00	$ -	$ 75.00	$ -	$ -	$ -
INSTALLS																						0	$ 100.00		$ 100.00	$ -	$ -	$ -
HBFO FB12																						0	$ 104.50	$ 151.80	$ 256.30	$ -	$ -	$ -
HBFO 144R-B6																						0	$ 182.88	$ 226.48	$ 409.36	$ -	$ -	$ -
HBFO 288R-D																						0	$ 209.00	$ 392.84	$ 601.84	$ -	$ -	$ -
HBFO 864R-600																						0	$ 209.00	$ 429.85	$ 638.85	$ -	$ -	$ -
HBFO 144LT-B6																						0	$ 182.88	$ 226.48	$ 409.36	$ -	$ -	$ -
HBFO 216LT-D	10	4	15	18	7	13	23	14	26	29	15	11	8	29	20	12	15	7	27	18	13	334	$ 209.00	$ 392.84	$ 601.84	$ 201,152.06	$ 69,853.77	$ 131,298.29
TRAY R-B																						0	$ -	$ 23.98	$ 23.98	$ -	$ -	$ -
TRAY LT-B																						0	$ -	$ 15.25	$ 15.25	$ -	$ -	$ -
TRAY R-D/600																						0	$ -	$ 35.96	$ 35.96	$ -	$ -	$ -
TRAY LT-D	13	5	19	24	10	17	30	18	34	38	19	15	10	38	27	15	19	9	34	24	17	434	$ -	$ 22.92	$ 22.92	$ 9,958.41	$ -	$ 9,958.41
HO-1	288	288	312	432	444	432	720	288	720	288	288	288	288	288	288	288	288	288	288	288	288	7380	$ 24.04	$ -	$ 24.04	$ 177,415.20	$ 177,415.20	$ -
HO-12																						0	$ 130.63	$ -	$ 130.63	$ -	$ -	$ -
Remote Building	1	1					1		1		1						1					6	$ -	$ 30,000.00	$ 30,000.00	$ 180,000.00	$ -	$ 180,000.00
RMT Cabinet			1		1									1	1				1		1	6	$ -	$ 20,000.00	$ 20,000.00	$ 120,000.00	$ -	$ 120,000.00
ECLE4201259-C7001B **Black**																						0	$ -	$ 2,597.95	$ 2,597.95	$ -	$ -	$ -
LHSE420123C-81001B **White**	2		3	4		2		2		3		3		1	2		1		1		1	25	$ -	$ 2,970.34	$ 2,970.34	$ 74,258.50	$ -	$ 74,258.50
OSE-ST-3-TQ (Ribbon OSE Splice Trays)	0		0	0		0		0		0		0		0	0		0		0		0	0	$ -	$ 35.91	$ 35.91	$ -	$ -	$ -
OSE-ST-1 (Loose Tube Splice Trays)	8		12	16		8		8		12		12		4	8		4		4		4	100	$ -	$ 30.18	$ 30.18	$ 3,018.00	$ -	$ 3,018.00
CDF-ER-7A-19	4		3	3		3		3		3		3		3	3		3		3		3	37	$ -	$ 202.31	$ 202.31	$ 7,485.47	$ -	$ 7,485.47
CDF-IBU-7-6	6		5	5		5		5		5		5		5	5		5		5		5	61	$ -	$ 231.58	$ 231.58	$ 14,126.38	$ -	$ 14,126.38
02-001337-001	10		5	5		5		5		5		5		5	5		5		5		5	65	$ -	$ 11.55	$ 11.55	$ 750.75	$ -	$ 750.75
A0402798	2		3	4		2		2		3		3		1	2		1		1		1	25	$ -	$ 11.61	$ 11.61	$ 290.25	$ -	$ 290.25

Warren County Estimate

Transport ONLY

OSE-CBL-35																						0	$ -	$ 29.01	$ 29.01	$ -	$ -	$ -
OSE-CBL-36	2		3	4		2		2		3		3		1	2		1		1		1	25	$ -	$ 29.01	$ 29.01	$ 725.25	$ -	$ 725.25
OSE-CBL-37																						0	$ -	$ 29.01	$ 29.01	$ -	$ -	$ -
OSE-CBL-38																						0	$ -	$ 29.01	$ 29.01	$ -	$ -	$ -
OSE-CBL-39																						0	$ -	$ 29.01	$ 29.01	$ -	$ -	$ -
OSE-HD0-W0-1	3		2	2		2		2		2		2		2	2		2		2		2	25	$ -	$ 967.71	$ 967.71	$ 24,192.75	$ -	$ 24,192.75
CDF-HUB-05	24		20	20		20		20		20		20		20	20		20		20		20	244	$ -	$ 20.82	$ 20.82	$ 5,080.08	$ -	$ 5,080.08
15-211-14																						0	$ -	$ 77.67	$ 77.67	$ -	$ -	$ -
RBN-TERM-KIT-FMS																						0	$ -	$ 85.01	$ 85.01	$ -	$ -	$ -
SCF-KT-HS2																						0	$ -	$ 7.78	$ 7.78	$ -	$ -	$ -
LTC-END-01																						0	$ -	$ 27.14	$ 27.14	$ -	$ -	$ -
COE Remote Material	$375,000.00						$200,000.00		$200,000.00													$775,000.00		$ 775,000.00	$ 775,000.00	$ 775,000.00	$ -	$ 775,000.00
COE Annual Maintenance	$71,250.00						$30,000.00		$30,000.00													$131,250.00	$ 131,250.00		$ 131,250.00	$ 131,250.00	$ 131,250.00	
COE Installation Labor and Travel																						0			$ -	$ -	$ -	$ -
Option C - COE Internet/TV Backhaul (Annual)	$100,000.00																					$100,000.00		$ 100,000.00	$ 100,000.00	$ 100,000.00	$ -	$ 100,000.00
Engineering - Inspection 5%																						0			$ 205,620.63	$ 205,620.63	$ 205,620.63	$ -
																									Grand Total	$ 4,318,033.17	$ 1,809,262.24	$ 2,508,770.92
ECLE4201259-C7001B **Black**	2597.95																											
LHSE420123C-81001B **White**	2970.34																											
OSE-ST-3-TQ (Ribbon OSE Splice Trays)	35.91																											
OSE-ST-1 (Loose Tube Splice Trays)	30.18																											
CDF-ER-7A-19	202.31		Corning - Equipment Rack - 7 foot / 19" Powder Black Coated. Used for Optical and Active Equipment Mounting.																									
CDF-IBU-7-6	231.58		Corning - Interbay Jumper Storage Unit for use with the 19" Rack Listed Above. Used for Vertical Jumper Management on the Rack.																									
02-001337-001	11.55		Corning-OSE Universal Cable Entry Kit. Entry Kits are for use with indoor cables only. Provides Stain Relief by compression fitting.																									
A0402798	11.61		0.75-IN Watertight Connector Kit 0.187-0.812in																									
OSE-CBL-35	29.01		Corning-OSE Cable Entry KIT for OSP cable. Includes Strain relief bracket & grounding hardware. Fits 96 SST Ribbon Cable.																									
OSE-CBL-36	29.01		Corning-OSE Cable Entry KIT for OSP cable. Includes Strain relief bracket & grounding hardware. Fits 216 SST Ribbon Cable.																									
OSE-CBL-37	29.01		Corning-OSE Cable Entry KIT for OSP cable. Includes Strain relief bracket & grounding hardware. Fits 288 SST Ribbon Cable.																									
OSE-CBL-38	29.01		Corning-OSE Cable Entry KIT for OSP cable. Includes Strain relief bracket & grounding hardware.																									
OSE-CBL-39	29.01		Corning-OSE Cable Entry KIT for OSP cable. Includes Strain relief bracket & grounding hardware.																									
OSE-HD0-W0-1	967.71		Corning - Wall Mounted Optical Splice Enclosure. Used to complete up to 1728 Mass Fusion Transition Splices.																									
CDF-HUB-05	20.82		Corning - Jumper Management Spools which are attached to the above listed IBU.																									
15-211-14	77.67		Corning-Ribbon Cable Furcation Kit for use with the Pre-Stubbed Cable Ends. Required to splice cable fiber count such that there are 6 ribbons in each tube for routing to splice trays.																									
RBN-TERM-KIT-FMS	85.01		Kit with 190 feet of Braided Tubing.																									
SCF-KT-HS2	7.78		7" Heat Shrink that will cover the End Plug.																									
LTC-END-01	27.14		Epoxy Plug Solution																									

Warren County Estimate

Cell: B97
Comment: Includes Router, Softswitch, WDM
-Jody Call

Transport ONLY

Estimate Direct Bury

Warren County Ring Construction

Road Miles	3.03	1.29	4.48	5.60	2.27	4.12	7.18	4.21	8.03	9.07	4.52	3.45	2.42	7.82	6.44	3.75	4.73	2.13	8.36	5.80	4.09	102.79								
Cable miles	6.63	3.24	8.15	8.32	5.09	11.43	16.25	9.55	16.62	21.62	10.12	7.15	4.89	17.70	13.30	6.85	8.56	5.06	16.13	13.94	8.86	219.45								
Units	#1 WRF North Boundary	#2 NLF South Boundary	#3 NLF North RJF	#4 RJF West Boundary	#5 LYF West Boundary	#6 LYF East Boundary	#7 EPWF West Boundary	#8 EPWF South Boundary	#9 BGF North Boundary	#10 BGF West Boundary	#11 PTF East Boundary	#12 PTF North Boundary	#13 WRF South Boundary	#14 NLF West to Co Line	#15 West to BCF Remote	#16 RJF North to VA	#17 Eaton Ferry North to LGF	#18 Hwy 158 to Littleton (EPWF)	#19 BGF South to Co Line	#20 PTF South to Co Line	#21 BCF to NBF	Final No. of units	Labor	Materials	Labor & Materials	Revised Price with new unit totals	Labor	Material
30/6 Pole	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	42	$ 382.50	$ 107.00	$ 489.50	$ 20,559.00	$ 16,065.00	$ 4,494.00
BA3	2	4	5	6	3	16	10	11	5	27	15	13	8	16	8	11	7	3	9	10	12	203	$ 30.00	$ 28.89	$ 58.89	$ 11,942.30	$ 6,083.70	$ 5,858.60
BDO5	5	12	16	18	9	45	30	31	13	78	44	36	24	46	22	31	21	9	25	29	35	579	$ 80.00	$ 81.28	$ 161.28	$ 93,445.63	$ 46,352.00	$ 47,093.63
BDO7	1	3	4	5	2	11	7	8	3	20	11	9	6	12	6	8	5	2	6	7	9	145	$ 120.00	$ 407.68	$ 527.68	$ 76,434.45	$ 17,382.00	$ 59,052.45
BFO12		950	3700		1250					1000									1250	1100		9250	$ 1.10	$ 0.30	$ 1.40	$ 12,950.00	$ 10,175.00	$ 2,775.00
BFO24R		2900	4100	1750	3200	22300	5300	4000	5000	10250	2200						1050	1850		9550		73450	$ 1.10	$ 0.42	$ 1.52	$ 111,644.00	$ 80,795.00	$ 30,849.00
BFO48R	2450			3050			9550	5850		4550	3800	4100			1550	6250	1600		3200	4050	6900	56900	$ 2.00	$ 0.56	$ 2.56	$ 145,664.00	$ 113,800.00	$ 31,864.00
BFO72R				4350				5850	1450		15800		4900	12450		4900			8250			57950	$ 2.00	$ 0.63	$ 2.63	$ 152,408.50	$ 115,900.00	$ 36,508.50
BFO96R															9550		5000					14550	$ 2.00	$ 0.88	$ 2.88	$ 41,904.00	$ 29,100.00	$ 12,804.00
BFO144R		2300								23250		14100	7150	10750		4200	2600	2850			10400	77600	$ 2.00	$ 1.11	$ 3.11	$ 241,336.00	$ 155,200.00	$ 86,136.00
BFO216R			9850				14800								9350		2950	10200				47150	$ 2.00	$ 1.44	$ 3.44	$ 162,196.00	$ 94,300.00	$ 67,896.00
BFO288R	8400								21450					15600					7900	15000	6800	75150	$ 2.00	$ 2.14	$ 4.14	$ 311,121.00	$ 150,300.00	$ 160,821.00
BFO432R		3750		3100	9600			10800			5950				14050				6200			53450	$ 2.00	$ 2.43	$ 4.43	$ 236,783.50	$ 106,900.00	$ 129,883.50
BFO576R									14350	23700				3850			5780					47680	$ 2.00	$ 3.24	$ 5.24	$ 249,843.20	$ 95,360.00	$ 154,483.20
BFO864R	7300					14600	15550												11950	11700		61100	$ 2.00	$ 4.80	$ 6.80	$ 415,480.00	$ 122,200.00	$ 293,280.00
BFO144LT	16850	7200	25400	31700	12850	23450	40600	23900	45500	51400	25700	19550	13750	50800	35700	20800	26200	11800	46400	32200	22700	584450	$ 1.10	$ 1.11	$ 2.21	$ 1,291,634.50	$ 642,895.00	$ 648,739.50
BHF(36x72x36)	1	1	1	1	1	1	1	1	1	1	1	1	1									13	$ 555.00	$ 1,479.31	$ 2,034.31	$ 26,446.03	$ 7,215.00	$ 19,231.03
BHF(30x52x43)RD	19	6	20	20	13	22	41	20	46	43	18	11	8	40	34	12	20	13	41	34	17	497	$ 370.00	$ 576.20	$ 946.20	$ 469,845.07	$ 183,727.20	$ 286,117.87
BHF(22x36x18)																						0	$ 168.00	$ 326.74	$ 494.74	$ -	$ -	$ -
BM2	25	22	40	43	24	77	78	59	63	141	73	57	38	98	62	50	46	24	73	70	60	1221	$ 20.00	$ 23.88	$ 43.88	$ 53,569.14	$ 24,416.20	$ 29,152.94
BM6M	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	4200	$ 3.00	$ 1.00	$ 4.00	$ 16,800.00	$ 12,600.00	$ 4,200.00
BM53F	18	9	22	22	13	30	43	25	44	57	27	19	13	47	35	18	23	13	43	37	23	579	$ 20.00	$ 38.52	$ 58.52	$ 33,902.98	$ 11,586.80	$ 22,316.18
BM60(1x2")PD																						0	$ 10.00	$ 1.00	$ 11.00	$ -	$ -	$ -
BM60(2x2")PD	545	297	530	368	422	1107	1356	795	1268	1883	833	546	362	1280	1035	461	569	447	1163	1242	723	17227	$ 12.50	$ 2.00	$ 14.50	$ 249,790.05	$ 215,336.25	$ 34,453.80
BM60(3X2)PD																						0	$ 16.00	$ 3.00	$ 19.00	$ -	$ -	$ -
BM60(1-4")PD																						0	$ 16.00	$ 4.00	$ 20.00	$ -	$ -	$ -
BM60(2-4")PD																						0	$ 20.00	$ 8.00	$ 28.00	$ -	$ -	$ -
BM60(3-4")PD																						0	$ 20.00	$ 13.50	$ 33.50	$ -	$ -	$ -
BM71	337	144	508	634	257	469	812	478	910	1028	514	391	275	1016	714	416	524	236	928	644	454	11689	$ 9.00	$ -	$ 9.00	$ 105,201.00	$ 105,201.00	$ -
BM72																						0	$ 15.00	$ -	$ 15.00	$ -	$ -	$ -
BM73	250												75									325	$ 18.00	$ -	$ 18.00	$ 5,850.00	$ 5,850.00	$ -
BM81																						0	$ 20.00	$ 20.47	$ 40.47	$ -	$ -	$ -
BM82	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	126	$ 25.00	$ 27.07	$ 52.07	$ 6,560.82	$ 3,150.00	$ 3,410.82
BMCULV																						0	$ 225.00	$ -	$ 225.00	$ -	$ -	$ -
BMLOC																						0	$ 80.00	$ -	$ 80.00	$ -	$ -	$ -
BMMAXCELL	4600												2000									6600	$ 1.50	$ 11.80	$ 13.30	$ 87,780.00	$ 9,900.00	$ 77,880.00
BM-SK																						0	$ 1.50	$ 3.85	$ 5.35	$ -	$ -	$ -
BMWL																						0	$ 35.00	$ 15.00	$ 50.00	$ -	$ -	$ -
BMWL(B)																						0	$ 38.00	$ 20.00	$ 58.00	$ -	$ -	$ -
BMWM																						0	$ 60.00	$ -	$ 60.00	$ -	$ -	$ -
UD(2-4")DB	4600												2000									6600	$ 8.00	$ 8.06	$ 16.06	$ 105,996.00	$ 52,800.00	$ 53,196.00
UD(4-4")DB																						0	$ 12.00	$ 16.12	$ 28.12	$ -	$ -	$ -
PE1-2G(5/16"EHS)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	42	$ 100.00	$ 28.01	$ 128.01	$ 5,376.42	$ 4,200.00	$ 1,176.42
PF1-3(5/8"x7')	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	42	$ 150.00	$ 10.80	$ 160.80	$ 6,753.60	$ 6,300.00	$ 453.60
PM2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	42	$ 20.00	$ 23.88	$ 43.88	$ 1,842.96	$ 840.00	$ 1,002.96
PM2A																						0	$ 14.00	$ 5.16	$ 19.16	$ -	$ -	$ -
PM11	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	42	$ 10.00	$ 5.54	$ 15.54	$ 652.68	$ 420.00	$ 232.68
PM92S																						0	$ 50.00	$ 45.99	$ 95.99	$ -	$ -	$ -
PM92L	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	21	$ 75.00	$ 54.63	$ 129.63	$ 2,722.23	$ 1,575.00	$ 1,147.23
SEBO4	51450	13350	25800	10500	3150	5850	16050	12750	11400	16500	5850	10200	12600	59250	12150	13650	22350	6450	28050	21150	10500	369000	$ 0.95	$ 0.23	$ 1.18	$ 435,420.00	$ 350,550.00	$ 84,870.00
SEAO4																						0	$ 0.95	$ 0.23	$ 1.18	$ -	$ -	$ -
SEBO12																						0	$ 0.95	$ 0.28	$ 1.23	$ -	$ -	$ -
SEAO12																						0	$ 0.95	$ 0.28	$ 1.23	$ -	$ -	$ -
SUBSCRIBERS	343	89	172	70	21	39	107	85	76	110	39	68	84	395	81	91	149	43	187	141	70	2460			$ -	$ -	$ -	$ -
NID	103	27	52	21	6	12	32	26	23	33	12	20	25	119	24	27	45	13	56	42	21	738	$ 50.00	$ 446.00	$ 496.00	$ 366,048.00	$ 36,900.00	$ 329,148.00
NID HOUSING	103	27	52	21	6	12	32	26	23	33	12	20	25	119	24	27	45	13	56	42	21	738	$ 50.00	$ 36.00	$ 86.00	$ 63,468.00	$ 36,900.00	$ 26,568.00
DROP SPLICE	103	27	52	21	6	12	32	26	23	33	12	20	25	119	24	27	45	13	56	42	21	738	$ 75.00	$ -	$ 75.00	$ 55,350.00	$ 55,350.00	$ -
INSTALLS	257	67	129	53	16	29	80	64	57	83	29	51	63	296	61	68	112	32	140	106	53	1845	$ 100.00	$ -	$ 100.00	$ 184,500.00	$ 184,500.00	$ -
HBFO FB12	5	12	16	18	9	45	30	31	13	78	44	36	24	46	22	31	21	9	25	29	35	579	$ 104.50	$ 151.80	$ 256.30	$ 148,500.74	$ 60,547.30	$ 87,953.44
HBFO 144R-B6	1	3	4	5	2	11	7	8	3	20	11	9	6	11.6	6	8	5	2	6	7	9	145	$ 182.88	$ 226.48	$ 409.36	$ 59,295.25	$ 26,490.17	$ 32,805.08
HBFO 288R-D	6	2	0	1	4	6	6	4	14	9	2	0	0	8	6	0	2	0	10	11	3	95	$ 209.00	$ 392.84	$ 601.84	$ 57,145.89	$ 19,844.97	$ 37,300.92
HBFO 864R-600	3	1	0	1	2	3	3	2	6	4	1	0	0	3	2	0	1	0	4	5	1	41	$ 209.00	$ 429.85	$ 638.85	$ 25,997.22	$ 8,504.99	$ 17,492.24
HBFO 144LT-B6																						0	$ 182.88	$ 226.48	$ 409.36	$ 16,658.22	$ 7,442.07	$ 9,216.16
HBFO 216LT-D	10	4	15	18	7	13	23	14	26	29	15	11	8	29	20	12	15	7	27	18	13	334	$ 209.00	$ 392.84	$ 601.84	$ 200,997.30	$ 69,800.03	$ 131,197.27
TRAY R-B	6	16	21	24	12	59	39	42	17	103	58	48	32	61	29	41	27	12	34	39	46	768	$ -	$ 23.98	$ 23.98	$ 18,408.57	$ -	$ 18,408.57
TRAY LT-B																						0	$ -	$ 15.25	$ 15.25	$ -	$ -	$ -
TRAY R-D/600	12	3	0	2	7	11	12	8	27	18	4	0	0	14	10	0	4	0	19	20	5	176	$ -	$ 35.96	$ 35.96	$ 6,341.64	$ -	$ 6,341.64
TRAY LT-D	13	5	19	24	10	17	30	18	34	38	19	15	10	38	27	15	19	9	34	24	17	434	$ -	$ 22.92	$ 22.92	$ 9,950.75	$ -	$ 9,950.75
HO-1	288	144	432	576	300	432	720	432	720	876	432	432	432	720	576	432	432	288	720	576	432	10392	$ 24.04	$ -	$ 24.04	$ 249,823.68	$ 249,823.68	$ -
HO-12	100	49	21	77	40	204	228	82	176	174	78	78	18	90	102	22	92	32	215	199	40	2117	$ 130.63	$ -	$ 130.63	$ 276,543.71	$ 276,543.71	$ -
Remote Building																						0	$ -	$ 30,000.00	$ 30,000.00	$ -	$ -	$ -
RMT Cabinet																						0	$ -	$ 20,000.00	$ 20,000.00	$ -	$ -	$ -
ECLE4201259-C7001B **Black**	24		12	9		12		20		14		17		5	7		14		6		5	145	$ -	$ 2,597.95	$ 2,597.95	$ 376,702.75	$ -	$ 376,702.75
LHSE420123C-81001B **White**	2		3	4		2		2		3		3		1	2		1		1		1	25	$ -	$ 2,970.34	$ 2,970.34	$ 74,258.50	$ -	$ 74,258.50
OSE-ST-3-TQ (Ribbon OSE Splice Trays)	24		12	9		12		20		14		17		5	7		14		6		5	145	$ -	$ 35.91	$ 35.91	$ 5,206.95	$ -	$ 5,206.95
OSE-ST-1 (Loose Tube Splice Trays)	8		12	16		8		8		12		12		4	8		4		4		4	100	$ -	$ 30.18	$ 30.18	$ 3,018.00	$ -	$ 3,018.00
CDF-ER-7A-19	4		3	3		3		3		3		3		3	3		3		3		3	37	$ -	$ 202.31	$ 202.31	$ 7,485.47	$ -	$ 7,485.47
CDF-IBU-7-6	6		5	5		5		5		5		5		5	5		5		5		5	61	$ -	$ 231.58	$ 231.58	$ 14,126.38	$ -	$ 14,126.38
02-001337-001	10		5	5		5		5		5		5		5	5		5		5		5	65	$ -	$ 11.55	$ 11.55	$ 750.75	$ -	$ 750.75
A0402798	26		15	13		14		22		17		20		6	9		15		7		6	170	$ -	$ 11.61	$ 11.61	$ 1,973.70	$ -	$ 1,973.70

Warren County Estimate

Ring Construction Cost

OSE-CBL-35				1									2			1		1			5	$ -	$ 29.01	$ 29.01	$ **145.05**		$ -	$ 145.05
OSE-CBL-36	2		3	6		3		2		3		3		1	4		1		2		1	31	$ -	$ 29.01	$ 29.01	$ **899.31**		$ -	$ 899.31
OSE-CBL-37	1		1			1		1						2	1		1				1	9	$ -	$ 29.01	$ 29.01	$ **261.09**		$ -	$ 261.09
OSE-CBL-38	1		3	2		1		2		4		3			1				2		1	20	$ -	$ 29.01	$ 29.01	$ **580.20**		$ -	$ 580.20
OSE-CBL-39	3					1		2				1					2					9	$ -	$ 29.01	$ 29.01	$ **261.09**		$ -	$ 261.09
OSE-HD0-W0-1	3		2	2		2		2		2		2		2	2		2		2		2	25	$ -	$ 967.71	$ 967.71	$ **24,192.75**		$ -	$ 24,192.75
CDF-HUB-05	24		20	20		20		20		20		20		20	20		20		20		20	244	$ -	$ 20.82	$ 20.82	$ **5,080.08**		$ -	$ 5,080.08
15-211-14	2		1	1		1		1		1		1		1	1		1		1		1	13	$ -	$ 77.67	$ 77.67	$ **1,009.71**		$ -	$ 1,009.71
RBN-TERM-KIT-FMS	2		1	1		1		1		1		1		1	1		1		1		1	13	$ -	$ 85.01	$ 85.01	$ **1,105.13**		$ -	$ 1,105.13
SCF-KT-HS2	4		3	2		2		4		4		4		0	1		2		1		1	28	$ -	$ 7.78	$ 7.78	$ **217.84**		$ -	$ 217.84
LTC-END-01	4		3	2		2		4		4		4		0	1		2		1		1	28	$ -	$ 27.14	$ 27.14	$ **759.92**		$ -	$ 759.92
COE Remote Material	$163,338.00		$176,958.00	$58,658.00		$51,478.00		$150,116.00		$159,162.00		$153,094.00		$24,344.00	$56,680.00		$145,080.00		$13,246.00		$4,716.00	$1,156,870.00			$ 1,156,870.00	$ 1,156,870.00	$ **1,156,870.00**		$ -	$ 1,156,870.00
COE Annual Maintenance	$24,500.70		$26,543.70	$8,798.70		$7,721.70		$22,517.40		$23,874.30		$22,964.10		$3,651.60	$8,502.00		$21,762.00		$1,986.90		$707.40	$173,530.50	$ 173,530.50			$ 173,530.50	$ **173,530.50**	$ 173,530.50	$ -
COE Installation Labor and Travel	$45,800.00		$20,280.00	$5,240.00		$5,240.00		$30,760.00		$30,760.00		$20,280.00			$5,240.00		$20,280.00					$183,880.00	$ 183,880.00			$ 183,880.00	$ **183,880.00**	$ 183,880.00	$ -
Option C - COE Internet/TV Backhaul (Annual)	$72,000.00																					$72,000.00				$ -	$ **72,000.00**	$ 72,000.00	$ -
Engineering - Inspection 5%																						0				$ 451,659.96	$ **451,659.96**	$ 451,659.96	$ -
																										Grand Total	**$ 9,484,859.17**	$ 4,712,192.52	$ 4,772,666.66

Estimate Direct Bury

Warren County DISTRIBUTION ONLY

Road Miles	97.55	63.55	61.28	25.96	45.64	64.32	58.00	89.64	186.63	32.39	116.49	32.49	873.94						
Cable miles	89.63	61.26	71.73	28.00	43.03	67.93	66.54	86.79	183.84	29.73	125.12	32.84	886.45						
Units	Warrenton Remote	Norlina Remote	Ray Jay RMT	Nut Bush RMT	Buchanon RMT	Lynch RMT	Lake Gaston Remote	Epworth Remote	Bugg Remote	Arcola RMT	Park Town Remote	Soul City RMT	Final No. of units	Labor	Materials	Labor & Materials	Revised Price with new unit totals	Labor	Material
30/6 Pole													**0**	$ 382.50	$ 107.00	$ 489.50	$ -	$ -	$ -
BA3	264	199	241	91	131	213	195	248	553	91	364	102	**2691**	$ 30.00	$ 28.89	$ 58.89	**$ 158,465.34**	$ 80,726.11	$ 77,739.24
BDO5	755	569	688	259	373	608	558	710	1579	261	1039	290	**7688**	$ 80.00	$ 81.28	$ 161.28	**$ 1,239,952.98**	$ 615,056.04	$ 624,896.94
BDO7	189	142	172	65	93	152	139	177	395	65	260	73	**1922**	$ 120.00	$ 407.68	$ 527.68	**$ 1,014,227.41**	$ 230,646.02	$ 783,581.39
BFO12	98500	81650	57000	38100	47200	58200	39450	45700	106400	19600	115250	21300	**728350**	$ 1.10	$ 0.30	$ 1.40	**$ 1,019,690.00**	$ 801,185.00	$ 218,505.00
BFO24R	65200	69000	81050	30500	35400	88750	79200	118000	279350	23050	144650	34900	**1049050**	$ 1.10	$ 0.42	$ 1.52	**$ 1,594,556.00**	$ 1,153,955.00	$ 440,601.00
BFO48R	88400	55250	61100	13500	38550	66650	85700	78350	159500	48000	99300	21100	**815400**	$ 2.00	$ 0.56	$ 2.56	**$ 2,087,424.00**	$ 1,630,800.00	$ 456,624.00
BFO72R	59900	37800	81050	9750	14000	44500	31800	44300	131550	19300	70550	59450	**603950**	$ 2.00	$ 0.63	$ 2.63	**$ 1,588,388.50**	$ 1,207,900.00	$ 380,488.50
BFO96R	26650	14150	26000	14850	7300	9700	21050	23450	43650		20450		**207250**	$ 2.00	$ 0.88	$ 2.88	**$ 596,880.00**	$ 414,500.00	$ 182,380.00
BFO144R	38950	26500	37950	22850	44050	36050	21650	45050	69150	20300	69300	8300	**440100**	$ 2.00	$ 1.11	$ 3.11	**$ 1,368,711.78**	$ 880,200.50	$ 488,511.28
BFO216R		8550	9550			8550	35550	27000	30000	12350	46850	8950	**187350**	$ 2.00	$ 1.44	$ 3.44	**$ 644,484.00**	$ 374,700.00	$ 269,784.00
BFO288R	45700	20950	9450	15500	26200	10400		11550	42650	8000	36650	19400	**246450**	$ 2.00	$ 2.14	$ 4.14	**$ 1,020,303.00**	$ 492,900.00	$ 527,403.00
BFO432R	15400	5400	15600	2800	14500	14650	17850	23350	56850	6350	16100		**188850**	$ 2.00	$ 2.43	$ 4.43	**$ 836,605.50**	$ 377,700.00	$ 458,905.50
BFO576R	10500	4200				9250		13300	38200		28850		**104300**	$ 2.00	$ 3.24	$ 5.24	**$ 546,532.00**	$ 208,600.00	$ 337,932.00
BFO864R	24050					11950	19100	28200	13400		12700		**109400**	$ 2.00	$ 4.80	$ 6.80	**$ 743,920.00**	$ 218,800.00	$ 525,120.00
BFO144LT													**0**	$ 1.10	$ 1.11	$ 2.21	$ -	$ -	$ -
BHF(36x72x36)													**0**	$ 555.00	$ 1,479.31	$ 2,034.31	$ -	$ -	$ -
BHF(30x52x43)RD	55	22	20	10	23	31	41	59	103	15	81	16	**478**	$ 370.00	$ 576.20	$ 946.20	**$ 452,202.50**	$ 176,828.29	$ 275,374.21
BHF(22x36x18)													**0**	$ 168.00	$ 326.74	$ 494.74	$ -	$ -	$ -
BM2	999	733	880	334	490	791	739	946	2077	341	1379	379	**10088**	$ 20.00	$ 23.88	$ 43.88	**$ 442,668.68**	$ 201,763.30	$ 240,905.38
BM6M													**0**	$ 3.00	$ 1.00	$ 4.00	$ -	$ -	$ -
BM53F	237	162	189	74	114	179	176	229	485	78	330	87	**2340**	$ 20.00	$ 38.52	$ 58.52	**$ 136,949.97**	$ 46,804.50	$ 90,145.47
BM60(1x2")PD	14198	9704	11363	4436	6816	10760	10541	13748	29121	4709	19820	5202	140414	$ 10.00	$ 1.00	$ 11.00	**$ 1,544,548.58**	$ 1,404,135.08	$ 140,413.51
BM60(2x2")PD	4733	3235	3788	1479	2272	3587	3514	4583	9707	1570	6607	1734	46805	$ 12.50	$ 2.00	$ 14.50	**$ 678,665.29**	$ 585,056.28	$ 93,609.01
BM60(3X2)PD													**0**	$ 16.00	$ 3.00	$ 19.00	$ -	$ -	$ -
BM60(1-4")PD													**0**	$ 16.00	$ 4.00	$ 20.00	$ -	$ -	$ -
BM60(2-4")PD													**0**	$ 20.00	$ 8.00	$ 28.00	$ -	$ -	$ -
BM60(3-4")PD													**0**	$ 20.00	$ 13.50	$ 33.50	$ -	$ -	$ -
BM71	9465	6469	7575	2957	4544	7173	7027	9165	19414	3139	13213	3468	93609	$ 9.00	$ -	$ 9.00	**$ 842,481.05**	$ 842,481.05	$ -
BM72													**0**	$ 15.00	$ -	$ 15.00	$ -	$ -	$ -
BM73													**0**	$ 18.00	$ -	$ 18.00	$ -	$ -	$ -
BM81													0	$ 20.00	$ 20.47	$ 40.47	$ -	$ -	$ -
BM82													0	$ 25.00	$ 27.07	$ 52.07	$ -	$ -	$ -
BMCULV													**0**	$ 225.00	$ -	$ 225.00	$ -	$ -	$ -
BMLOC													**0**	$ 80.00	$ -	$ 80.00	$ -	$ -	$ -
BMMAXCELL													**0**	$ 1.50	$ 11.80	$ 13.30	$ -	$ -	$ -
BM-SK													**0**	$ 1.50	$ 3.85	$ 5.35	$ -	$ -	$ -
BMWL													**0**	$ 35.00	$ 15.00	$ 50.00	$ -	$ -	$ -
BMWL(B)													**0**	$ 38.00	$ 20.00	$ 58.00	$ -	$ -	$ -
BMWM													**0**	$ 60.00	$ -	$ 60.00	$ -	$ -	$ -
UD(2-4")DB													**0**	$ 8.00	$ 8.06	$ 16.06	$ -	$ -	$ -
UD(4-4")DB													**0**	$ 12.00	$ 16.12	$ 28.12	$ -	$ -	$ -
PE1-2G(5/16"EHS)													**0**	$ 100.00	$ 28.01	$ 128.01	$ -	$ -	$ -
PF1-3(5/8"x7')													**0**	$ 150.00	$ 10.80	$ 160.80	$ -	$ -	$ -
PM2													**0**	$ 20.00	$ 23.88	$ 43.88	$ -	$ -	$ -
PM2A													**0**	$ 14.00	$ 5.16	$ 19.16	$ -	$ -	$ -
PM11													**0**	$ 10.00	$ 5.54	$ 15.54	$ -	$ -	$ -
PM92S													**0**	$ 50.00	$ 45.99	$ 95.99	$ -	$ -	$ -
PM92L													**0**	$ 75.00	$ 54.63	$ 129.63	$ -	$ -	$ -
SEBO4	360000	193650	138750	47850	94800	183900	222600	269550	318300	94650	259500	86400	**2269950**	$ 0.95	$ 0.23	$ 1.18	**$ 2,678,541.00**	$ 2,156,452.50	$ 522,088.50
SEAO4													**0**	$ 0.95	$ 0.23	$ 1.18	$ -	$ -	$ -
SEBO12													**0**	$ 0.95	$ 0.28	$ 1.23	$ -	$ -	$ -
SEAO12													**0**	$ 0.95	$ 0.28	$ 1.23	$ -	$ -	$ -
SUBSCRIBERS	2400	1291	925	319	632	1226	1484	1797	2122	631	1730	576	**15133**	$ -	$ -	$ -	$ -	$ -	$ -
NID	720	387	278	96	190	368	445	539	637	189	519	173	**4540**	$ 50.00	$ 446.00	$ 496.00	**$ 2,251,790.40**	$ 226,995.00	$ 2,024,795.40
NID HOUSING	720	387	278	96	190	368	445	539	637	189	519	173	**4540**	$ 50.00	$ 36.00	$ 86.00	**$ 390,431.40**	$ 226,995.00	$ 163,436.40
DROP SPLICE	720	387	278	96	190	368	445	539	637	189	519	173	4540	$ 75.00	$ -	$ 75.00	**$ 340,492.50**	$ 340,492.50	$ -
INSTALLS	1800	968	694	239	474	920	1113	1348	1592	473	1298	432	11350	$ 100.00	$ -	$ 100.00	**$ 1,134,975.00**	$ 1,134,975.00	$ -
HBFO FB12	755	569	688	259	373	608	558	710	1579	261	1039	290	7688	$ 104.50	$ 151.80	$ 256.30	**$ 1,970,492.71**	$ 803,416.95	$ 1,167,075.76

Warren County Estimate

																		Distribution Cost	
HBFO 144R-B6	189	142	172	65	93	152	139	177	395	65	260	73	1922	$ 182.88	$ 226.48	$ 409.36	**$ 786,803.14**	$ 351,504.53	$ 435,298.61
HBFO 288R-D	38	12	10	7	16	19	15	31	60	6	38	8	260	$ 209.00	$ 392.84	$ 601.84	**$ 156,237.61**	$ 54,256.40	$ 101,981.21
HBFO 864R-600	16	5	4	3	7	8	6	13	26	2	16	3	111	$ 209.00	$ 429.85	$ 638.85	**$ 71,076.75**	$ 23,252.74	$ 47,824.01
HBFO 144LT-B6													0	$ 182.88	$ 226.48	$ 409.36	$ -	$ -	$ -
HBFO 216LT-D													0	$ 209.00	$ 392.84	$ 601.84	$ -	$ -	$ -
TRAY R-B	1001	754	912	343	494	805	739	940	2092	345	1377	384	10187	$ -	$ 23.98	$ 23.98	**$ 244,267.80**	$ -	$ 244,267.80
TRAY LT-B													0	$ -	$ 15.25	$ 15.25	$ -	$ -	$ -
TRAY R-D/600	71	23	19	14	30	34	27	57	112	11	70	14	482	$ -	$ 35.96	$ 35.96	**$ 17,338.13**	$ -	$ 17,338.13
TRAY LT-D													0	$ -	$ 22.92	$ 22.92	$ -	$ -	$ -
HO-1	1116	756	384	300	444	864	876	612	732	216	1044	288	7632	$ 24.04	$ -	$ 24.04	**$ 183,473.28**	$ 183,473.28	$ -
HO-12	1015	512	332	184	219	600	685	1042	771	193	584	183	6320	$ 130.63	$ -	$ 130.63	**$ 825,581.60**	$ 825,581.60	$ -
Remote Building													0	$ -	$ 30,000.00	$ 30,000.00	$ -	$ -	$ -
RMT Cabinet													0	$ -	$ 20,000.00	$ 20,000.00	$ -	$ -	$ -
ECLE4201259-C7001B **Black**	24	12	9	5	7	12	14	20	14	6	17	5	145	$ -	$ 2,597.95	$ 2,597.95	**$ 376,702.75**	$ -	$ 376,702.75
LHSE420123C-81001B **White**													0	$ -	$ 2,970.34	$ 2,970.34	$ -	$ -	$ -
OSE-ST-3-TQ (Ribbon OSE Splice Trays)	24	12	9	5	7	12	14	20	14	6	17	5	145	$ -	$ 35.91	$ 35.91	**$ 5,206.95**	$ -	$ 5,206.95
OSE-ST-1 (Loose Tube Splice Trays)	0	0	0	0	0	0	0	0	0	0	0	0	0	$ -	$ 30.18	$ 30.18	$ -	$ -	$ -
CDF-ER-7A-19													0	$ -	$ 202.31	$ 202.31	$ -	$ -	$ -
CDF-IBU-7-6													0	$ -	$ 231.58	$ 231.58	$ -	$ -	$ -
02-001337-001													0	$ -	$ 11.55	$ 11.55	$ -	$ -	$ -
A0402798	24	12	9	5	7	12	14	20	14	6	17	5	145	$ -	$ 11.61	$ 11.61	**$ 1,683.45**	$ -	$ 1,683.45
OSE-CBL-35			1				1			1		2	5	$ -	$ 29.01	$ 29.01	**$ 145.05**	$ -	$ 145.05
OSE-CBL-36			2		2	1				1			6	$ -	$ 29.01	$ 29.01	**$ 174.06**	$ -	$ 174.06
OSE-CBL-37	1	1		1	1	1	1	1				2	9	$ -	$ 29.01	$ 29.01	**$ 261.09**	$ -	$ 261.09
OSE-CBL-38	1	3	2	1	1	1		2	4	2	3		20	$ -	$ 29.01	$ 29.01	**$ 580.20**	$ -	$ 580.20
OSE-CBL-39	3					1	2	2			1		9	$ -	$ 29.01	$ 29.01	**$ 261.09**	$ -	$ 261.09
OSE-HD0-W0-1													0	$ -	$ 967.71	$ 967.71	$ -	$ -	$ -
CDF-HUB-05													0	$ -	$ 20.82	$ 20.82	$ -	$ -	$ -
15-211-14	2	1	1	1	1	1	1	1	1	1	1	1	13	$ -	$ 77.67	$ 77.67	**$ 1,009.71**	$ -	$ 1,009.71
RBN-TERM-KIT-FMS	2	1	1	1	1	1	1	1	1	1	1	1	13	$ -	$ 85.01	$ 85.01	**$ 1,105.13**	$ -	$ 1,105.13
SCF-KT-HS2	4	3	2	1	1	2	2	4	4	1	4	0	28	$ -	$ 7.78	$ 7.78	**$ 217.84**	$ -	$ 217.84
LTC-END-01	4	3	2	1	1	2	2	4	4	1	4	0	28	$ -	$ 27.14	$ 27.14	**$ 759.92**	$ -	$ 759.92
COE Remote Material	$301,580.00	$216,492.00	$104,638.00	$66,586.00	$85,870.00	$123,578.00	$227,080.00	$266,494.00	$286,122.00	$85,864.00	$261,974.00	$84,488.00	$2,110,766.00	$ -	$ 2,110,766.00	$ 2,110,766.00	**$ 2,110,766.00**	$ -	$ 2,110,766.00
COE Annual Maintenance	$45,237.00	$32,473.80	$15,695.70	$9,987.90	$12,880.50	$18,536.70	$34,062.00	$39,974.10	$42,918.30	$12,879.60	$39,296.10	$12,673.20	$316,614.90	$ 173,530.50	$ 316,614.90	$ 490,145.40	**$ 490,145.40**	$ 173,530.50	$ 316,614.90
COE Installation Labor and Travel	$45,800.00	$20,280.00	$5,240.00	$5,240.00	$5,240.00	$5,240.00	$20,280.00	$30,760.00	$30,760.00	$5,240.00	$20,280.00	$5,240.00	$199,600.00	$ 199,600.00		$ 199,600.00	**$ 199,600.00**	$ 199,600.00	$ -
Option C - COE Internet/TV Backhaul (Annual)	$72,000.00												$72,000.00	$ 72,000.00		$ 72,000.00	**$ 72,000.00**	$ 72,000.00	$ -
Engineering - Inspection 5%														$ -	$ -	$ 1,643,488.83	**$ 1,643,488.83**	$ 1,643,488.83	$ -
																Grand Total	**$ 34,513,265.35**	$ 20,360,751.98	$ 14,152,513.37

Estimate Direct Bury

Warren County TOTAL BY REMOTE

Road Miles 873.94

Cable miles 997.23

Units	Warrenton Remote	Norlina Remote	Ray Jay RMT	Nut Bush RMT	Buchanon RMT	Lynch RMT	Lake Gaston Remote	Epworth Remote	Bugg Remote	Arcola RMT	Park Town Remote	Soul City RMT	Final No. of units	Labor	Materials	Labor & Materials	Revised Price with new unit totals	Labor	Material
30/6 Pole	4	6	5	1	2	4	1	7	5	1	6	0	**42**	$ 382.50	$ 107.00	$ 489.50	**$ 20,559.00**	$ 16,065.00	$ 4,494.00
BA3	264	199	241	91	131	213	195	248	553	91	364	102	**2691**	$ 30.00	$ 28.89	$ 58.89	**$ 158,465.34**	$ 80,726.11	$ 77,739.24
BDO5	755	569	688	259	373	608	558	710	1579	261	1039	290	**7688**	$ 80.00	$ 81.28	$ 161.28	**$ 1,239,952.98**	$ 615,056.04	$ 624,896.94
BDO7	189	142	172	65	93	152	139	177	395	65	260	73	**1922**	$ 120.00	$ 407.68	$ 527.68	**$ 1,014,227.41**	$ 230,646.02	$ 783,581.39
BFO12	98500	81650	57000	38100	47200	58200	39450	45700	106400	19600	115250	21300	**728350**	$ 1.10	$ 0.30	$ 1.40	**$ 1,019,690.00**	$ 801,185.00	$ 218,505.00
BFO24R	65200	69000	81050	30500	35400	88750	79200	118000	279350	23050	144650	34900	**1049050**	$ 1.10	$ 0.42	$ 1.52	**$ 1,594,556.00**	$ 1,153,955.00	$ 440,601.00
BFO48R	88400	55250	61100	13500	38550	66650	85700	78350	159500	48000	99300	21100	**815400**	$ 2.00	$ 0.56	$ 2.56	**$ 2,087,424.00**	$ 1,630,800.00	$ 456,624.00
BFO72R	59900	37800	81050	9750	14000	44500	31800	44300	131550	19300	70550	59450	**603950**	$ 2.00	$ 0.63	$ 2.63	**$ 1,588,388.50**	$ 1,207,900.00	$ 380,488.50
BFO96R	26650	14150	26000	14850	7300	9700	21050	23450	43650	0	20450	0	**207250**	$ 2.00	$ 0.88	$ 2.88	**$ 596,880.00**	$ 414,500.00	$ 182,380.00
BFO144R	38950	26500	37950	22850	44050	36050	21650	45050	69150	20300	69300	8300	**440100**	$ 2.00	$ 1.11	$ 3.11	**$ 1,368,711.78**	$ 880,200.50	$ 488,511.28
BFO216R	0	8550	9550	0	0	8550	35550	27000	30000	12350	46850	8950	**187350**	$ 2.00	$ 1.44	$ 3.44	**$ 644,484.00**	$ 374,700.00	$ 269,784.00
BFO288R	45700	20950	9450	15500	26200	10400	0	11550	42650	8000	36650	19400	**246450**	$ 2.00	$ 2.14	$ 4.14	**$ 1,020,303.00**	$ 492,900.00	$ 527,403.00
BFO432R	15400	5400	15600	2800	14500	14650	17850	23350	56850	6350	16100	0	**188850**	$ 2.00	$ 2.43	$ 4.43	**$ 836,605.50**	$ 377,700.00	$ 458,905.50
BFO576R	10500	4200	0	0	0	9250	0	13300	38200	0	28850	0	**104300**	$ 2.00	$ 3.24	$ 5.24	**$ 546,532.00**	$ 208,600.00	$ 337,932.00
BFO864R	24050	0	0	0	0	11950	19100	28200	13400	0	12700	0	**109400**	$ 2.00	$ 4.80	$ 6.80	**$ 743,920.00**	$ 218,800.00	$ 525,120.00
BFO144LT	31050	83400	70350	11350	29200	36300	13100	89400	120100	23200	77450	0	**584900**	$ 1.10	$ 1.11	$ 2.21	**$ 1,292,629.00**	$ 643,390.00	$ 649,239.00
BHF(36x72x36)	2	2	1	0	0	2	0	2	2	0	2	0	**13**	$ 555.00	$ 1,479.31	$ 2,034.31	**$ 26,446.03**	$ 7,215.00	$ 19,231.03
BHF(30x52x43)RD	72	70	60	17	40	52	49	110	172	29	125	16	**812**	$ 370.00	$ 576.20	$ 946.20	**$ 768,449.57**	$ 300,492.86	$ 467,956.71
BHF(22x36x18)	0	0	0	0	0	0	0	0	0	0	0	0	**0**	$ 168.00	$ 326.74	$ 494.74	$ -	$ -	$ -
BM2	1016	781	920	341	506	812	746	997	2146	354	1424	379	**10422**	$ 20.00	$ 23.88	$ 43.88	**$ 457,334.63**	$ 208,447.87	$ 248,886.76
BM6M	400	600	500	100	200	400	100	700	500	100	600	0	**4200**	$ 3.00	$ 1.00	$ 4.00	**$ 16,800.00**	$ 12,600.00	$ 4,200.00
BM53F	252	203	225	80	128	197	182	274	545	90	369	87	**2633**	$ 20.00	$ 38.52	$ 58.52	**$ 154,064.15**	$ 52,653.50	$ 101,410.65
BM60(1x2")PD	14198	9704	11363	4436	6816	10760	10541	13748	29121	4709	19820	5202	**140414**	$ 10.00	$ 1.00	$ 11.00	**$ 1,544,548.58**	$ 1,404,135.08	$ 140,413.51
BM60(2x2")PD	5664	5737	5898	1819	3148	4676	3907	7265	13310	2266	8930	1734	**64352**	$ 12.50	$ 2.00	$ 14.50	**$ 933,096.79**	$ 804,393.78	$ 128,703.01
BM60(3X2)PD	0	0	0	0	0	0	0	0	0	0	0	0	**0**	$ 16.00	$ 3.00	$ 19.00	$ -	$ -	$ -
BM60(1-4")PD	0	0	0	0	0	0	0	0	0	0	0	0	**0**	$ 16.00	$ 4.00	$ 20.00	$ -	$ -	$ -
BM60(2-4")PD	0	0	0	0	0	0	0	0	0	0	0	0	**0**	$ 20.00	$ 8.00	$ 28.00	$ -	$ -	$ -
BM60(3-4")PD	0	0	0	0	0	0	0	0	0	0	0	0	**0**	$ 20.00	$ 13.50	$ 33.50	$ -	$ -	$ -
BM71	10086	8137	8982	3184	5128	7899	7289	10953	21816	3603	14762	3468	**105307**	$ 9.00	$ -	$ 9.00	**$ 947,763.05**	$ 947,763.05	$ -
BM72	0	0	0	0	0	0	0	0	0	0	0	0	**0**	$ 15.00	$ -	$ 15.00	$ -	$ -	$ -
BM73	325	0	0	0	0	0	0	0	0	0	0	0	**325**	$ 18.00	$ -	$ 18.00	**$ 5,850.00**	$ 5,850.00	$ -
BM81	0	0	0	0	0	0	0	0	0	0	0	0	**0**	$ 20.00	$ 20.47	$ 40.47	$ -	$ -	$ -
BM82	12	18	15	3	6	12	3	21	15	3	18	0	**126**	$ 25.00	$ 27.07	$ 52.07	**$ 6,560.82**	$ 3,150.00	$ 3,410.82
BMCULV	0	0	0	0	0	0	0	0	0	0	0	0	**0**	$ 225.00	$ -	$ 225.00	$ -	$ -	$ -
BMLOC	0	0	0	0	0	0	0	0	0	0	0	0	**0**	$ 80.00	$ -	$ 80.00	$ -	$ -	$ -
BMMAXCELL	6600	0	0	0	0	0	0	0	0	0	0	0	**6600**	$ 1.50	$ 11.80	$ 13.30	**$ 87,780.00**	$ 9,900.00	$ 77,880.00
BM-SK	0	0	0	0	0	0	0	0	0	0	0	0	**0**	$ 1.50	$ 3.85	$ 5.35	$ -	$ -	$ -
BMWL	0	0	0	0	0	0	0	0	0	0	0	0	**0**	$ 35.00	$ 15.00	$ 50.00	$ -	$ -	$ -
BMWL(B)	0	0	0	0	0	0	0	0	0	0	0	0	**0**	$ 38.00	$ 20.00	$ 58.00	$ -	$ -	$ -
BMWM	0	0	0	0	0	0	0	0	0	0	0	0	**0**	$ 60.00	$ -	$ 60.00	$ -	$ -	$ -
UD(2-4")DB	6600	0	0	0	0	0	0	0	0	0	0	0	**6600**	$ 8.00	$ 8.06	$ 16.06	**$ 105,996.00**	$ 52,800.00	$ 53,196.00
UD(4-4")DB	0	0	0	0	0	0	0	0	0	0	0	0	**0**	$ 12.00	$ 16.12	$ 28.12	$ -	$ -	$ -
PE1-2G(5/16"EHS)	4	6	5	1	2	4	1	7	5	1	6	0	**42**	$ 100.00	$ 28.01	$ 128.01	**$ 5,376.42**	$ 4,200.00	$ 1,176.42
PF1-3(5/8"x7')	4	6	5	1	2	4	1	7	5	1	6	0	**42**	$ 150.00	$ 10.80	$ 160.80	**$ 6,753.60**	$ 6,300.00	$ 453.60
PM2	4	6	5	1	2	4	1	7	5	1	6	0	**42**	$ 20.00	$ 23.88	$ 43.88	**$ 1,842.96**	$ 840.00	$ 1,002.96
PM2A	0	0	0	0	0	0	0	0	0	0	0	0	**0**	$ 14.00	$ 5.16	$ 19.16	$ -	$ -	$ -
PM11	4	6	5	1	2	4	1	7	5	1	6	0	**42**	$ 10.00	$ 5.54	$ 15.54	**$ 652.68**	$ 420.00	$ 232.68
PM92S	0	0	0	0	0	0	0	0	0	0	0	0	**0**	$ 50.00	$ 45.99	$ 95.99	$ -	$ -	$ -
PM92L	2	3	3	1	1	2	1	4	3	1	3	0	**21**	$ 75.00	$ 54.63	$ 129.63	**$ 2,722.23**	$ 1,575.00	$ 1,147.23
SEBO4	360000	193650	138750	47850	94800	183900	222600	269550	318300	94650	259500	86400	**2269950**	$ 0.95	$ 0.23	$ 1.18	**$ 2,678,541.00**	$ 2,156,452.50	$ 522,088.50
SEAO4	0	0	0	0	0	0	0	0	0	0	0	0	**0**	$ 0.95	$ 0.23	$ 1.18	$ -	$ -	$ -
SEBO12	0	0	0	0	0	0	0	0	0	0	0	0	**0**	$ 0.95	$ 0.28	$ 1.23	$ -	$ -	$ -
SEAO12	0	0	0	0	0	0	0	0	0	0	0	0	**0**	$ 0.95	$ 0.28	$ 1.23	$ -	$ -	$ -
SUBSCRIBERS	2400	1291	925	319	632	1226	1484	1797	2122	631	1730	576	**15133**	$ -	$ -				
NID	720	387	278	96	190	368	445	539	637	189	519	173	**4540**	$ 50.00	$ 446.00	$ 496.00	**$ 2,251,790.40**	$ 226,995.00	$ 2,024,795.40
NID HOUSING	720	387	278	96	190	368	445	539	637	189	519	173	**4540**	$ 50.00	$ 36.00	$ 86.00	**$ 390,431.40**	$ 226,995.00	$ 163,436.40
Driveops	720	387	278	96	190	368	445	539	637	189	519	173	4540	$ 75.00	$ -	$ 75.00	**$ 340,492.50**	$ 340,492.50	$ -
HBFO FB12	755	569	688	259	373	608	558	710	1579	261	1039	290	7688	$ 104.50	$ 151.80	$ 256.30	**$ 1,970,492.71**	$ 803,416.95	$ 1,167,075.76
HBFO 144R-B6	189	142	172	65	93	152	139	177	395	65	260	73	1922	$ 182.88	$ 226.48	$ 409.36	**$ 786,803.14**	$ 351,504.53	$ 435,298.61
HBFO 288R-D	38	12	10	7	16	19	15	31	60	6	38	8	260	$ 209.00	$ 392.84	$ 601.84	**$ 156,237.61**	$ 54,256.40	$ 101,981.21

Warren County Estimate

																		Overall Cost	
HBFO 864R-600	16	5	4	3	7	8	6	13	26	2	16	3	111	$ 209.00	$ 429.85	$ 638.85	**$ 71,076.75**	$ 23,252.74	$ 47,824.01
HBFO 144LT-B6	0	0	0	0	0	0	0	0	0	0	0	0	0	$ 182.88	$ 226.48	$ 409.36	**$ -**	$ -	$ -
HBFO 216LT-D	18	48	40	6	17	21	7	51	69	13	44	0	334	$ 209.00	$ 392.84	$ 601.84	**$ 201,152.06**	$ 69,853.77	$ 131,298.29
TRAY R-B	1001	754	912	343	494	805	739	940	2092	345	1377	384	10187	$ -	$ 23.98	$ 23.98	**$ 244,267.80**	$ -	$ 244,267.80
TRAY LT-B	0	0	0	0	0	0	0	0	0	0	0	0	0	$ -	$ 15.25	$ 15.25	**$ -**	$ -	$ -
TRAY R-D/600	71	23	19	14	30	34	27	57	112	11	70	14	482	$ -	$ 35.96	$ 35.96	**$ 17,338.13**	$ -	$ 17,338.13
TRAY LT-D	23	62	52	8	22	27	10	66	89	17	58	0	434	$ -	$ 22.92	$ 22.92	**$ 9,958.41**	$ -	$ 9,958.41
HO-1	1692	1644	1248	444	732	1740	1020	2052	1884	360	1908	288	15012	$ 24.04	$ -	$ 24.04	**$ 360,888.48**	$ 360,888.48	$ -
HO-12	1015	512	332	184	219	600	685	1042	771	193	584	183	6320	$ 130.63	$ -	$ 130.63	**$ 825,581.60**	$ 825,581.60	$ -
Remote Building	1	1					1	1	1		1		6	$ -	$ 30,000.00	$ 30,000.00	**$ 180,000.00**	$ -	$ 180,000.00
RMT Cabinet			1	1	1	1				1		1	6	$ -	$ 20,000.00	$ 20,000.00	**$ 120,000.00**	$ -	$ 120,000.00
ECLE4201259-C7001B **Black**	24	12	9	5	7	12	14	20	14	6	17	5	145	$ -	$ 2,597.95	$ 2,597.95	**$ 376,702.75**	$ -	$ 376,702.75
LHSE420123C-81001B **White**	2	3	4	1	2	2	1	2	3	1	3	1	25	$ -	$ 2,970.34	$ 2,970.34	**$ 74,258.50**	$ -	$ 74,258.50
OSE-ST-3-TQ (Ribbon OSE Splice Trays)	24	12	9	5	7	12	14	20	14	6	17	5	145	$ -	$ 35.91	$ 35.91	**$ 5,206.95**	$ -	$ 5,206.95
OSE-ST-1 (Loose Tube Splice Trays)	8	12	16	4	8	8	4	8	12	4	12	4	100	$ -	$ 30.18	$ 30.18	**$ 3,018.00**	$ -	$ 3,018.00
CDF-ER-7A-19	4	3	3	3	3	3	3	3	3	3	3	3	37	$ -	$ 202.31	$ 202.31	**$ 7,485.47**	$ -	$ 7,485.47
CDF-IBU-7-6	6	5	5	5	5	5	5	5	5	5	5	5	61	$ -	$ 231.58	$ 231.58	**$ 14,126.38**	$ -	$ 14,126.38
02-001337-001	10	5	5	5	5	5	5	5	5	5	5	5	65	$ -	$ 11.55	$ 11.55	**$ 750.75**	$ -	$ 750.75
A0402798	26	15	13	6	9	14	15	22	17	7	20	6	170	$ -	$ 11.61	$ 11.61	**$ 1,973.70**	$ -	$ 1,973.70
OSE-CBL-35	0	0	1	0	0	0	1	0	0	1	0	2	5	$ -	$ 29.01	$ 29.01	**$ 145.05**	$ -	$ 145.05
OSE-CBL-36	2	3	6	1	4	3	1	2	3	2	3	1	31	$ -	$ 29.01	$ 29.01	**$ 899.31**	$ -	$ 899.31
OSE-CBL-37	1	1	0	1	1	1	1	1	0	0	0	2	9	$ -	$ 29.01	$ 29.01	**$ 261.09**	$ -	$ 261.09
OSE-CBL-38	1	3	2	1	1	1	0	2	4	2	3	0	20	$ -	$ 29.01	$ 29.01	**$ 580.20**	$ -	$ 580.20
OSE-CBL-39	3	0	0	0	0	1	2	2	0	0	1	0	9	$ -	$ 29.01	$ 29.01	**$ 261.09**	$ -	$ 261.09
OSE-HD0-W0-1	3	2	2	2	2	2	2	2	2	2	2	2	25	$ -	$ 967.71	$ 967.71	**$ 24,192.75**	$ -	$ 24,192.75
CDF-HUB-05	24	20	20	20	20	20	20	20	20	20	20	20	244	$ -	$ 20.82	$ 20.82	**$ 5,080.08**	$ -	$ 5,080.08
15-211-14	2	1	1	1	1	1	1	1	1	1	1	1	13	$ -	$ 77.67	$ 77.67	**$ 1,009.71**	$ -	$ 1,009.71
RBN-TERM-KIT-FMS	2	1	1	1	1	1	1	1	1	1	1	1	13	$ -	$ 85.01	$ 85.01	**$ 1,105.13**	$ -	$ 1,105.13
SCF-KT-HS2	4	3	2	1	1	2	2	4	4	1	4	0	28	$ -	$ 7.78	$ 7.78	**$ 217.84**	$ -	$ 217.84
LTC-END-01	4	3	2	1	1	2	2	4	4	1	4	0	28	$ -	$ 27.14	$ 27.14	**$ 759.92**	$ -	$ 759.92
COE Remote Material	$676,580.00	$216,492.00	$104,638.00	$66,586.00	$85,870.00	$123,578.00	$227,080.00	$266,494.00	$286,122.00	$85,864.00	$261,974.00	$84,488.00	$2,485,766.00		$ 2,485,766.00		**$ 2,485,766.00**	$ -	$ 2,485,766.00
COE Annual Maintenance	$116,487.00	$32,473.80	$15,695.70	$9,987.90	$12,880.50	$18,536.70	$34,062.00	$39,974.10	$42,918.30	$12,879.60	$39,296.10	$12,673.20	$387,864.90	$ 387,864.90			**$ 387,864.90**	$ 387,864.90	$ -
COE Installation Labor and Travel	$45,800.00	$20,280.00	$5,240.00	$5,240.00	$5,240.00	$5,240.00	$20,280.00	$30,760.00	$30,760.00	$5,240.00	$20,280.00	$5,240.00	$199,600.00	$ 199,600.00			**$ 199,600.00**	$ 199,600.00	$ -
Option C - COE Internet/TV Backhaul (Annual)	$172,000.00												$172,000.00	$ 172,000.00			**$ 172,000.00**	$ 172,000.00	$ -
Engineering - Inspection	$239,847.19	$134,719.85	$129,920.32	$49,321.34	$80,615.19	$130,110.91	$136,640.43	$192,712.83	$318,001.36	$61,760.35	$227,939.92	$59,094.49	$1,760,684.18	$ 1,760,684.18	$ -		**$ 1,760,684.18**	$ 1,760,684.18	$ -

Grand Total	**$ 36,974,367.74**
Transport ONLY	$ 4,318,033.17
Distribution Cost	$ 34,513,265.35
Total	$ 38,831,298.51
Difference	$ (1,856,930.78)

$	21,129,698.34

$	15,844,669.39

Warrenton Remote	$	3,786,076.78	
Norlina Remote	$	2,425,151.16	
Ray Jay RMT	$	2,472,832.65	
Nut Bush RMT	$	904,612.86	
Buchanon RMT	$	1,508,313.25	
Lynch RMT	$	2,454,863.53	
Lake Gaston Remote	$	2,451,386.70	
Epworth Remote	$	3,517,028.41	
Bugg Remote	$	6,000,226.90	
Arcola RMT	$	1,131,223.50	
Park Town Remote	$	4,237,248.23	
Soul City RMT	$	1,079,488.70	
Subtotal	$	31,968,452.66	
	$	5,005,915.08	Maintance, Inspections, Backhaul
Total Cost	$	36,974,367.74	

Estimate Direct Bury

Warren County DISTRIBUTION ONLY

Road Miles																	
Cable miles	#REF!																
Units	Warrenton Remote	Norlina Remote	Ray Jay RMT	Nut Bush RMT	Buchanon RMT	Lynch RMT	Lake Gaston Remote	Epworth Remote	Bugg Remote	Arcola RMT	Park Town Remote	Soul City RMT	Final No. of units	Labor	Materials	Labor & Materials	Revised Price with new unit totals
ECLE4201259-C7001B **Black**	24	12	9	5	7	12	14	20	14	6	17	5	145	$ -	$ 2,597.95	$ 2,597.95	**$ 376,702.75**
LHSE420123C-81001B **White**	2	3	4	1	2	2	1	2	3	1	3	1	25	$ -	$ 2,970.34	$ 2,970.34	**$ 74,258.50**
OSE-ST-3-TQ (Ribbon OSE Splice Trays)	24	12	9	5	7	12	14	20	14	6	17	5	145	$ -	$ 35.91	$ 35.91	**$ 5,206.95**
OSE-ST-1 (Loose Tube Splice Trays)	8	12	16	4	8	8	4	8	12	4	12	4	100	$ -	$ 30.18	$ 30.18	**$ 3,018.00**
CDF-ER-7A-19	4	3	3	3	3	3	3	3	3	3	3	3	37	$ -	$ 202.31	$ 202.31	**$ 7,485.47**
CDF-IBU-7-6	6	5	5	5	5	5	5	5	5	5	5	5	61	$ -	$ 231.58	$ 231.58	**$ 14,126.38**
02-001337-001	10	5	5	5	5	5	5	5	5	5	5	5	65	$ -	$ 11.55	$ 11.55	**$ 750.75**
A0402798	26	15	13	6	9	14	15	22	17	7	20	6	170	$ -	$ 11.61	$ 11.61	**$ 1,973.70**
OSE-CBL-35			1				1			1		2	5	$ -	$ 29.01	$ 29.01	**$ 145.05**
OSE-CBL-36	2	3	6	1	4	3	1	2	3	2	3	1	31	$ -	$ 29.01	$ 29.01	**$ 899.31**
OSE-CBL-37	1	1		1	1	1	1	1				2	9	$ -	$ 29.01	$ 29.01	**$ 261.09**
OSE-CBL-38	1	3	2	1	1	1		2	4	2	3		20	$ -	$ 29.01	$ 29.01	**$ 580.20**
OSE-CBL-39	3					1	2	2			1		9	$ -	$ 29.01	$ 29.01	**$ 261.09**
OSE-HD0-W0-1	3	2	2	2	2	2	2	2	2	2	2	2	25	$ -	$ 967.71	$ 967.71	**$ 24,192.75**
CDF-HUB-05	24	20	20	20	20	20	20	20	20	20	20	20	244	$ -	$ 20.82	$ 20.82	**$ 5,080.08**
15-211-14	2	1	1	1	1	1	1	1	1	1	1	1	13	$ -	$ 77.67	$ 77.67	**$ 1,009.71**
RBN-TERM-KIT-FMS	2	1	1	1	1	1	1	1	1	1	1	1	13	$ -	$ 85.01	$ 85.01	**$ 1,105.13**
SCF-KT-HS2	4	3	2	1	1	2	2	4	4	1	4	0	28	$ -	$ 7.78	$ 7.78	**$ 217.84**
LTC-END-01	4	3	2	1	1	2	2	4	4	1	4	0	28	$ -	$ 27.14	$ 27.14	**$ 759.92**
																	$ 518,034.67

Access Equipment

E7-20 Option (Larger Remotes)

E7-20 Chassis	2100
E7-20 GE-24x Card	2800
E7-20 SCP2	7000
10 GbE SFP+ WAN	2000
BiDi Optics Downstream	160
Jumpers (CO Transport)	15
CO Jumpers (1 per customer)	6

E7-2 Option (Smaller Remotes)

E7-2 Chassis	700
E7-2 GE-24 Card	5000
10 GbE SFP+ WAN	2000
BiDi Optics Downstream	160
Jumpers (CO Transport)	15
CO Jumpers (1 per customer)	6

Transport and Switching Equipment

BTI WDM ETS	50000
Brocade Router	150000
Metaswitch	175000

Power Plant and Environmental

Batteries (3 strings)	10000
Rectifier	17000
Inverter	45000
Generator	30000
Ironwork	4200
Fuse Panels	500
Cable Management	1200
HVAC	7500

Digital TV

Encoders for off air or Skitter	100000

Travel

Hotel (Daily)	125
Per Diem (Daily)	55

Labor

Per Hour Per Employee	65

Ironwork, OSE, and Power Installation

2 employees 10 days

Per diem	1100

Hotel (10 days 2 employees)	2500
Labor	10400
Travel Time	1040

Calix Installation and Testing

2 employees 3 days

Per diem	330
Hotel (3 days 2 employees)	750
Labor	3120
Travel Time	1040

Router Installation and Testing

2 employees 3 days

Per diem	330
Hotel (3 days 2 employees)	750
Labor	3120
Travel Time	1040

WDM/ETS Installation and Testing

2 employees 3 days

Per diem	330
Hotel (3 days 2 employees)	750
Labor	3120
Travel Time	1040

Softswitch Installation and Testing

2 employees 10 days

Per diem	1100
Hotel (10 days 2 employees)	2500
Labor	10400
Travel Time	1040

Estimate Direct Bury

Warren County Spur to Towers Cost

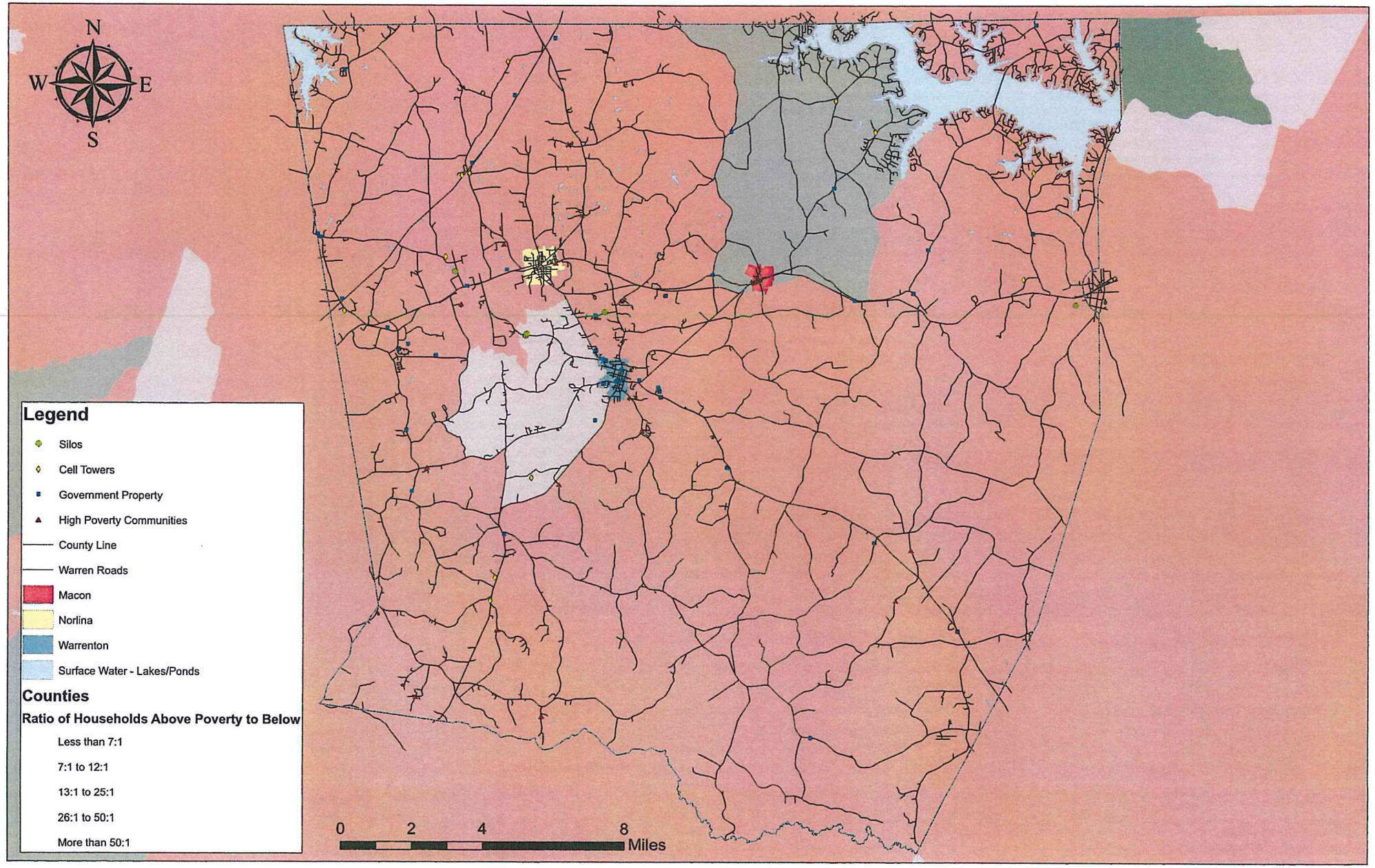
Cable miles	8.56	5.31	0.53	0.53	0.70	6.06	6.46	11.29	5.25	2.03	0.53	47.24					Labor	Material
Units	ASR # 1268034 Bugg	ASR # 1265578 Arcola	1238889 Radio Training	ASR # 1289318 American	ASR # 1004804 Epworth	ASR # 1008958 American	ASR # 1291502 Crown Castle	ASR # 1004598 Bugg	ASR # 1281099 NC Hwy Patrol	Water Tower #6 Epworth	Pole Option #12	Final No. of units	Labor	Materials	Labor & Materials	Revised Price with new unit totals		
30/6 Pole												0	$ 382.50	$ 107.00	$ 489.50	$ -	$ -	$ -
BA3	18	5	2	2	3	12	14	15	5	7	2	85	$ 30.00	$ 28.89	$ 58.89	$ 4,985.92	$ 2,539.95	$ 2,445.97
BDO5	50	14	6	6	7	34	40	42	16	21	6	242	$ 80.00	$ 81.28	$ 161.28	$ 39,013.63	$ 19,352.00	$ 19,661.63
BDO7	13	3	1	1	2	9	10	11	4	5	1	60	$ 120.00	$ 407.68	$ 527.68	$ 31,911.45	$ 7,257.00	$ 24,654.45
BFO12	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	11000	$ 1.10	$ 0.30	$ 1.40	$ 15,400.00	$ 12,100.00	$ 3,300.00
BFO24R			1800	1800		16200	19100	20000			1800	60700	$ 1.10	$ 0.42	$ 1.52	$ 92,264.00	$ 66,770.00	$ 25,494.00
BFO48R		2100							6800			8900	$ 2.00	$ 0.56	$ 2.56	$ 22,784.00	$ 17,800.00	$ 4,984.00
BFO72R		3750			2700							6450	$ 2.00	$ 0.63	$ 2.63	$ 16,963.50	$ 12,900.00	$ 4,063.50
BFO96R	13500											13500	$ 2.00	$ 0.88	$ 2.88	$ 38,880.00	$ 27,000.00	$ 11,880.00
BFO144R	10700									9700		20400	$ 2.00	$ 1.11	$ 3.11	$ 63,444.00	$ 40,800.00	$ 22,644.00
BFO216R	20000											20000	$ 2.00	$ 1.44	$ 3.44	$ 68,800.00	$ 40,000.00	$ 28,800.00
BFO288R		6300						12600	5300			24200	$ 2.00	$ 2.14	$ 4.14	$ 100,188.00	$ 48,400.00	$ 51,788.00
BFO432R								26000				26000	$ 2.00	$ 2.43	$ 4.43	$ 115,180.00	$ 52,000.00	$ 63,180.00
BFO576R						14800	14000					28800	$ 2.00	$ 3.24	$ 5.24	$ 150,912.00	$ 57,600.00	$ 93,312.00
BFO864R									14600			14600	$ 2.00	$ 4.80	$ 6.80	$ 99,280.00	$ 29,200.00	$ 70,080.00
BFO144LT		14900										14900	$ 1.10	$ 1.11	$ 2.21	$ 32,929.00	$ 16,390.00	$ 16,539.00
BHF(36x72x36)												0	$ 555.00	$ 1,479.31	$ 2,034.31	$ -	$ -	$ -
BHF(30x52x43)RD	12	13	1	1	1	9	9	23	12	1	1	84	$ 370.00	$ 576.20	$ 946.20	$ 79,886.31	$ 31,238.57	$ 48,647.74
BHF(22x36x18)												0	$ 168.00	$ 326.74	$ 494.74	$ -	$ -	$ -
BM2	75	30	8	8	10	52	59	76	32	28	8	387	$ 20.00	$ 23.88	$ 43.88	$ 16,972.94	$ 7,736.07	$ 9,236.87
BM6M												0	$ 3.00	$ 1.00	$ 4.00	$ -	$ -	$ -
BM53F	23	14	1	1	2	16	17	30	14	5	1	125	$ 20.00	$ 38.52	$ 58.52	$ 7,298.91	$ 2,494.50	$ 4,804.41
BM60(1x2")PD												0	$ 10.00	$ 1.00	$ 11.00	$ -	$ -	$ -
BM60(2x2")PD	1356	395	84	84	111	960	1023	1788	831	321	84	7037	$ 12.50	$ 2.00	$ 14.50	$ 102,029.25	$ 87,956.25	$ 14,073.00
BM60(3X2)PD												0	$ 16.00	$ 3.00	$ 19.00	$ -	$ -	$ -
BM60(1-4")PD												0	$ 16.00	$ 4.00	$ 20.00	$ -	$ -	$ -
BM60(2-4")PD												0	$ 20.00	$ 8.00	$ 28.00	$ -	$ -	$ -
BM60(3-4")PD												0	$ 20.00	$ 13.50	$ 33.50	$ -	$ -	$ -
BM71	0	298	0	0	0	0	0	0	0	0	0	298	$ 9.00	$ -	$ 9.00	$ 2,682.00	$ 2,682.00	$ -
BM72												0	$ 15.00	$ -	$ 15.00	$ -	$ -	$ -
BM73												0	$ 18.00	$ -	$ 18.00	$ -	$ -	$ -
BM81												0	$ 20.00	$ 20.47	$ 40.47	$ -	$ -	$ -
BM82	0	0	0	0	0	0	0	0	0	0	0	0	$ 25.00	$ 27.07	$ 52.07	$ -	$ -	$ -
BMCULV												0	$ 225.00	$ -	$ 225.00	$ -	$ -	$ -
BMLOC												0	$ 80.00	$ -	$ 80.00	$ -	$ -	$ -
BMMAXCELL												0	$ 1.50	$ 11.80	$ 13.30	$ -	$ -	$ -
BM-SK												0	$ 1.50	$ 3.85	$ 5.35	$ -	$ -	$ -
BMWL												0	$ 35.00	$ 15.00	$ 50.00	$ -	$ -	$ -
BMWL(B)												0	$ 38.00	$ 20.00	$ 58.00	$ -	$ -	$ -
BMWM												0	$ 60.00	$ -	$ 60.00	$ -	$ -	$ -
UD(2-4")DB												0	$ 8.00	$ 8.06	$ 16.06	$ -	$ -	$ -
UD(4-4")DB												0	$ 12.00	$ 16.12	$ 28.12	$ -	$ -	$ -
PE1-2G(5/16"EHS)	0	0	0	0	0	0	0	0	0	0	0	0	$ 100.00	$ 28.01	$ 128.01	$ -	$ -	$ -
PF1-3(5/8"x7')	0	0	0	0	0	0	0	0	0	0	0	0	$ 150.00	$ 10.80	$ 160.80	$ -	$ -	$ -
PM2	0	0	0	0	0	0	0	0	0	0	0	0	$ 20.00	$ 23.88	$ 43.88	$ -	$ -	$ -
PM2A												0	$ 14.00	$ 5.16	$ 19.16	$ -	$ -	$ -
PM11	0	0	0	0	0	0	0	0	0	0	0	0	$ 10.00	$ 5.54	$ 15.54	$ -	$ -	$ -
PM92S												0	$ 50.00	$ 45.99	$ 95.99	$ -	$ -	$ -
PM92L	0	0	0	0	0	0	0	0	0	0	0	0	$ 75.00	$ 54.63	$ 129.63	$ -	$ -	$ -
SEBO4	11250	9000	0	0	0	8700	6900	12300	21150	3300	0	72600	$ 0.95	$ 0.23	$ 1.18	$ 85,668.00	$ 68,970.00	$ 16,698.00
SEAO4												0	$ 0.95	$ 0.23	$ 1.18	$ -	$ -	$ -
SEBO12												0	$ 0.95	$ 0.28	$ 1.23	$ -	$ -	$ -
SEAO12												0	$ 0.95	$ 0.28	$ 1.23	$ -	$ -	$ -
SUBSCRIBERS	75	60				58	46	82	141	22		484						
NID	23	18	0	0	0	17	14	25	42	7	0	145	$ 50.00	$ 446.00	$ 496.00	$ 72,019.20	$ 7,260.00	$ 64,759.20
NID HOUSING	23	18	0	0	0	17	14	25	42	7	0	145	$ 50.00	$ 36.00	$ 86.00	$ 12,487.20	$ 7,260.00	$ 5,227.20
DROP SPLICE	23	18	0	0	0	17	14	25	42	7	0	145	$ 75.00	$ -	$ 75.00	$ 10,890.00	$ 10,890.00	$ -
INSTALLS	56	45	0	0	0	44	35	62	106	17	0	363	$ 100.00		$ 100.00	$ 36,300.00	$ 36,300.00	$ -
HBFO FB12	50	14	6	6	7	34	40	42	16	21	6	242	$ 104.50	$ 151.80	$ 256.30	$ 61,999.19	$ 25,278.55	$ 36,720.64

Warren County Estimate

																	Spur to Towers Cost	
HBFO 144R-B6	13	3	1	1	2	9	10	11	4	5	1	**61**	$ 182.88	$ 226.48	$ 409.36	**$ 24,817.22**	$ 11,087.10	$ 13,730.12
HBFO 288R-D	0	3	0	0	0	6	6	15	8	0	0	**37**	$ 209.00	$ 392.84	$ 601.84	**$ 22,532.88**	$ 7,824.96	$ 14,707.92
HBFO 864R-600	0	1	0	0	0	3	2	7	3	0	0	**16**	$ 209.00	$ 429.85	$ 638.85	**$ 10,250.82**	$ 3,353.55	$ 6,897.27
HBFO 144LT-B6		10										**10**	$ 182.88	$ 226.48	$ 409.36	**$ 6,568.41**	$ 2,934.44	$ 3,633.97
HBFO 216LT-D	0	9	0	0	0	0	0	0	0	0	0	**9**	$ 209.00	$ 392.84	$ 601.84	**$ 5,124.24**	$ 1,779.49	$ 3,344.75
TRAY R-B	67	18	7	7	10	46	53	56	21	28	7	**321**	$ -	$ 23.98	$ 23.98	**$ 7,690.27**	$ -	$ 7,690.27
TRAY LT-B		16										**16**	$ -	$ 15.25	$ 15.25	**$ 243.96**	$ -	$ 243.96
TRAY R-D/600	0	5	0	0	0	11	10	29	15	0	0	**70**	$ -	$ 35.96	$ 35.96	**$ 2,500.54**	$ -	$ 2,500.54
TRAY LT-D	0	11	0	0	0	0	0	0	0	0	0	**11**	$ -	$ 22.92	$ 22.92	**$ 253.69**	$ -	$ 253.69
HO-1	24	312	0	0	24	24	24	24	24	24	0	**480**	$ 24.04	$ -	$ 24.04	**$ 11,539.20**	$ 11,539.20	$ -
HO-12	64	34	4	4	6	108	112	168	172	12	4	**688**	$ 130.63	$ -	$ 130.63	**$ 89,873.44**	$ 89,873.44	$ -
Engineering Cost																**$ 78,128.16**		

Grand Total	**$ 1,640,691.32**	$ 866,567.07	$ 695,996.09

Section 10


N
W
E
S
Legend
Silos
Cell Towers
Government Property
High Poverty Communities
County Line
Warren Roads
Macon
Norlina
Warrenton
Surface Water - Lakes/Ponds
Counties
Ratio of Households Above Poverty to Below
Less than 7:1
7:1 to 12:1
13:1 to 25:1
26:1 to 50:1
More than 50:1
0
2
4
8
Miles

Warren County Locations

March 2018

ADDRESS	COMMUNITY	DESCRIPTION	LATITUDE °	LONGITUDE °
Government Propery				
109 S MAIN ST	WARRENTON	COURTHOUSE	36.398347	-78.155923
105 S FRONT ST	WARRENTON	HENDRIX BUILDING	36.398379	-78.15642
117 S MAIN ST	WARRENTON	TAX OFFICES	36.398112	-78.15596
132 RAFTERS LN	WARRENTON	WARREN COUNTY SHERIFF'S OFFICE	36.393314	-78.134926
128 RAFTERS LN	WARRENTON	WARREN COUNTY JAIL	36.393717	-78.134805
142 RAFTERS LN	WARRENTON	ANIMAL SHELTER	36.394775	-78.135333
158 RAFTERS LN	WARRENTON	COOPERATIVE EXTENSION	36.395436	-78.135646
307 N MAIN ST	WARRENTON	JOHN GRAHAM CENTER-DEPT OF SOCIAL SERVICES	36.402713	-78.154124
538 W RIDGEWAY ST	WARRENTON	LOAVES AND FISHES	36.406336	-78.16182
540 W RIDGEWAY ST	WARRENTON	EMS BUILDING	36.406318	-78.162243
544 W RIDGEWAY ST	WARRENTON	HEALTH DEPARTMENT	36.406605	-78.163101
602 W RIDGEWAY ST	WARRENTON	COUNTY MANAGER BUILDING	36.407092	-78.163936
548 W RIDGEWAY ST	WARRENTON	FINANCE OFFICE	36.407235	-78.163489
712 US HIGHWAY 158 BUS W	WARRENTON	PUBLIC UTILITIES OFFICE	36.410202	-78.167131
710 US HIGHWAY 158 BUS W	WARRENTON	BLUEPRINT BLDG - HOUSEKEEPING	36.410529	-78.166575
501 US HIGHWAY 158 BUS E	WARRENTON	ARMORY	36.398288	-78.14511
738 US HIGHWAY 401 S	WARRENTON	WASTE AND WATER TREATMENT PLANT	36.381849	-78.167551
252 DUKE DR	NORLINA	POOL HOUSE	36.411622	-78.266565
119 S FRONT ST	WARRENTON	MEMORIAL LIBRARY	36.397705	-78.157181
427 W FRANKLIN ST	WARRENTON	HAWKINS CAFE BUILDING	36.396888	-78.162997
427 W FRANKLIN ST	WARRENTON	SENIOR CITIZEN BUILDING	36.396963	-78.16338
1945 US HIGHWAY 401 S	WARRENTON	EMS BUILDING	36.335303	-78.213709
370 DAVIS BUGG RD	MACON	EMS BUILDING	36.330719	-78.026763
840 US HIGHWAY 158 BYP	WARRENTON	RECREATION BUILDING	36.432864	-78.131337
538 W RIDGEWAY ST	WARRENTON	EMS BUILDING	36.406336	-78.16182
548 W RIDGEWAY ST	WARRENTON	WARREN COUNTY MENTAL HEALTH CLINIC	36.407235	-78.163489
105 BLUE MUD SWAMP RD	NORLINA	OINE WATER TOWER	36.48375	-78.230013
146 CRESCENT DR	NORLINA	COUNTY DUMP	36.41357	-78.261898
268 COOL SPRINGS SCHOOL RD	NORLINA	AXTELL WATER TOWER	36.353246	-78.260308
110 FIREFIGHTER DR	MANSON	DREWRY WATER TOWER	36.459212	-78.307055
304 ELAMS RD	LITTLETON	ELAMS WATER TOWER	36.54217	-77.942152
1034 NC HIGHWAY 58	WARRENTON	LIBERIA WATER TOWER	36.362076	-78.100893
268 US HIGHWAY 1 S	NORLINA	NORLINA WATER TOWER	36.444118	-78.211573

Warren County Locations

March 2018

517 BEEF TONGUE RD	MACON	MACON WATER TOWER	36.441316	-78.107481
223 EATON FERRY RD	MACON	VAUGHN WATER TOWER	36.43288	-78.005902
1251 US HIGHWAY 1	HENDERSON	SOUL CITY WATER TOWER	36.420376	-78.272233
KING STREET	WARRENTON	KING STREET WATER TOWER	36.388056	-78.158056
NORTH MAIN ST	WARRENTON	MAIN STREET WATER TOWER	36.408514	-78.15445
FAIRLANE DR	WARRENTON	WARRENTON WATER TOWER	36.403761	-78.162258
185 E MACON ST	WARRENTON	OLD JAIL	36.398011	-78.154055
268 NC HIGHWAY 58	WARRENTON	NC HWY 58 PUMP STATION	36.391243	-78.13411
403 MANSON AXTELL RD	NORLINA	AXTELL BOOSTER PUMP STATION	36.378349	-78.262911
602 US HIGHWAY 1 S	NORLINA	RIDGEWAY PUMP STATION	36.437428	-78.23181
885 LIZARD CREEK RD	LITTLETON	ROANOKE BOOSTER PUMP STATION	36.533962	-77.901135
2375 US HIGHWAY 158 E	MACON	VAUGHAN BOOSTER PUMP STATION	36.430191	-78.035637
2084 NC HIGHWAY 43	WARRENTON	ARCOLA PRV	36.293883	-77.984895
844 CHURCH HILL RD	MACON	CHURCH HILL PRV	36.476521	-78.045422
258 CONNELL RD	WARRENTON	CONNELL ROAD MASTER METER	36.425064	-78.16706
854 MANSON DREWRY RD	MANSON	DREWRY PRV	36.457992	-78.30554
591 EATON FERRY RD	MACON	EATON FERRY ROAD PRV	36.450778	-77.998013
170 RICHARDSON RD	WARRENTON	FORK CHAPEL PRV	36.250878	-78.059451
701 PEARL HARBOR RD	LITTLETON	PLEASANT ZION PRV	36.456992	-77.945056
1119 WISE FIVE FORKS RD	WARRENTON	OAKVILLE PRV	36.499968	-78.097372
1006 OINE RD	NORLINA	OINE SEWER LIFT STATION	36.488021	-78.228749
231 I85	NORLINA	NC DOT I85 WELCOME CENTER SEWER LIFT STATION	36.515351	-78.206898
2552 US HIGHWAY 1 N	NORLINA	WISE SEWER LIFT STATION	36.538414	-78.186132
368 MANSON DREWRY RD	MANSON	MANSON LIFT STATION	36.432469	-78.294906
324 LIBERATION RD	NORLINA	HERITAGE BREEDERS SEWER LIFT STATION	36.409017	-78.247746
129 NUT BUSH DR	MANSON	PLEASANT HILL SEWER LIFT STATION	36.526258	-78.292705
139 HYCO STREET	NORLINA	NORLINA TOWN HALL	36.445761	-78.194672
133 S. MAIN STREET	WARRENTON	WARRENTON TOWN HALL	36.397514	-78.155819
2357 EATON FERRY ROAD	LAKE GASTON	LAKE GASTON CHAMBER OF COMMERCE	36.531361	-77.945317
130 N. MAIN STREET	WARRENTON	WARREN CO. CHAMBER OF COMMERCE	36.399519	-78.154619
501 US HWY 158 BUS EAST	WARRENTON	WARREN CO. ECONOMIC DEVELOPMENT COMM	36.398317	-78.145253
236 SOUTH MAIN ST	WARRENTON	WARRENTON RURAL FIRE DEPT	36.395542	-78.155867
2169 NC HWY 43	WARRENTON	ARCOLA RURAL VFD	36.290211	-77.981872
2588 NC HWY 58	WARRENTON	INEZ FIRE DEPT	36.278206	-78.097622
102 CENTER ST	NORLINA	NORLINA FIRE DEPT	36.445558	-78.195722

Warren County Locations

March 2018

1720 US 1	NORLINA	WISE HAWTREE FIRE DEPT	36.488578	-78.170706
619 MARTIN LUTHER KING JR BLVD	WARRENTON	NCDOT HIGHWAY DEPT GARAGE	36.395156	-78.173536
602 W. RIDGEWAY ST	WARRENTON	WARREN CO MANAGER'S OFFICE	36.407214	-78.163492
720 W. RIDGEWAY ST	WARRENTON	WARREN CO CODE ENFORCEMENT ZONING/PLANNING	36.406689	-78.1632
1402 US HWY 1 S	MANSON	MANSON POST OFFICE	36.422008	-78.282472
143 N MAIN ST	WARRENTON	WARRENTON POST OFFICE	36.400064	-78.155011
306 LIBERTY ST	NORLINA	NORLINA POST OFFICE	36.444692	-78.193606
1728 US 1	WISE	WISE POST OFFICE	36.488781	-78.171078
1608 US HWY 158 E	MACON	MACON POST OFFICE	36.438028	-78.085392
686 US HWY 1 S	RIDGEWAY	RIDGEWAY POST OFFICE	36.435894	-78.237019
379 COLLINS ROAD	MANSON	WARREN CO CORRECTIONAL INSTITUTION	36.417522	-78.270997
Cell Towers				
1501 CHURCH HILL RD	MACON	VERIZON WIRELESS	36.512067	-78.044011
392 RIDGEWAY DRWERY RD	NORLINA	SBA TOWERS INC	36.449393	-78.242405
563 HUBQUARTER RD	MACON	AMERICAN TOWER CORP	36.499188	-78.024138
337 BOYD FARM RD	WARRENTON	CROWN CASTLE	36.358547	-78.199841
121 RACHEL RD	LITTLETON	AMERICAN TOWER CORP/AT&T	36.482151	-77.944295
	NORLINA	AMERICAN TOWER CORP	36.529071	-78.210242
200 JOHN SKINNER RD	LITTLETON	AMERICAN TOWER CORP/VERIZON	36.438289	-77.950037
279 MANSON DREWRY RD	MANSON	SBA STRUCTURES LLC/VERIZON WIRELESS	36.427388	-78.293826
132 FOREST HILL DR	LITTLETON	TIME WARNER CABLE	36.494368	-77.951244
2268 US HIGHWAY 401 S	NORLINA	U.S. CELLULAR CORP	36.317566	-78.21847
167 MEADOWS RD	NORLINA	U.S. CELLULAR CORP	36.482944	-78.233812
2456 US HIGHWAY 401	NORLINA	AMERICAN TOWER CORP	36.308041	-78.220956
105 BLUE MUD SWAMP RD	NORLINA	VERIZON WIRELESS	36.48375	-78.230013
824 US HIGHWAY 158 BUSINESS WEST	WARRENTON	WARR AM1520	36.415853	-78.170808
High Poverty Areas				
STAINBACK RD	NORLINA	OINE ROAD TRAILER PARK	36.454572	-78.213029
CONNELL RD/CRESTWOOD RD	WARRENTON	CONNELL ROAD TRAILER PARK	36.424924	-78.166905
FERGUSON DR	WARRENTON	F & M TRAILER PARK	36.377804	-78.14395
REDMAN TRL	WARRENTON	RED MAN'S TRAIL NEIGHBORHOOD	36.306741	-78.016251
EVANS LN	NORLINA	THE PINES APARTMENTS	36.43011	-78.234954
HEARTLAND LN	NORLINA	WISE TRAILER PARK	36.495375	-78.18032

Warren County Locations

March 2018

HESTER RD/ENCHANTED FOREST DR/HADDAD DR	WARRENTON	HESTER ROAD TRAILERS	36.43077	-78.154403
LOBLOLLY DR	WARRENTON	LOBLOLLY ROAD HOMES	36.36305	-78.252654
BLUE GRASS DR	WARRENTON	BLUEGRASS MOUNTAIN	36.295989	-78.217496
HIDDEN CREEK LN	WARRENTON	BRICKYARD RUN	36.260391	-78.19524
SUMMIT RD	HENDERSON	PIM'S HILL	36.268782	-78.258922
LIMER TOWN RD	WARRENTON	LIMER TOWN TRAILERS	36.355657	-78.186065
COUNTRY LN	NORLINA	WARREN PLAINS RD APARTMENTS	36.446671	-78.18693
GROVE HILL RD	MACON	GROVE HILL	36.32736	-78.008145
Agricultural Structures/Silos				
219 RIDGEWAY DREWRY RD	NORLINA	SILO (POSSIBLY SMALL)	36.443392	-78.237695
182 CONNELL RD	WARRENTON	SILO	36.426244	-78.162029
709 RIDGEWAY WARRENTON RD	NORLINA	SILO	36.416721	-78.202172
702 RIDGEWAY WARRENTON RD	NORLINA	SILO	36.417522	-78.201649
4082 US HIGHWAY 158 E	LITTLETON	MULTIPLE SILOS (MAY BE SMALLER)	36.427526	-77.923782
Schools				
203 COUSIN LUCY'S LANE	WARRENTON	MARIAM BOYD ELEMENTARY	36.394919	-78.158536
216 SHOCCO SPRINGS ROAD	WARRENTON	SOUTH WARREN ELEMENTARY	36.3197	-78.199361
2936 US HWY 158 EAST	MACON	VAUGHAN ELEMENTARY	36.421647	-77.999178
164 ELEMENTARY AVENUE	NORLINA	NORTHSIDE K-8	36.456556	-78.184725
149 CAMPUS DRIVE	WARRENTON	WARREN COUNTY HIGH SCHOOL	36.432492	-78.165267
118 CAMPUS DRIVE	WARRENTON	WARREN COUNTY MIDDLE SCHOOL	36.431253	-78.170917
210 RIDGEWAY STREET	WARRENTON	WARREN EARLY COLLEGE HIGH SCHOOL	36.431747	-78.173358
201 HARMON STREET	NORLINA	NORLINA CHRISTIAN SCHOOL	36.448561	-78.195906
Electric Co-ops				
1878 US 158	MACON	HALIFAX ELECTRIC UTILITY CO	36.440536	-78.067167

Section 11

Specifications and Descriptions for Construction of Direct Buried Plant

Section BDO – BURIED PLANT FIBER OPTIC HOUSING ASSEMBLY UNITS

This unit consists of a buried plant fiber optic housing stake mounted in place. These units include all the labor and material to install housing base material, housing numbers, route letters, and directional and other markings of buried fiber optic cable, except as specifically provided for in other units. Includes all labor and material to install all splicing, or splice case, or fiber termination hardware and accessories as necessary, bonding connectors, harnesses, and grounding connector for terminating external ground wire, in accordance with RUS Splicing Standard Bulletin 1753F-401 (PC-2).The entire BD Section requires the mounting of the Fiber Optic warning labels provided by RiverStreet Networks on every pedestal upon installation.

BDO5EF (PRO12)

- This labor and materials unit will consist of a standard type PRO 12 with any and all miscellaneous hardware, washed pea gravel, and pedestal numbers that are being used to mount a separate fiber splice box closure for termination of fiber drops at new fiber distribution pedestal locations. The fiber splice box closures will be covered under the HBFO section of the contract. The contractor will provide Pro12 manufacturer by Emerson Network Power or equivalent. This unit will be staked mounted. Each pedestal location will be grounded to 8 feet ground rod that will be covered BM units. All work to mount the fiber splice box will be covered under the closure units. Lids will remain off pedestals until the fiber splicer can open fiber for proper placement in closures. The amount of loop fiber left in pedestals will be very critical.
    - Vendor=Graybar
    - Manufacturer =Emerson Network Power
    - Part #PRO12-FSNGE
    - Catalog #F1007798
- 42" Single Mount PED Stake (to be used with BDO5EF)
    - Graybar Part #88231475

BDO7

- This labor and materials unit will consist of an Emerson Network Power FTTP Pedestal OPFOBD7 Part No. F112503, or equivalent, that includes the stakes for mounting and it will be used to mount a separate fiber splice closure and any and all miscellaneous hardware, gravel and pedestal numbers. The fiber splice closures will be covered under the HBFO section of the contract. This pedestal will be used at all locations with a separate tap fiber also entering the pedestal. Each pedestal location will be grounded to 8 feet ground rod that will be covered BM units. The amount of loop fiber left in pedestals will be very critical.
    - Vendor=Graybar
    - Manufacturer =Emerson Network Power
    - Part # OPFOBD7

- Graybar Part # 92142933

Section BFO – BURIED FIBER OPTIC CABLE ASSEMBLY UNITS

Each unit consists of one (1) foot (0.305 m) of buried fiber optic cable in place. This unit includes all material and labor for installing, ripping (where necessary as determined by the Engineer), and backfilling, except as specifically provided for in other units. Where the cable is plowed, ripping may be necessary to provide a ripped path to allow placement at the required depth, and may require more than one ripped pass. The unit definition for all BFO units is modified to require that all buried cable placement be done in the "stop and go" method; i.e., plowing/trenching will proceed to a pedestal location; the equipment will be stopped until the pedestal is set, whereupon the equipment will proceed to the next pedestal location. **All gravel, seed and straw materials required to return the construction area of this contract to an acceptable level for the entire project is to be provided by the contractor and included within the labor unit prices of all BFO units.**

BFO XXX R

- This unit definition is changed to include for any unit shown with an "R" and will require a central core cable as the size indicated by the "XXX". All fiber sizes below 48 will be ordered in cut lengths that will be determined by the contractor. Note: All Tap fiber cables shown on the construction sheets will not be shown as "dual" when they parallel the mainline distribution cables in any direction and will be constructed with the mainline as one operation. Note: All ribbon cable ordered will be manufactured with Corning glass inside a shielded central tube configuration.
  - Vendor=Graybar
  - Manufacturer =Corning
  - Catalog # XXXEC5-14100-53 (24-216 Fibers)
  - Catalog # XXXEV5-14100-53 (288 and Up)

BFO 12 (SEBO 12-C)

- This unit definition is changed to include for the unit shown with "SEBO 12-C" and will require a shielded single tube cable containing 12 fibers. This cable is used in the BFO section as well as SEBO section. This same cable will be used in both sections; however the method and depth of installation will be different. Note: All Tap fiber cables shown on the construction sheets will not be shown as "dual" when they parallel the mainline distribution cables in any direction and will be constructed with the mainline as one operation. Note: All BFO 12 (SEBO 12-C) cable ordered will be manufactured with Corning glass inside a shielded loose tube configuration.
  - Vendor=Graybar
  - Manufacturer =Corning
  - Catalog # 012EB5-14100A20

Section BH – BURIED HANDHOLE ASSEMBLY UNITS

Consists of labor and material for one (1) buried handhole installed in place, including the base, top cover and mounting hardware, and pea gravel. The handhole size, amount of pea gravel and the installation must be as specified by the Engineer. The handhole assembly unit must be used only in areas of non-vehicular traffic. When required for use in areas of vehicular traffic, the handhole must be rated to withstand vehicular traffic.

BHF (30x52x43)RD

- This unit consists of all labor and materials to install a Hubbell Base Part PR3944 BA24 & LID PR3900 HA21 with penta head bolts, or equivalent, fiber optic, heavy duty bolt down lid handhole at the proper depth to maintain the lid at the contour of the ground in the area where it is installed. This unit will include providing and installing 6" of washed gravel placed on a commercial landscape cloth under the handhole in a circle 60" in diameter for proper drainage of the handhole. The lid will be labeled with a logo marked as "Fiber Optic".
    - Vendor=Graybar
    - Manufacturer =Quazite
    - Part # PR3944BA24 (Box)
    - Part # PR3900HA0021P (Cover)

Section BM – MISCELLANEOUS ASSEMBLY UNITS

Consists of all labor and material to construct and install the units defined individually below required for the installation and construction of the buried cable portions of the Project:

BM2 (5/8")(8')C

- This labor and materials unit differs from the standard, equivalent unit (Hubbell GC268) only in that it requires a copper-clad ground rod with matching clamps as well as the provision, and installation of an auxiliary grounding connector. In addition No. 6 AWG, copper ground wire is to be provided. This unit will be shown on all staking sheets and tabulations as a BM2.
    - Vendor=Graybar
    - Manufacturer =ERICO
    - Graybar Part # 94035117
    - UPC #: 78285630609

BM 60 DROP

- This per foot labor and materials boring unit is for any bore where only a drop will be installed and can be done with any standard boring method. A 3/4" plastic water line pipe can be used and will be placed at the same depth as the drop requirements and will be paid no more than one foot to each side of the hard surface to be bored. It

includes all the requirements of standard BM60 unit regarding any and all other requirements. All drops placed in bores with other fiber cables will not be paid as a separate unit and the required water lines should be placed for the drop installation and left sticking out of the ground a few inches for the future drop placement.

BM 60(X-Y)DP *(This Work Order only contains BM 60(1-2)DP)*

- This labor and materials unit is modified hereby to stipulate that the number specified by the "X" indicates the number of separate pipes, orange HDPE SDR 13.5 or thicker pipe be placed in each bore in the inside diameter as specified by the "Y" in the parentheses. All bores will be placed at a minimum of 30" deep and will be paid no more than three feet to each side of the hard surface to be bored. Any bores added for the contractor's convenience will be done at the contractor's own expense.
    - Example: 2" HDPE SDR 13.5
    - Vendor=Graybar
    - Manufacturer =Dura-Line Corporation
    - Catalog # 1004339
    - Graybar#25646142

BM71

- This labor and repair materials unit is modified hereby to stipulate that no BM71 will be paid except for sawing, blasting, or chipping in the absence of "spec." plow, i.e., a 20,000 pound cable plow, or a 55,000 pound cable plow train. All BM71 units must be approved by the Resident Engineer in advance of the work being done.

BM72

- This labor and repair materials asphalt assembly unit is modified to include one square foot of a minimum of 2" of asphalt and can be specified to any depth.

BM73

- This labor and repair materials concrete assembly unit is modified to include one square foot of a minimum of 4" of concrete and can be specified to any depth.

BM83

- This unit consists of all necessary labor and materials to place a 5/8" x 5' plastic house riser guard at the end of every fiber drop. Charles Industries Part No. 12-119S, or equivalent. The excess fiber drop is to be coiled up at the top of the riser and taped in a neat coil and tie wrapped to existing copper protector or drop to prevent the new fiber drop from being damage until it can be placed in service.
    - Vendor=Graybar
    - Manufacturer =Charles

- Part # 12-119s
- Graybar # 25422537

BMCULV (BMCULVERT)

- This labor only unit is required for placement of the cable underneath the culvert when the culvert is too shallow and when the plow line is beyond the end of the culvert. This unit requires the placement of the fiber optic cable at a minimum of 2 feet from the end of the culvert and includes any and all digging in either direction to accomplish the placement.

BMWM

- This unit consists of all labor and materials required to temporarily re-locate existing water meter, if necessary to obtain the required depth of the cable being placed that will cross the water line. The water meter shall be replaced to its original location and all connections made to meet the water department guidelines. This unit is payable only at the direction, and approval of engineering personnel.

BMWL

- This unit consists of all labor and materials required to locate, cut and repair one (1) buried water line up to one inch (inner diameter) in size, if necessary to obtain the required depth of the cable being placed that will cross the water line. This unit will be paid only when subject water line is located prior to cutting. This unit is payable only at the direction and approval of engineering personnel.

BMWL(B)

- This unit consists of all labor and materials required to locate, cut and repair one (I) buried water line up to one inch (inner diameter) in size, if necessary to obtain the required depth of the cable being placed that will cross the water line. This unit will be used when the brass connections required by the water department is required. Can be purchased from TEC Utility Supply 336-884-8080 W'x3", SS Repair Clamp PN ROSCC 1 05X030 & W' Brass Coupler PNFBI07CEL. This unit will be paid only when subject water line is located prior to cutting. This unit is payable only at the direction, and approval of engineering personnel.

BMSK

- This labor and materials unit consists of the placement of a dry bag of 80LBS SAKRETE over an install fiber optic cable at a culvert if unable to get fiber optic cable to the specified depth, but will only be used if you have 18 inches of cover or more. This is an option only to be used at the discretion of the Resident Engineer.

Section HBFO – BURIED SPLICE CLOSURE ASSEMBLY UNITS

This unit consists of a buried splice closure installed in place. It includes the labor and material for setting up in preparation for installing the closure, such as, excavating a splicing pit, installing closure in a housing or handhole if necessary, opening the sheath or jacket of the cable, bonding of the cable shields, and closing the closure in accordance with the manufacturer's instructions. Cable splicing must be compensated under the appropriate splicing units.

HBFO 144R-B6 (TYCO 450B)

- This unit consists of all labor and materials to install a Tyco FOSC 450 fiber optic ribbon splice closure, Part No. FOSC450-B6-6-NT-0-B3V, or equivalent, at each location indicated on the staking sheets on a distribution fiber cable up to 12 ribbons. Each closure will come with one tall storage basket and one splicing tray as specified. The majority of the closures specified will not require any additional trays but, at all locations requiring additional splicing trays, they will be provided as needed as part of this unit. This unit will include the coiling of fiber and proper mounting in the associated pedestal or handhole. This unit will include any miscellaneous materials to properly install all fiber cables and drops within the closure. All splicing units will be covered under the HO Section.
    - Vendor=Graybar
    - Manufacturer =Tyco Electronics
    - Part # FOSC450-B6-6-NT-0-B3V
    - Graybar # 22110911

HBFO 288R-D (TYCO 450D)

- This unit consists of all labor and materials to install a Tyco FOSC 450 fiber optic ribbon splice closure, Part No. FOSC450-D6-6-R2-1-D6V, or equivalent, at each location indicated on the staking sheets on a distribution fiber cable up to 24 ribbons. Each closure will come with one tall storage basket and one splicing tray as specified. The majority of the closures specified will not require any additional trays but, at all locations requiring additional splicing trays, they will be provided as needed as part of this unit. This unit will include the coiling of fiber and proper mounting in the associated pedestal or handhole. This unit will include any miscellaneous materials to properly install all fiber cables and drops within the closure. All splicing units will be covered under the HO Section.
    - Vendor=Graybar
    - Manufacturer =Tyco Electronics o Part # FOSC450-D6-6-R2-1-D6V o Graybar # 25567634

HBFO 864R-600

- This unit consists of all labor and materials to install a Tyco FOSC 600 fiber optic drop splice closure, Part No. FOSC600-C8B-NT-C4V, or equivalent, at each location

indicated on the staking sheets on a distribution fiber cable up to 72 ribbons. Each closure will come with one tall storage basket and one splicing tray as specified. The majority of the closures specified will not require any additional trays but, at all locations requiring additional splicing trays, they will be provided as needed as part of this unit. This unit will include the coiling of fiber and proper mounting in the associated pedestal or handhole. This unit will include any miscellaneous materials to properly install all fiber cables within the closure. All splicing units will be covered under the HO Section.

- Vendor=Graybar
- Manufacturer =Tyco Electronics
- Part # FOSC600-C8B-NT-C4V

HBFO FB12 (TYCO FIBERBOX)

- This unit consists of all labor and materials to install a Tyco Fiberbox, or equivalent, fiber optic ribbon splice closure at each location indicated on the staking sheets on a distribution fiber cable up to 12 ribbons. Each box will come with storage capacity and one standard splicing tray should be ordered for each location. The majority of the boxes specified will not require any additional trays but, at all locations requiring additional splicing trays, they will be provided as needed as part of this unit. This Unit will include the mounting of the box in a BDOS pedestal as specified on the staking sheets. This Unit will include any miscellaneous materials to properly install all fiber cables within the closure. All splicing units will be covered under the HO Section
    - Vendor=Graybar
    - Manufacturer =Tyco Electronics
    - Part # LZ2935-000FIBERBOX WILKES

Section HO – FIBER OPTIC SPLICING ASSEMBLY UNITS

Consists of all labor and material and testing necessary to complete a single fiber optic splice, complete a ribbon fiber optic splice using mass splicing, to connect fiber-terminated ports using patch cords, or to terminate one optical splitter pigtail in accordance with RUS Splicing Standard Bulletin 1753F-401(PC-2). The labor must include initial measurement, minimizing the attenuation, splicing and stowing the spliced fiber or patch cord/pigtail in a fiber organizer. The labor and material for the fiber organizer is part of the appropriate splice closure unit or fiber patch equipment.

HO 1

- This unit consists of all labor and materials to splice a single fiber. This unit may require the breakout of a ribbon fiber to allow for splicing to certain fibers within the ribbon at each location indicated on the fiber distribution schematics. This unit is used only to splice fiber cables together and not drops. Any additional trays required for any location will be covered under the HBFO section. This unit will include any miscellaneous materials to properly splice each fiber within the closure.

HO 12R

- This unit consists of all labor and materials to splice a 12 fiber ribbon. This unit will not require the breakout of a ribbon fiber to allow for splicing to certain fibers within the ribbon at each location indicated on the fiber distribution schematics. This unit is used only to splice a complete 12 ribbon fiber cable together and not single fiber at each splice location as shown on the fiber schematics. This unit will include the proper routing of each ribbon as recommended by the manufacturer. This unit will include any miscellaneous materials to properly splice all ribbons within the closure.

HO DROP

- This unit consists of all labor and materials to splice a single fiber from a distribution cable to a service drop. This unit may require the breakout of a ribbon fiber to allow for splicing to certain fibers within the ribbon at each location indicated on the fiber distribution schematics. All fiber shown on the cable schematics at the service pedestal location will be spliced to a service drop or laid up in the splice tray for future services. This unit will include any miscellaneous materials to properly splice any fiber service drop within the closure or box.

Section NID - NETWORK INTERFACE DEVICE ASSEMBLY UNITS

Consists of a network interface device (NID) installed in place, with necessary hardware and jumpers connected, and where required, furnishing and installing a ground and/or bond in accordance with the Construction Sheets.

NID-ONT

- This labor and materials unit will include the rearrangement of existing copper NID if required and the placement of a new ONT housing provided by RiverStreet Networks in its final position for service. This Unit will also include the .5 m fiber jumper and SC UPC Connector and the splice required to splice to the fiber drop. The BM83 as bid will be placed into housing and mounted to the wall in a proper manner and paid for under the BM83 unit. The testing of the drop once spliced to the fiber jumper will be paid for by the HO Drop unit paid for in the pedestal. All power level readings will be required to be within .2 db of the level based on the fiber length and the number of splices and connectors and recorded and provided in writing to RiverStreet Networks.

Section SE - SERVICE ENTRANCE ASSEMBLY UNITS

Consists of one (1) foot (0.305 m) of service entrance wire or cable in place from the network interface device (NID) to either filled terminal blocks in a ready-access closure or buried plant housing; or buried cable pair. This unit includes all clamps, rings, hooks and other hardware required for attachment to poles, buried plant housings and buildings. This unit does not include the labor and material for connecting the wire or cable to the NID unless specified by the Engineer and suffixed by the letter "P". This unit does not include cable splicing. For

compensation purposes, the length of service entrance wire or cable includes the sum of the distance between supporting structures and when required the vertical runs on buildings and poles. The service entrance units are further defined as follows:

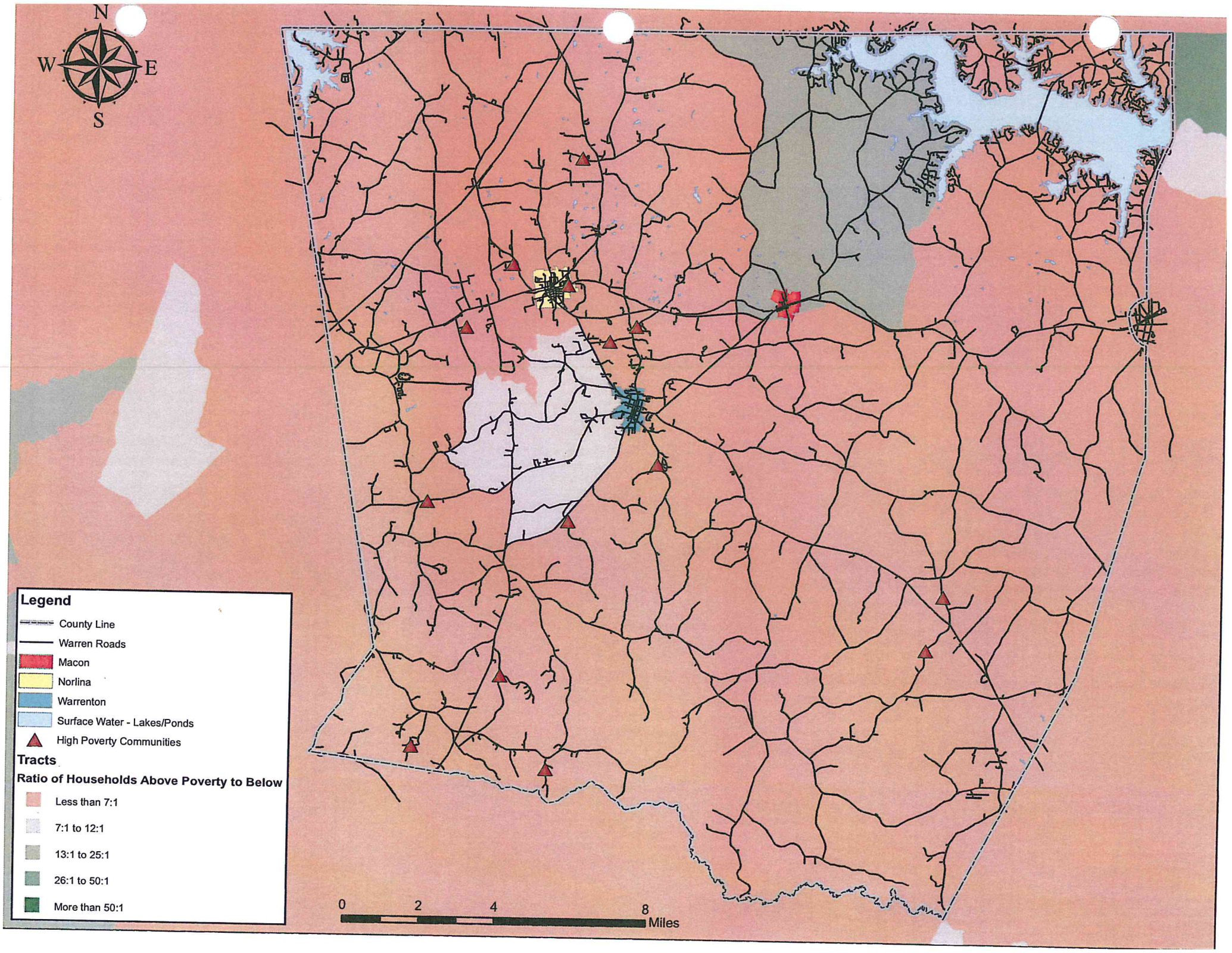
SEBO-4

- This unit consists of all labor and materials to install a four fiber round service drop with single sheath and metallic shield for location purposes with a loss of .4dB/km at 1310nm. No service drops will be placed without verbal permission from each property owner before installation starts. The new drop should be placed to the same locations as the copper drop unless it is not near the power service entrance. In these locations where the existing drops are not close to the power entrance, effort should be made to decide if moving the drop location can be completed. Each drop will be buried to 18" on DOT rights-of-ways and 12" on private property. If the drop is allowed to enter any cultivated area, it will maintain a minimum of 24" depth. The installation of drops into closures at pedestals will be covered by the HO-Drop unit and will include the grounding of the drop in a proper manner for location purposes. Each drop will be protected at the customer end by a house riser guard and the placement of the NID that will be paid for under the NID-ONT unit.
    - Vendor=Graybar
    - Manufacturer =Corning
    - Catalog # 004EB5-14100A20

SEBO-12D

- This unit consists of all labor and materials to install a twelve fiber round service drop with single sheath and metallic shield for location purposes at any location with more than four services with a loss of .4dB/km at 1310nm. No service drops will be placed without verbal permission from each property owner before installation starts. The new drop should be placed to the same locations as the copper drop unless it is not near the power service entrance. In these locations where the existing drops are not close to the power entrance, effort should be made to decide if moving the drop location can be completed. Each drop will be buried to 18" on DOT rights-of- ways and 12" on private property. If the drop is allowed to enter any cultivated area, it will maintain a minimum of 24" depth. The installation of drops into closures at pedestals will be covered by the HO-Drop unit and will include the grounding of the drop in a proper manner for location purposes. Each drop will be protected at the customer end by a house riser guard and the placement of the NID that will be paid for under the NID-ONTunit.
    - Vendor=Graybar
    - Manufacturer =Corning
    - Catalog # 012EB5-14100A

Section 12


N
W
E
S
Legend
County Line
Warren Roads
Macon
Norlina
Warrenton
Surface Water - Lakes/Ponds
High Poverty Communities
Tracts
Ratio of Households Above Poverty to Below
Less than 7:1
7:1 to 12:1
13:1 to 25:1
26:1 to 50:1
More than 50:1
0
2
4
8
Miles

Section 13

VantagePoint
EMPLOYEE OWNED

MAY 2018

Wilkes County Wireless Design Report Revision

NC – Wilkes Communications

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Senior Staff Engineer

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Table of Contents

1. Overview

Wilkes Communications, Inc. contacted Vantage Point Solutions (VPS) to assess existing vertical assets, as well as design and determine the predicted wireless coverage for Fixed Wireless Access (FWA) network to deliver broadband services within Warren County, North Carolina. This FWA network design is to be included as part of a comprehensive fiber to the premises (FTTP) feasibility study that Wilkes Communications, Inc. is conducting on behalf of Warren County. Wilkes Communications is proposing a fiber-based deployment within the Warren County communities and housing units along its proposed fiber optic ring, Wilkes Communications is seeking the proposed FWA network to deliver a baseline 10/1Mbps service to the rural housing units as an interim solution until Wilkes Communications can complete the underlay the FWA network with the proposed long-term FTTP network.

After reviewing the initial report provided in March, on May 2nd,2018, Wilkes Communications, Inc. contacted VPS regarding rerunning the analysis and revising the Cap-Ex and Op-Ex after removing the originally proposed sites covering along Kerr Lake and Lake Gaston along the northern edge of Warren County, along with minor adjustments to the originally proposed sites.

2. Spectrum Screen – Part 90 Operations

With the transition to Part 96 operations, the FCC's ruleset for the Citizens Broadband Radio Service (CBRS) band, 3550 MHz – 3700 MHz, requires protections for grandfathered existing Part 90 (3650 MHz – 3700 MHz)[1] incumbent operations during this transition. To ensure that a proposed network would provide the required grandfathered protections for any Part 90 incumbents, VPS investigated the existing Part 90 license holders that may have operations in or in the vicinity of Warren County.

The Part 90 spectrum screen conducted by VPS resulted in no currently active operators with Part 90 base stations registered within Warren County. Per the FCC's Part 90 ruleset, each base station[2] must be registered on the FCC's universal licensing system (ULS) prior to transmitting. With no existing Part 90 operations requiring protections, the CBRS band becomes a viable option in addition to the unlicensed spectra for delivery of the proposed 10/1Mbps FWA service to the rural areas of Warren County, as Wilkes Communications currently does not control any FCC-licensed spectra.

3. High-Level RF Design

The current industry projection is for the FCC to allow CBRS General Authorized Access (GAA) to become commercially available within the fourth quarter of 2018, with the FCC not hosting the initial Priority Access License Auction until the third quarter of 2019. With this, no current Part 96 licenses to secure, and no new Part 90 licenses being issued, if Wilkes desires to deploy the interim FWA solution within Warren County prior to the fourth quarter of 2018, VPS would recommend that Wilkes concentrate its efforts to the unlicensed spectra. If the FWA deployment can be furloughed until the fourth quarter of 2018 or the first quarter of 2019, VPS would recommend that Wilkes pursue a CBRS deployment.

A CBRS deployment, even a GAA deployment allows for greater EiRP levels than those specified by the FCC for the unlicensed bands. In addition to the higher EiRP levels, even with the GAA variant, CBRS

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1 The FCC allowed for operators to file for Part 90 grandfathered protections, as the new CBRS (Part 96) band overlaps the existing Part 90 band in its entirety.

2 A traditional sector consists of a base station in combination with an antenna system.

deployments will have interference protections based on the Spectrum Access System (SAS) coordination. Most manufacturers offer product lineups for the CBRS spectrum allow for channel concatenation and the utilization of higher order MIMO configurations.

If unlicensed spectra utilization is necessary, VPS recommends one of the typically least congested unlicensed bands, the National Information Infrastructure (U-NII) bands, which consists of the 5.15-5.35 GHz, 5.47-5.725 GHz and 5.725-5.85 GHz bands (unlicensed 5 GHz bands)[3]. Operations in the U-NII bands, must adhere to the FCC's limitations for equivalent isotopically radiated power (EiRP), which point-to-multipoint base stations must adjust their EiRP dependent upon the antenna system gains utilized. Having the FCC define the EiRP limits of operations for the U-NII band allows for comparable coverage between manufacturers, with the modulation schemes and receiver sensitivities, both of which directly impacts end-user throughputs and interference tolerances, being the key differentiators between the various manufacturers. For purposes of this report, VPS assumed U-NII equipment with dual-pole encapsulated 20.0 dBi base station antennas and adjusted the transmitter power levels to bring the EiRP to those limits specified by the FCC.

Due to FCC imposed limitations, a network operating within the Part 96 CBRS band will have a comparable, although typically larger footprint. The increased CBRS footprint is due to the utilization of the higher allowed transmitter power levels and the utilization of 4x4 MIMO, compared to a network designed for the unlicensed 5GHz bands utilizing 2x2 MIMO. Therefore, if Wilkes proceeds with an unlicensed 5 GHz band design, a Part 90/Part 96 network could readily be overlaid and/or entirely replace the proposed unlicensed 5 GHz U-NII bands sites, without significantly sacrificing the proposed design coverage.

A. Spectral Efficiency

A sector's total throughput capacity is expressed in terms of its Spectral Efficiency; that is, its throughput capability per unit of spectrum utilized. With the CBRS band utilizing Long Term Evolution (LTE) where its peak spectral efficiency might be for example 4bps per Hz of spectrum, the average Spectral Efficiency among all users near and far for LTE using 2x2 MIMO today, according to the LTE standards body itself, is only 1.69 bps/Hz, this admittedly is a figure for mobile users, though. By careful selection of permitted user locations and minimum acceptable signal qualities, some operators have been able to achieve Spectral Efficiency for FWA systems using 2x2 MIMO as high as 2.88 bps/Hz and sometimes even higher, if they have edge or stand-alone cells where noise from the still-usable but avoided, more marginal signal still being sent into neighboring cells is not a factor. For example, the CBRS LTE system is typically deployed using a single 10 MHz channel for each sector. An average spectral efficiency of 2.88 bps/Hz x 10 MHz channel = 28.8 Mbps average downlink throughput. Moving up to 4x4 MIMO will generally provide about a 160% increase in average spectral efficiency, or on the order of 46 Mbps average downlink throughput on a 10 MHz channel. (These throughputs must be reduced to account for the downlink/uplink ratio utilized by the Time Division Duplexing (TDD) systems, supporting both downlink and uplink on a single channel, such as in the 3.5 GHz CBRS band.)

In general, providing wireless services closer to the subscribers improves signal strength translating to speed and reliability, which is the concept of reducing the site coverage radius and maximizing spectral efficiency.

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[3] Even this modest amount of interference will cut its spectral efficiency in half and for this reason, VPS can no longer recommend consideration of the 2.4 GHz unlicensed bands. As 2.4 GHz now suffers significantly higher third-party interference, pretty much ubiquitously today. In VPS' experience with other working 2.4GHz Unlicensed systems, interference has now hamstrung these systems and their range and capacity where used for access, even in rural areas now where one might not have expected this to be an issue in the past.

Systems operating in the 5 GHz U-NII unlicensed spectra use Time Division Multiple Access (TDMA) multiplexing technology, which are based on the 802.11ac standard, with a typical average spectral efficiency of 1.875 bps/Hz.

B. Terrain

The topology of the proposed service area is comprised of ridgelines bisected by creek bottoms that predominately feed into Kerr Lake and Lake Gaston along the northern edge of Warren County. VPS utilized terrain files for its RF engineering tool that were downloaded from the United States Geological Survey (USGS) and account for variations in the terrain. The utilized terrain files are accurate to a resolution of one arc-second or approximately thirty (30) meters. The terrain file, along with the road vectors (dark gray lines) and Warren County border (thicker purple line) are shown in Figure 1.

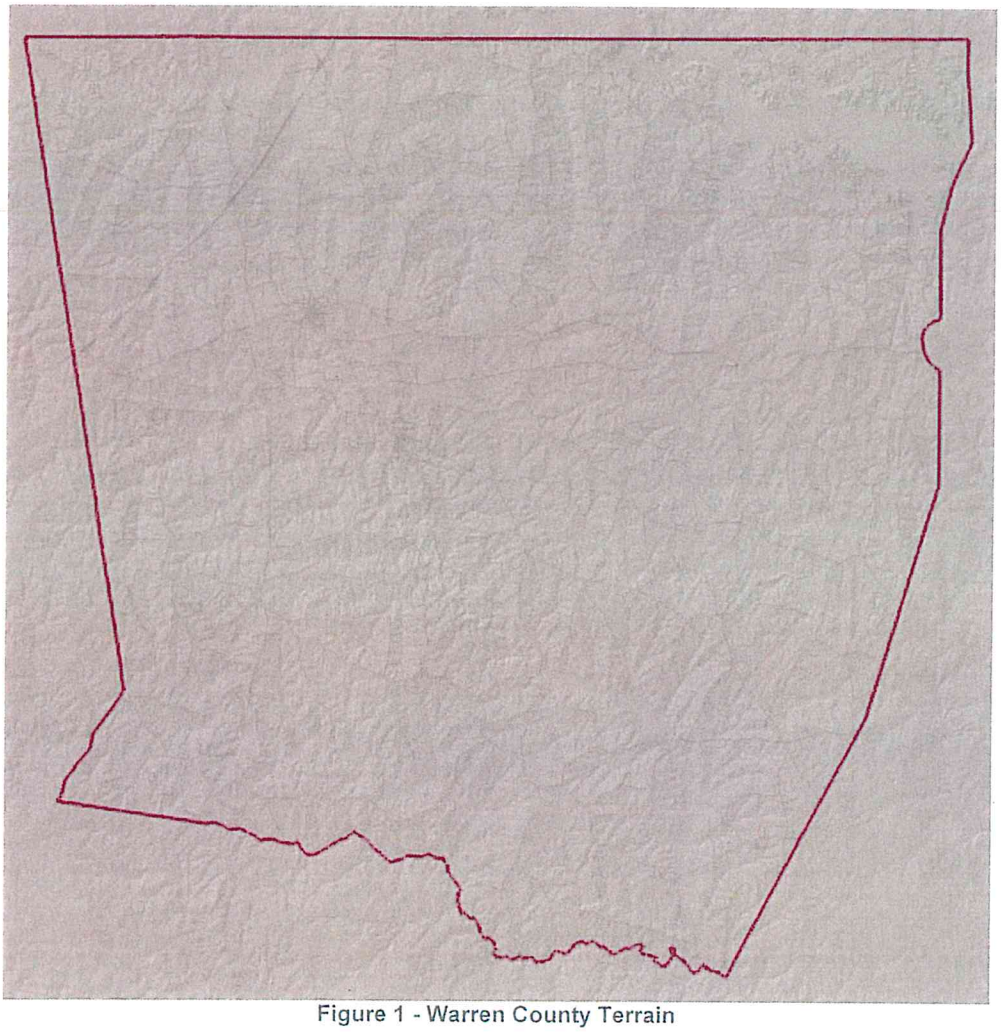


Figure 1 - Warren County Terrain

C. Clutter

The clutter files utilized for the RF engineering tool accounted for all twenty-two (22) morphology classes specified by the National Land Cover Database (NLCD) compiled by the USGS. The utilized clutter files are also accurate to a resolution of one arc-second or approximately thirty (30) meters. The clutter files, along with the road vectors (black lines) and Warren County border (thicker purple line) are shown in Figure 2.

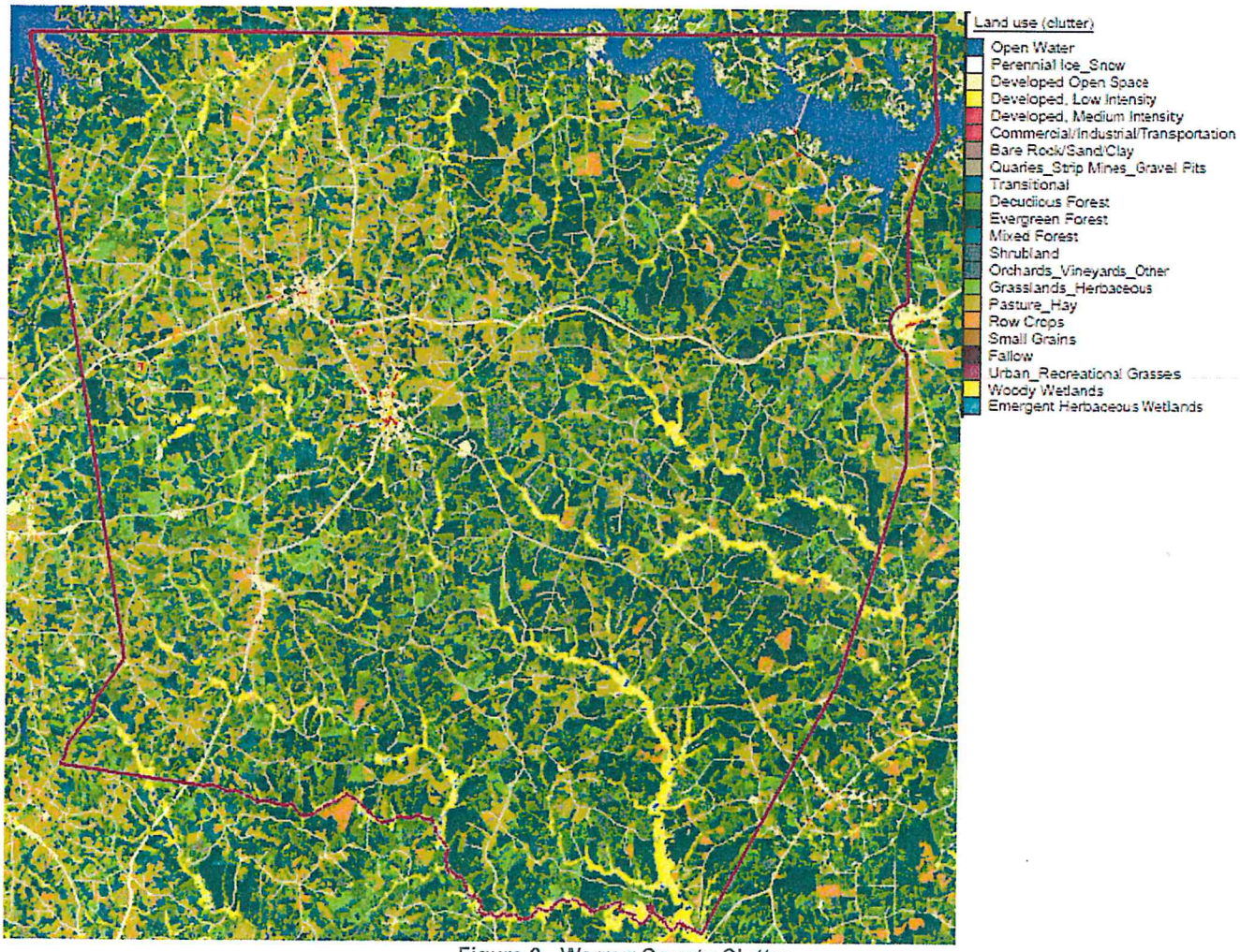


Figure 2 - Warren County Clutter

D. Warren County Structures GIS File

Warren County provide a GIS file containing 14,528 locations of housing structures within Warren County, these structures are shown in Figure 3, as the teal crosses. For purposes of this FWA network design, VPS utilized its GIS software tools to extract the structures within half of a mile of the Wilkes proposed fiber routing, as shown as the purple line in Figure 3, and within the corporate city limits of those communities along the proposed fiber route, assuming these housing units will have FTTP services built to them during the mainline construction activities, which resulted in 11,280 remaining structures that were utilized for the selected placements of the proposed FWA sites.

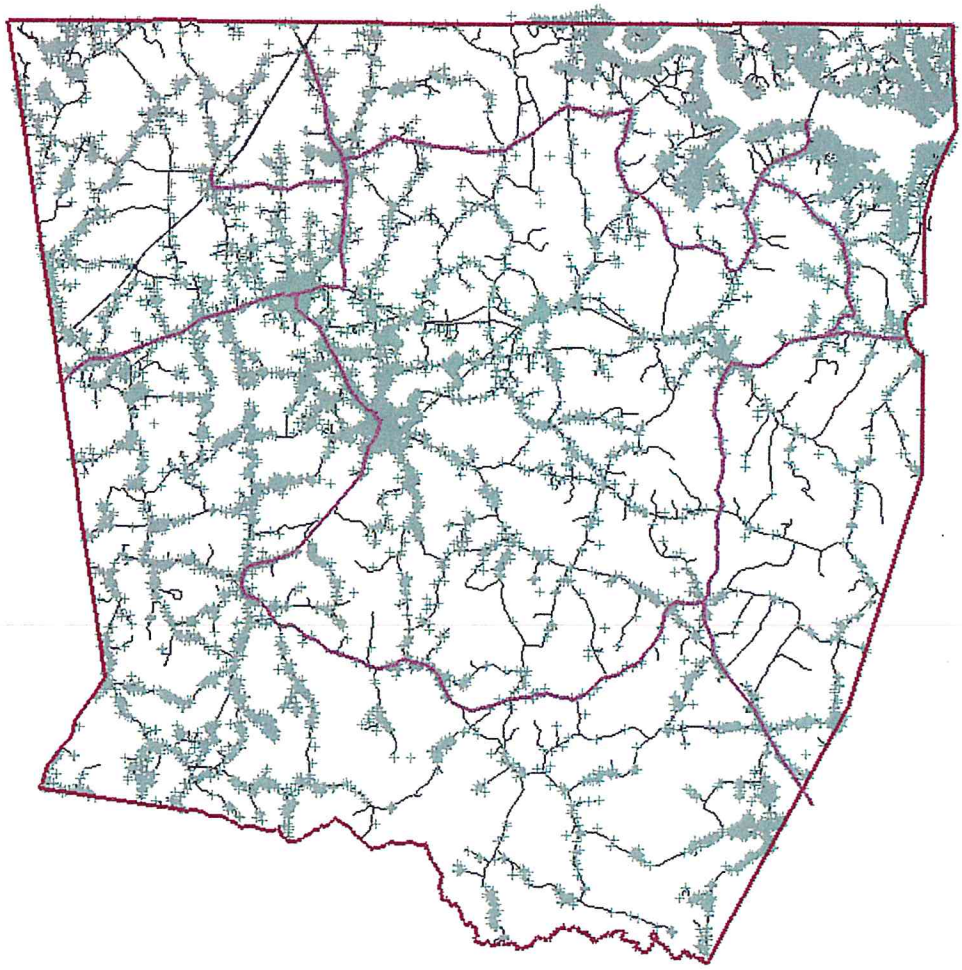


Figure 3 - Warren County Structures

E. FCC Registered Towers

After determining the frequency band for consideration, VPS next investigated the FCC registered towers throughout Warren County. Table 1 and Figure 4 detail the FCC registered towers within Warren County, including the FCC registration number, tower owner and overall height above ground level (AGL), including all appurtenances[4], for the tower site.

[4] When discussing tower heights, appurtenances are anything secured to the tower that exceed the actual tower height. Examples of tower appurtenances that typically exceed the actual tower height are antennas, lightning rods, tower lighting strobes, etc.

ASR Number	Tower Owner	Height	Latitude	Longitude
1275914	US Cellular	310'	36.49480556°	-77.90402778°
1290044	American Towers	310'	36.44730556°	-77.90086111°
1268034	US Cellular	310'	36.40311111°	-77.92911111°
1251996	Vertical Bridge Towers	325'	36.27863889°	-77.90333333°
1265578	Cellco Partnership	256'	36.25313889°	-77.93894444°
1262337	US Cellular	310'	36.21730556°	-77.9805°
1264306	NC State Highway Patrol	400'	36.21138889°	-78.06922222°
1251995	US Cellular	325'	36.22777778°	-78.10611111°
1238889	Radio Training Network	488'	36.29569445°	-78.10555556°
1290862	American Towers	308'	36.29825°	-78.22230556°
1289318	American Towers	260'	36.29825°	-78.22230556°
1004804	American Towers	406'	36.43825°	-77.95011111°
1292158	American Towers	308'	36.50033333°	-78.02622222°
1295675	Alltel Communications	269'	36.51211111°	-78.04430556°
1289310	American Towers	310'	36.42488889°	-77.98°
1283852	US Cellular	310'	36.32158333°	-78.21797222°
1008958	American Towers	271'	36.34638889°	-78.23194444°
1291502	Crown Castle	260'	36.36213889°	-78.19980556°
1004598	US Cellular	355'	36.39722222°	-78.08416667°
1251256	SBA Towers	256'	36.42811111°	-78.10502778°
1281099	NC State Highway Patrol	495'	36.43694445°	-78.12455556°
1256972	US Cellular	250'	36.42322222°	-78.17155556°
1259726	NC State Highway Patrol	495'	36.41877778°	-78.27294444°
1239306	SBA Structures	199'	36.42777778°	-78.29375°
1233428	KJCO	248'	36.45033333°	-78.26655556°
1208097	SBA Towers	310'	36.44936111°	-78.24241667°
1004803	American Towers	315'	36.46680556°	-78.19877778°
1224606	Liberty University	367'	36.49416667°	-78.18944444°
1230762	US Cellular	330'	36.48294445°	-78.23377778°
1229169	Subcarrier Communications	260'	36.50908333°	-78.21097222°
1221840	American Towers	309'	36.52908333°	-78.21022222°

Table 1 - FCC Registered Towers

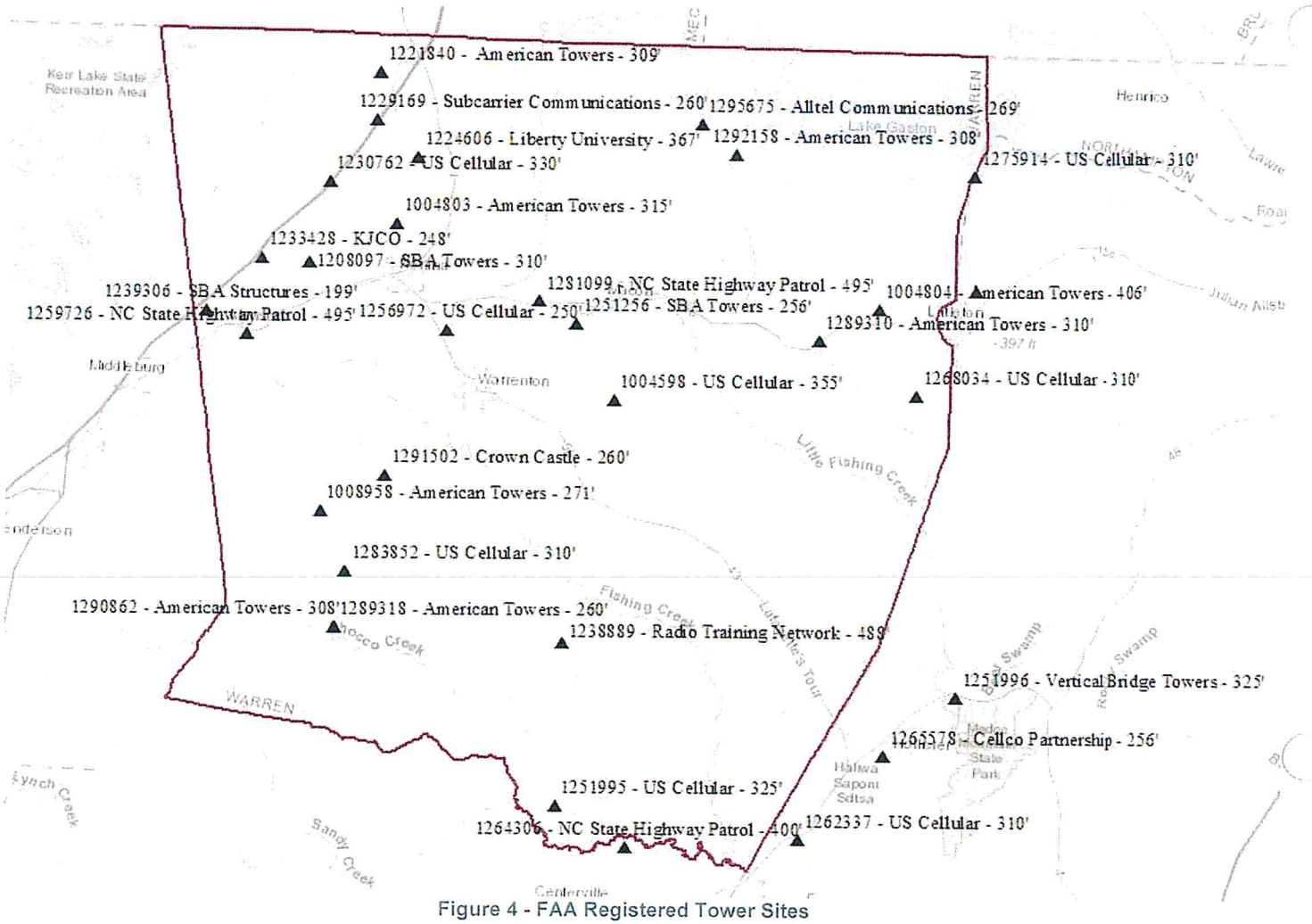


Figure 4 - FAA Registered Tower Sites

F. Additional Potential Collocation Structures

VPS also reviewed the footprint of Warren County for other potentially available supporting structures, such as water towers/tanks, buildings, etc., which are typically not be discoverable through the available FAA, FCC and other databases.

Table 2 and Figure 5 show the other potentially available supporting structures found by VPS within Warren County. While conducting the in-market ride along, it was determined that the only structures within Warren Count with the potential to support a wireless deployment were water tanks/towers. Also, during the in-market ride along, VPS utilized a rangefinder to determine the heights to the mid-tank platforms and top of the water tanks/towers.

Generic Name	Height to Railing	Height to Top	LATITUDE	LONGITUDE
Water Tank-1	140'	161.5'	36.38818632°	-78.15808025°
Water Tower -2	155'	190'	36.40852356°	-78.15443312°
Water Tower - 3	161'	186'	36.48372887°	-78.23003388°
Water Tower - 4	103'	123'	36.44445471°	-78.20963339°
Water Tower - 5	N/A	128'	36.42034855°	-78.27224741°
Water Tower - 6	143'	162.5'	36.43288329°	-78.00705774°
Water Tank - 7	126'	135'	36.40423333°	-78.1634°

Table 2 - Other Potential Structures

In Figure 5, the markers denote the water tanks/towers found within Warren County.

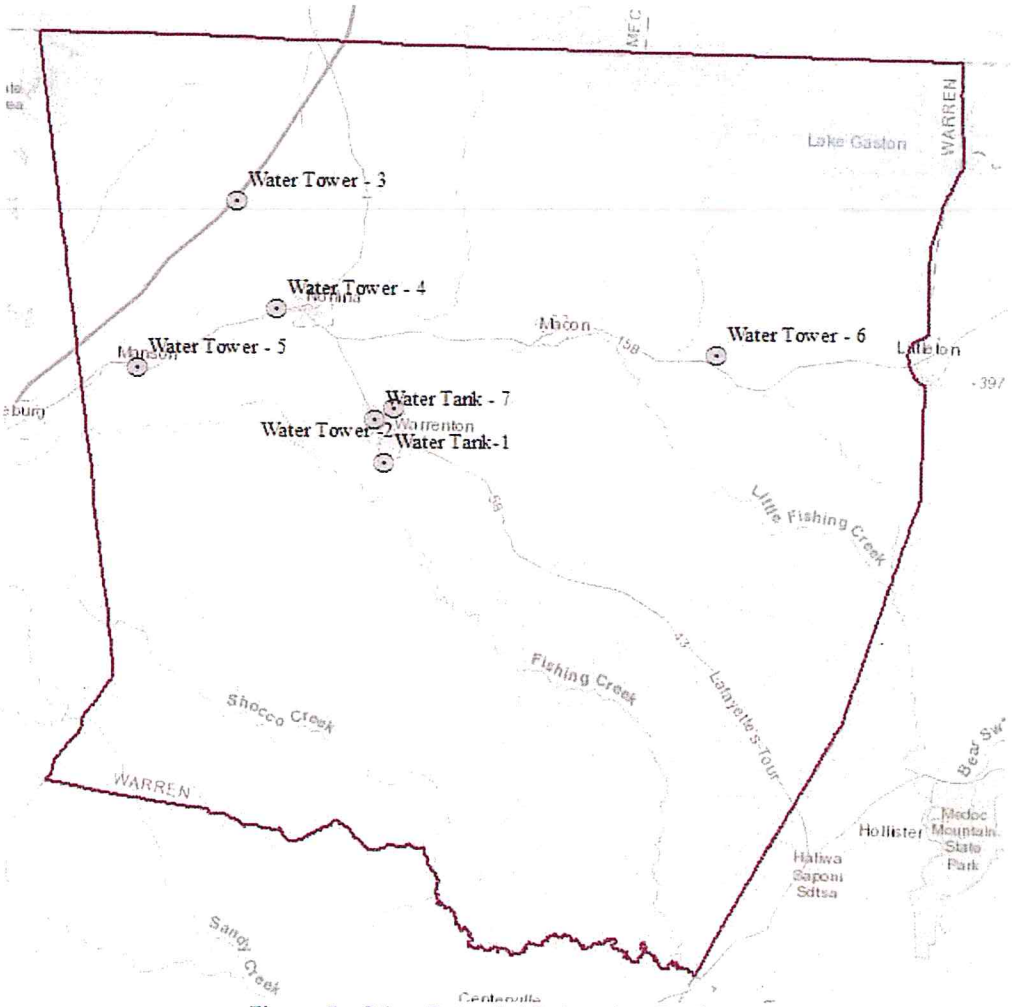


Figure 5 - Other Potential Colocation Facilities

G. Revised Site Listing

Wilkes requested a rerunning of the analysis and revising the Cap-Ex and Op-Ex, based on its preference to remove the initially proposed pole locations covering along Kerr Lake and Lake Gaston along the northern edge of Warren County, along with adjusting the proposed locations to site shown in Table 3 and Table 4

ASR Number	Tower Owner	Height	Latitude	Longitude
1275914	US CELLULAR	310'	36.49480556°	-77.90402778°
1268034	US CELLULAR	310'	36.403117°	-77.929136°
1265578	CELLCO PARTNERSHIP	256'	36.25313889°	-77.93894444°
1238889	RADIO TRAINING NETWORK	488'	36.29569445°	-78.10555556°
1289318	AMERICAN TOWERS	260'	36.29825°	-78.22230556°
1004804	AMERICAN TOWERS	406'	36.43825°	-77.95011111°
1292158	AMERICAN TOWERS	308'	36.50033333°	-78.02622222°
1008958	AMERICAN TOWERS	271'	36.34638889°	-78.23194444°
1291502	CROWN CASTLE	260'	36.36213889°	-78.19980556°
1004598	US CELLULAR	355'	36.39722222°	-78.08416667°
1281099	NC STATE HIGHWAY PATROL	495'	36.43694445°	-78.12455556°
1208097	SBA TOWERS	310'	36.44936111°	-78.24241667°
1004803	AMERICAN TOWERS	315'	36.46680556°	-78.19877778°
1224606	LIBERTY UNIVERSITY	367'	36.4941667°	-78.18944444°
1221840	AMERICAN TOWERS	309'	36.52908333°	-78.21022222°

Table 3 - Revised FCC Registered Towers

Other	Height to Railing	Height to Top	Latitude	Longitude
Water Tower - 2	161'	186'	36.48372887°	-78.23003388°
Water tower - 6	143'	162.5'	36.43288329°	-78.00705774°
Pole Option 12	New Construction	65'	36.341127°	-78.007351°

Table 4 - Revised Other Structure Listing

4. Proposed Coverage

Within its RF propagation tool, EDX SignalPro, utilized by VPS in preparing this RF Engineering Report, VPS utilized the Longley-Rice propagation model and utilized the Terrain and Clutter files detailed in Sections 3B and 3C.

To minimize the colocation fees accounted for in the proceeding Op-Ex estimations, if colocations were considered, VPS concentrated its efforts on those other potential colocation facilities, as these owners historically charge a lower monthly lease rate than the traditional tower owners.

Also, in efforts to further reduce the necessary expenses associated with the construction of new tower sites, VPS elected to utilize direct imbed ductile iron poles with an overall length of 75', resulting in an above ground level overall height of 65'. While towers/poles not exceeding 200' typically don't require FCC registration or

lighting per the FAA, full due diligence must be accomplished for each of the potential pole sites prior to erecting the proposed pole.

A.Initial Coverage

Base stations were typically configured in four-sector arrangements for capacity of subscribers that a given site can support, as well as to maximize channel reuse within the CBRS and U-NII bands. For the Customer Premises Equipment (CPE) units, the VPS RF predictions assumed utilizing "fixed" units, which incorporate dual encapsulated, 9.0 dBi antennas for the CBRS band and high-gain, 22.0 dBi antennas[5] for the 5 GHz U-NII bands. An assumed typical installation height of fifteen feet (15') was assumed for all CPE devices in the RF predictions shown in Figure 6 and Figure 7, for the CBRS band and 5 GHz U-NII bands. Larger views of both predictions are shown in Appendix 1 of this report.

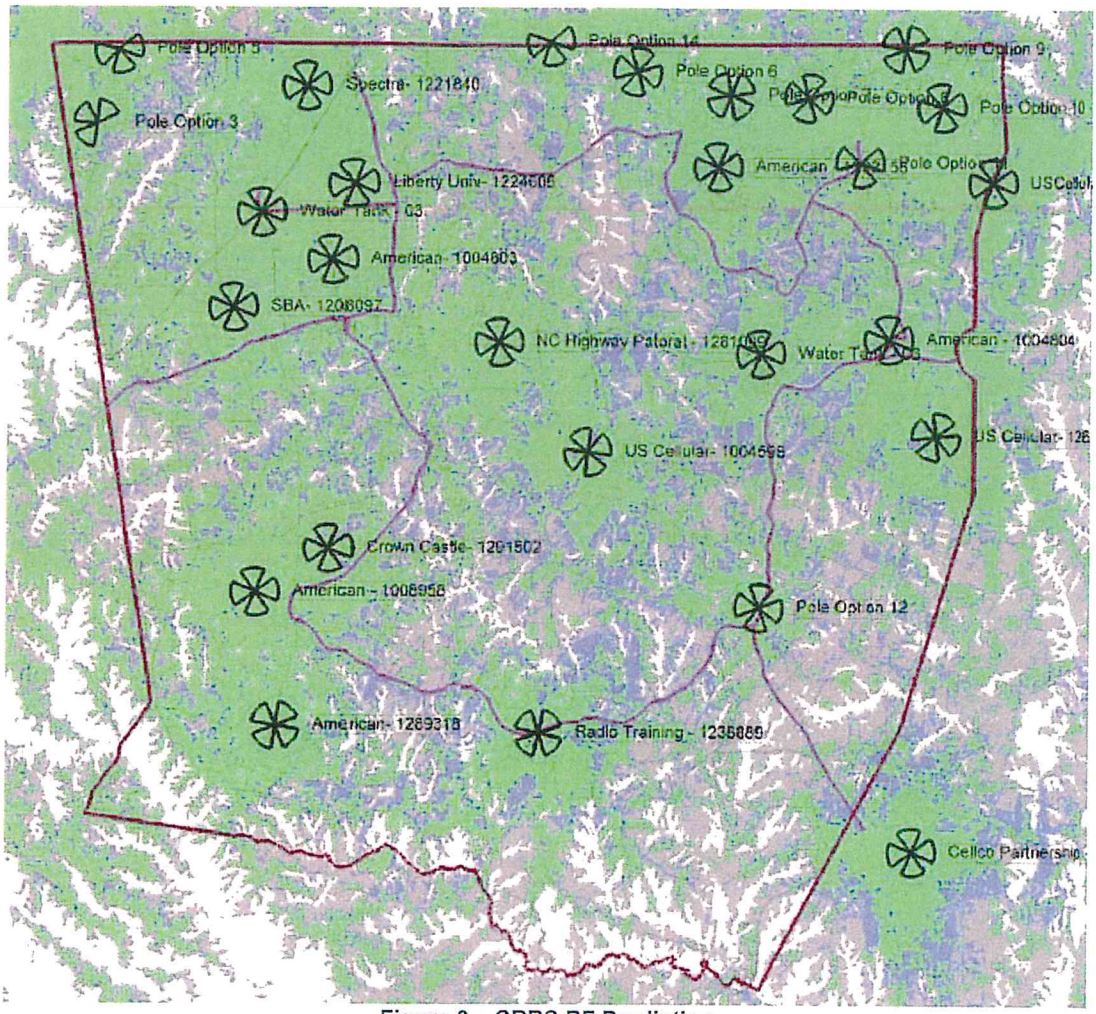


Figure 6 – CBRS RF Prediction

[5] CPE have EiRP limitations similar to the base station equipment, but CPE devices have lower transmitter power levels, which allow for the utilization of the higher gain antennas.

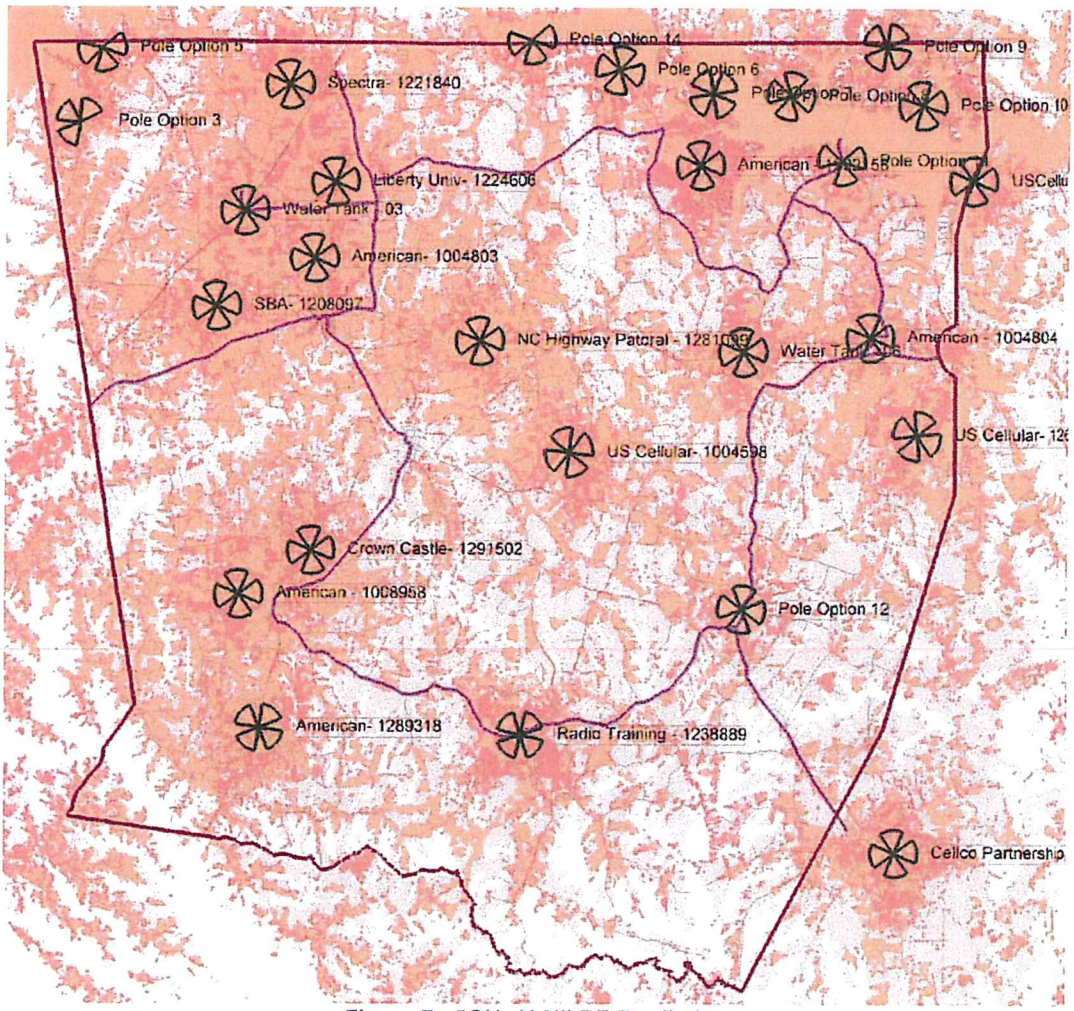


Figure 7 - 5GHz U-NII RF Prediction

B.Revised Coverage

For the revised coverage, VPS again assumed typical installation heights of fifteen feet (15') for all CPE devices in the RF predictions shown in Figure 6 and Figure 7, for the CBRS band and 5 GHz U-NII bands. Larger views of both predictions are shown in Appendix 2 of this report.

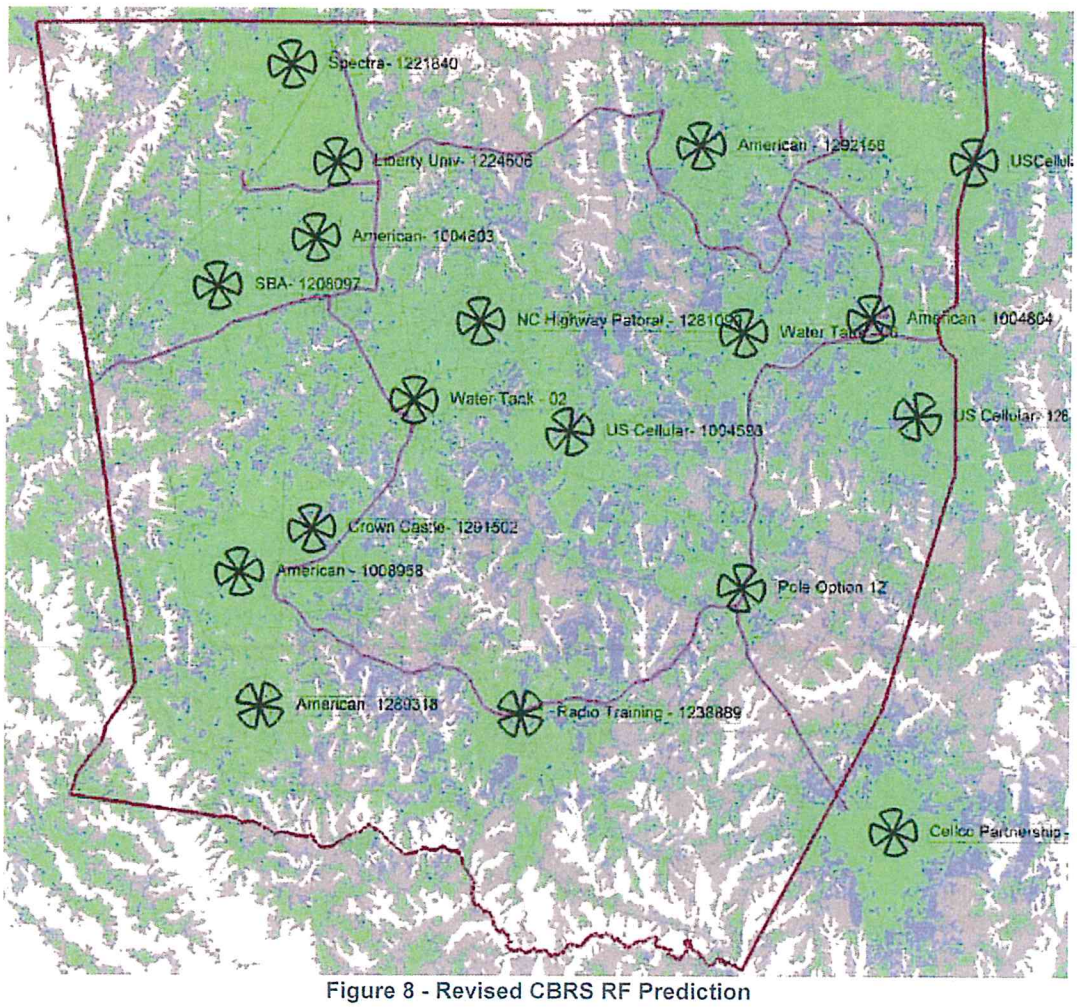


Figure 8 - Revised CBRS RF Prediction

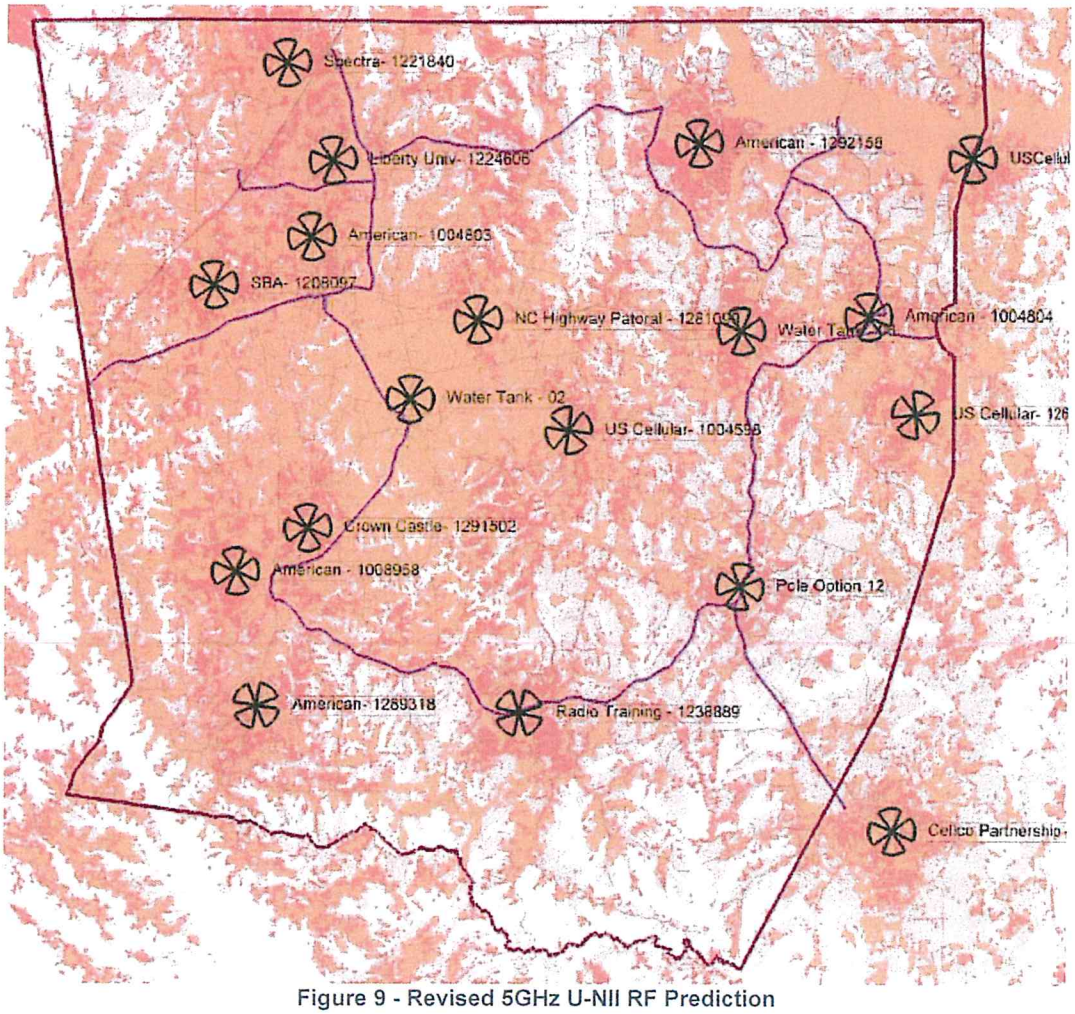


Figure 9 - Revised 5GHz U-NII RF Prediction

5. Initial Estimations

Based on the output of the RF modeling in Step 4, the resulting quantity and positioning of base station sites required for coverage, were utilized as the basis for deriving the following Cap-Ex and Op-Ex estimations.

The following estimations assume that Wilkes would operate the FWA network within Warren County utilizing a flat-rate billing, which is typical for wireless Internet service providers, rather than a metered or usage-based billing. This billing methodology would allow Wilkes to still be able to offer varying tiers of subscriber service levels with Warren County and bill accordingly. These prescribed tiers would be able to utilize any of site capacity available but would be limited to the throughput speeds based on the package tier purchased.

In addition, to combat network constrains that could be encountered through this flat-rate billing method due to the high volume of video content, VPS assumed Wilkes would utilize its existing deep packet inspection (DPI) platform to monitor the FWA network and take any necessary actions, as detailed within the Wilkes Telecommunications Broadband Internet Service Network Management Policy.

For inclusion in the Cap-Ex, VPS assumed that existing tower sites within a mile and half from the proposed fiber ring would have fiber extended to them, for tower and pole sites further than a mile and half from the

proposed fiber ring, microwave backhaul was assumed. Figure 10 shows the proposed fiber routing as the purple line and the proposed microwave links as the yellow lines.

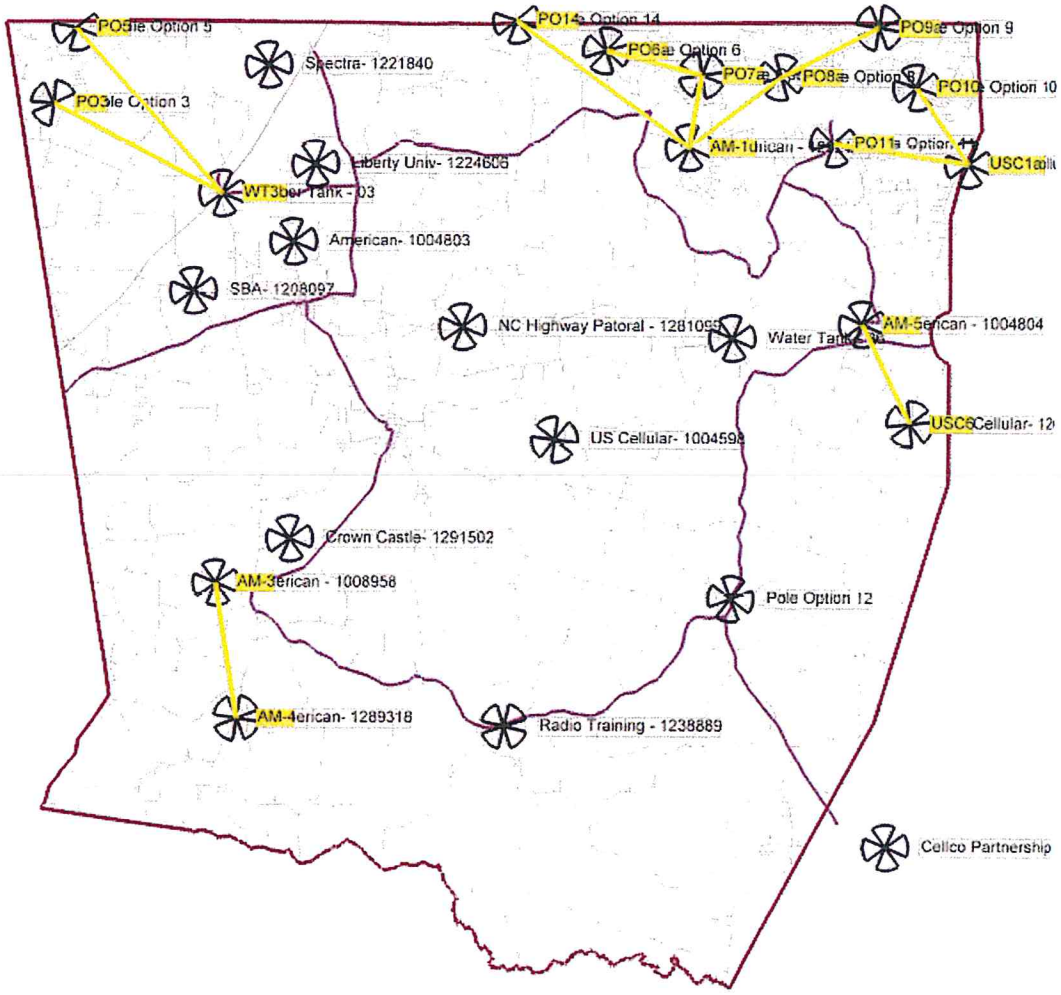


Figure 10 - Proposed Fiber Routing

A. Initial Cap-Ex Estimation

The following Network Equipment Cap-Ex assumptions are based off the RF prediction above and assumes that there will be seventeen colocation sites and ten new pole sites. A detailed breakout of the Cap-Ex estimations is shown in the Appendix 1 in Sections C and D.

The Network Equipment Cap-Ex detailed in Table 5 encompasses the site preparation efforts for the colocation sites, the base station with associated antenna systems, the backhaul electronics, the core network electronics and network spare equipment. For the 3.5 GHz CBRS band equipment Cap-Ex, the average equipment costs between Telrad and BaiCells were utilized, and for the 5 GHz U-NII band equipment Cap-Ex, the average equipment costs between RADWIN and Proxim were utilized.

VantagePoint
An Employee Owned Company

CBRS (3.5GHz) and U-NII (5GHz) Broadband Wireless Access (BWA)
Projected Capital Expenses

	Co-Lo	New	Co-Lo	New
	CBRS (3.5GHz) Proposed Co-Lo Sites Colocation (Assume 205')	CBRS (3.5GHz) Proposed New Pole Sites New Poles (Assume 65')	U-NII (5GHz) Proposed Co-Lo Sites Colocation (Assume 205')	U-NII (5GHz) Proposed New Pole Sites New Poles (Assume 65')
Network Equipment				
Tower / Site	$ 496,400.00	$ 879,300.00	$ 496,400.00	$ 879,300.00
Antennas and Lines Installation	$ 316,200.00	$ 144,903.00	$ 197,200.00	$ 101,700.00
Base Station Equipment	$ 491,300.00	$ 240,000.00	$ 418,200.00	$ 204,600.00
Backhaul	$ 625,100.00	$ 249,600.00	$ 625,100.00	$ 249,600.00
Core Network	$ 975,800.00	$ 516,600.00	$ 156,400.00	$ 82,800.00
Network Equipment Spares	$ 30,000.00	$ -	$ 22,400.00	$ -
Engineering & Gen. Project Mgmt. Services	$ 441,300.00	$ 304,800.00	$ 288,000.00	$ 228,100.00
Subtotals	**$ 3,376,100.00**	**$ 2,335,203.00**	**$ 2,203,700.00**	**$ 1,746,100.00**
Network Equipment Grand Totals	**$**	**5,711,303.00**	**$**	**3,949,800.00**

Table 5 – Network Equipment Cap-Ex Estimation

If Wilkes elects to proceed with a deployment utilizing the unlicensed 5 GHz U-NII spectrum bands, VPS highly recommends that prior to an actual deployment that field measurements be conducted to determine the real-world RF impairment environment, which will also allow for selection of the least impaired channels to be utilized for the deployment. The costs associated with these in field measurements have been accounted for under the Tower/Site line items for both the colocations and the new sites being proposed, under the 5 GHz U-NII pricing tables.

In addition to the Supporting Infrastructure and Network Equipment, VPS next considered the network CPE devices, as shown in Table 6. Based on the 2016 Census data, there are 11,813 housing units within Warren County and VPS has assumed a minimum of 27.5% penetration rate, comparable for the industry average in a competitive market, such as Warren County.

VantagePoint
An Employee Owned Company

CBRS (3.5GHz) and U-NII (5GHz) Broadband Wireless Access (BWA)
Projected Capital Expenses

Housing Units (July 2016 Estimates, US Census Bureau)

Housing Units within Warren County	11,813		27.5%	3,249

	CBRS (3.5GHz)		U-NII (5GHz)	
CPE Equipment	Per Unit Costs		Per Unit Costs	
CPE Devices	$ 500.00		$ 655.00	
Subtotals	120 Subscribers Per Site:	$ 1,624,500.00	120 Subscribers Per Site:	$ 2,128,095.00
Grand Total		$ 1,624,500.00		$ 2,128,095.00

Table 6 - CPE Cap-Ex Estimation

Factoring the Network Equipment and CPE Cap-Ex estimations, resulting in a Cap-Ex Grand Total of **$7,335,803.00** to deploy a typical 3.5 GHz CBRS network and **$6,077,895.00** to deploy a typical 5 GHz U-NII unlicensed network utilizing seventeen colocation sites and ten new pole sites.

B. Initial Op-Ex Estimation

For a 3.5 GHz CBRS network, VPS has included in the following Op-Ex summary in Table 7, showing the Support and Maintenance fees, along with the proposed site rental fees. VPS also included the SAS Support fees, which is currently a projection, as none of the seven tentatively approved SAS providers have detailed the exact costs they will charging for their support fees.

VantagePoint
An Employee Owned Company

Warren County
CBRS (3.5GHz) Fixed Wireless Access (FWA)
Projected Operating Expenses

	Sites	Per Unit Costs	Annual Operating Expenses
Software Update, Warranty & Support (Annual)			
4-Sector AP Technical Support	27	$ 7,600.00	$ 205,200.00
Software Maintenance	27	$ 6,700.00	$ 180,900.00
SAS Support Fee (Projected, Annual)	27	$ 720.00	$ 19,440.00
DPI Platform Warranty & Support	–	$ -	$ -
Other Op-Ex			
Tower Site Rental ($1,250/Month/Site)	15	$ 1,250.00	$ 225,000.00
Water Tank/Tower Rental ($950/Month/Site)	2	$ 950.00	$ 22,800.00
Total Other Op-Ex (Annual)			$ 653,340.00

Table 7 – CBRS Op-Ex

Most manufacturers with equipment for use in the 5 GHz U-NII bands do not offer annual support and maintenance contracts, but VPS has included the proposed site rental fees in the following Op-Ex summary in Table 8.

VantagePoint
An Employee Owned Company

Warren County
U-NII (5GHz) Fixed Wireless Access (FWA)
Projected Operating Expenses

		Sites	Per Unit Costs	Annual Operating Expenses
Software Update, Warranty & Support (Annual)				
	4-Sector AP Technical Support	--	$ -	$ -
	DPI Platform Warranty & Support	--	$ -	$ -
	Tower Site Rental ($1,250/Month/Site)	15	$ 1,250.00	$ 225,000.00
Other Op-Ex	Water Tank/Tower Rental ($950/Month/Site)	2	$ 950.00	$ 22,800.00
Total Other Op-Ex (Annual)				**$ 247,800.00**

Table 8 - Annual Op-Ex Summary

6. Revised Estimations

Based on the output of the RF modeling in Step 4 utilizing the sites identified in Table 3 and Table 4, VPS derived the following revisions to the Cap-Ex and Op-Ex estimations.

The following estimations again assume that Wilkes would operate the FWA network within Warren County utilizing a flat-rate billing, which is typical for wireless Internet service providers, rather than a metered or usage-based billing. This billing methodology would allow Wilkes to still be able to offer varying tiers of subscriber service levels with Warren County and bill accordingly. These prescribed tiers would be able to utilize any of site capacity available but would be limited to the throughput speeds based on the package tier purchased.

In addition, to combat network constrains that could be encountered through this flat-rate billing method due to the high volume of video content, VPS assumed Wilkes would utilize its existing deep packet inspection (DPI) platform to monitor the FWA network and take any necessary actions, as detailed within the Wilkes Telecommunications Broadband Internet Service Network Management Policy.

For inclusion in the Cap-Ex, VPS assumed that existing tower sites within a mile and half from the proposed fiber ring would have fiber extended to them, for tower and pole sites further than a mile and half from the proposed fiber ring, microwave backhaul was assumed. Figure 10 shows the proposed fiber routing as the purple line and the revisions to the proposed microwave links as the green lines.

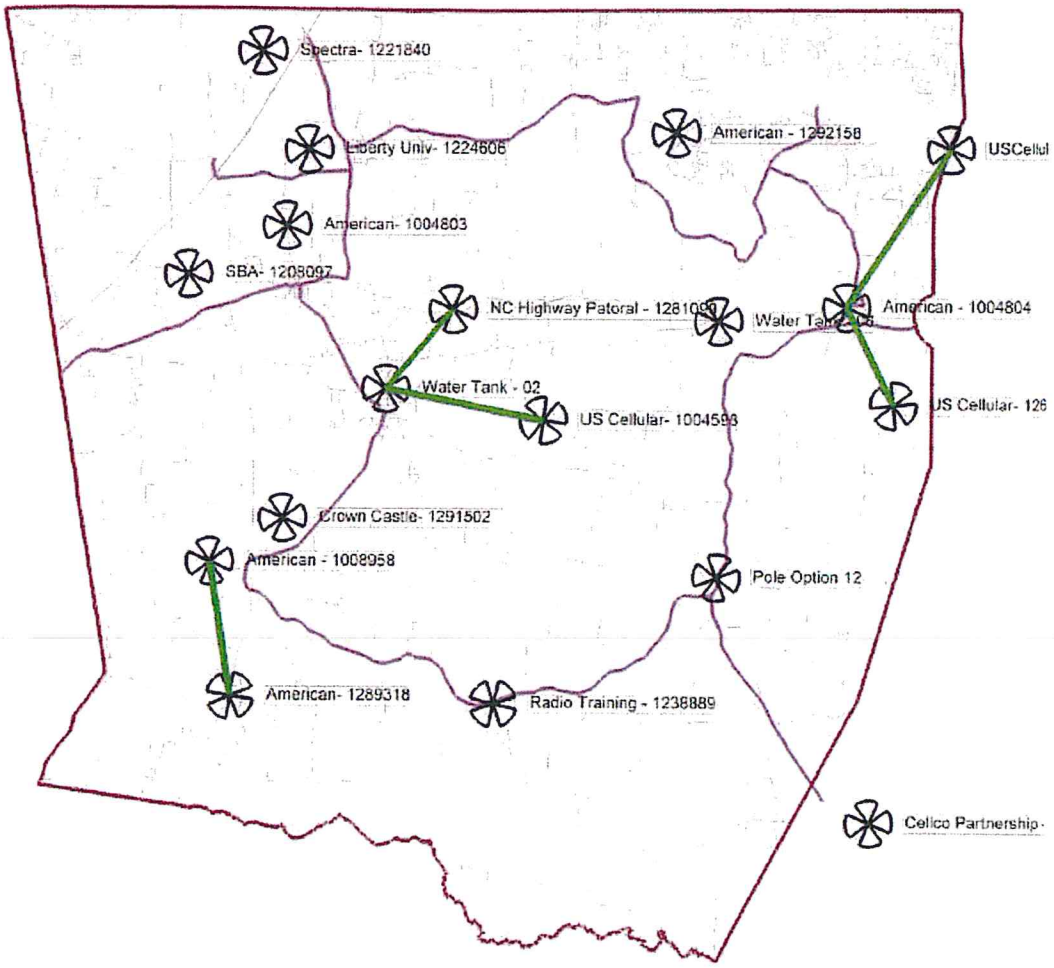


Figure 11 – Revised Fiber Routing

A. Revised Cap-Ex Estimation

The following revision to the Network Equipment Cap-Ex assumptions are based off the RF prediction above and assumes that there will be seventeen colocation sites and one new pole site. A detailed breakout of the Cap-Ex estimations is shown in the Appendix 2 in Sections C and D.

The Revised Network Equipment Cap-Ex detailed in Table 9 encompasses the site preparation efforts for the colocation sites, the base station with associated antenna systems, the backhaul electronics, the core network electronics and network spare equipment. For the 3.5 GHz CBRS band equipment Cap-Ex, the average equipment costs between Telrad and BaiCells were utilized, and for the 5 GHz U-NII band equipment Cap-Ex, the average equipment costs between RADWIN and Proxim were utilized.

VantagePoint
An Employee Owned Company

CBRS (3.5GHz) and U-NII (5GHz) Broadband Wireless Access (BWA)
REVISED - Projected Capital Expenses

	Co-Lo CBRS (3.5GHz) Proposed Co-Lo Sites Colocation (Assume 205')	New CBRS (3.5GHz) Proposed New Pole Sites New Poles (Assume 65')	Co-Lo U-NII (5GHz) Proposed Co-Lo Sites Colocation (Assume 205')	New U-NII (5GHz) Proposed New Pole Sites New Poles (Assume 65')
Network Equipment				
Tower / Site	$ 496,400.00	$ 97,700.00	$ 496,400.00	$ 97,700.00
Antennas and Lines Installation	$ 315,900.00	$ 15,100.00	$ 197,000.00	$ 11,300.00
Base Station Equipment	$ 491,300.00	$ 22,200.00	$ 418,200.00	$ 19,000.00
Backhaul	$ 722,150.00	$ 32,300.00	$ 722,150.00	$ 32,300.00
Core Network	$ 975,800.00	$ 57,400.00	$ 156,400.00	$ 9,200.00
Network Equipment Spares	$ 30,000.00	$ -	$ 22,400.00	$ -
Engineering & Gen. Project Mgmt. Services	$ 455,600.00	$ 33,800.00	$ 302,500.00	$ 25,500.00
Subtotals	**$ 3,487,150.00**	**$ 258,500.00**	**$ 2,315,050.00**	**$ 195,000.00**
Network Equipment Grand Totals	**$ 3,745,650.00**		**$ 2,510,050.00**	

Table 9 – Revised Network Equipment Cap-Ex Estimation

If Wilkes elects to proceed with a deployment utilizing the unlicensed 5 GHz U-NII spectrum bands, VPS highly recommends that prior to an actual deployment that field measurements be conducted to determine the real-world RF impairment environment, which will also allow for selection of the least impaired channels to be utilized for the deployment. The costs associated with these in field measurements have been accounted for under the Tower/Site line items for both the colocations and the new sites being proposed, under the 5 GHz U-NII pricing tables.

In addition to the Supporting Infrastructure and Network Equipment, VPS next considered the network CPE devices, as shown in Table 10. Wilkes indicated that 1,303 housing units will be covered by the proposed fiber buildout, which results in 10,810 housing units out of the 11,813 housing units within Warren County to be covered with the wireless network. VPS has assumed a 30.0% penetration rate for the Revised CPE Cap-Ex Estimations, comparable for the industry average in a competitive market, such as Warren County.

VantagePoint
An Employee Owned Company

CBRS (3.5GHz) and U-NII (5GHz) Broadband Wireless Access (BWA)
REVISED - Projected Capital Expenses

Housing Units (July 2016 Estimates, US Census Bureau)		Housing Units to be Fiber Fed		
Housing Units within Warren County	11,813		30.0%	3,544
Adjusted Housing Units within Warren County	10,510	1303	30.0%	3,153

	CBRS (3.5GHz)		U-NII (5GHz)	
CPE Equipment	**Per Unit Costs**		**Per Unit Costs**	
CPE Devices	$ 500.00		$ 655.00	
Subtotals		**$ 1,576,500.00**		**$ 2,065,215.00**
Grand Total		**$ 1,576,500.00**		**$ 2,065,215.00**

Table 10 – Revised CPE Cap-Ex Estimation

Factoring the Revised Network Equipment and Revised CPE Cap-Ex estimations, resulting in a Cap-Ex Grand Total of **$5,322,150.00** to deploy a typical 3.5 GHz CBRS network and **$4,575,265.00** to deploy a typical 5 GHz U-NII unlicensed network utilizing seventeen colocation sites and one new pole site.

B. Revised Op-Ex Estimation

For a 3.5 GHz CBRS network, VPS has included in the following Revised Op-Ex summary in Table 11, showing the Support and Maintenance fees, along with the proposed site rental fees. VPS also included the SAS Support fees, which is currently a projection, as none of the seven tentatively approved SAS providers have detailed the exact costs they will charging for their support fees.

VantagePoint
An Employee Owned Company

Warren County
CBRS (3.5GHz) Fixed Wireless Access (FWA)
Projected Operating Expenses

	Term	Per Unit Costs	Annual Operating Expenses
Software Update, Warranty & Support (Annual)			
4-Sector AP Technical Support	18	$ 7,600.00	$ 136,800.00
Software Maintenance	18	$ 6,700.00	$ 120,600.00
SAS Support Fee (Projected, Annual)	18	$ 720.00	$ 12,960.00
DPI Platform Warranty & Support	--	$ -	$ -
Other Op-Ex			
Tower Site Rental ($1,250/Month/Site)	15	$ 1,250.00	$ 225,000.00
Water Tank/Tower Rental ($950/Month/Site)	2	$ 950.00	$ 22,800.00
Total Other Op-Ex (Annual)			**$ 518,160.00**

Table 11 – Revised CBRS Op-Ex

Most manufacturers with equipment for use in the 5 GHz U-NII bands do not offer annual support and maintenance contracts, but VPS has included the proposed site rental fees in the following Revised Op-Ex summary in Table 12.

VantagePoint
An Employee Owned Company

Warren County
U-NII (5GHz) Fixed Wireless Access (FWA)
Projected Operating Expenses

	Sites	Per Unit Costs	Annual Operating Expenses
Software Update, Warranty & Support (Annual)			
4-Sector AP Technical Support	--	$ -	$ -
DPI Platform Warranty & Support	--	$ -	$ -
Tower Site Rental ($1,250/Month/Site)	15	$ 1,250.00	$ 225,000.00
Other Op-Ex Water Tank/Tower Rental ($950/Month/Site)	2	$ 950.00	$ 22,800.00
Total Other Op-Ex (Annual)			**$ 247,800.00**

Table 12 – Revised Annual Op-Ex Summary

7. Conclusion

The above represents the high-level design and estimations representative of where and what infrastructure is currently available or will soon become available and where new infrastructure could be placed to maximize connectivity throughout Warren County. A network utilizing seventeen colocation sites and ten new pole sites with 3.5GHz CBRS bands or a 5 GHz unlicensed solution, resulted in Cap-Ex Grand Totals of **$7,335,803.00** and **$6,077,895.00**, respectively, to ultimately cover the residents and businesses outside Wilkes' proposed fiber optic ring within Warren County.

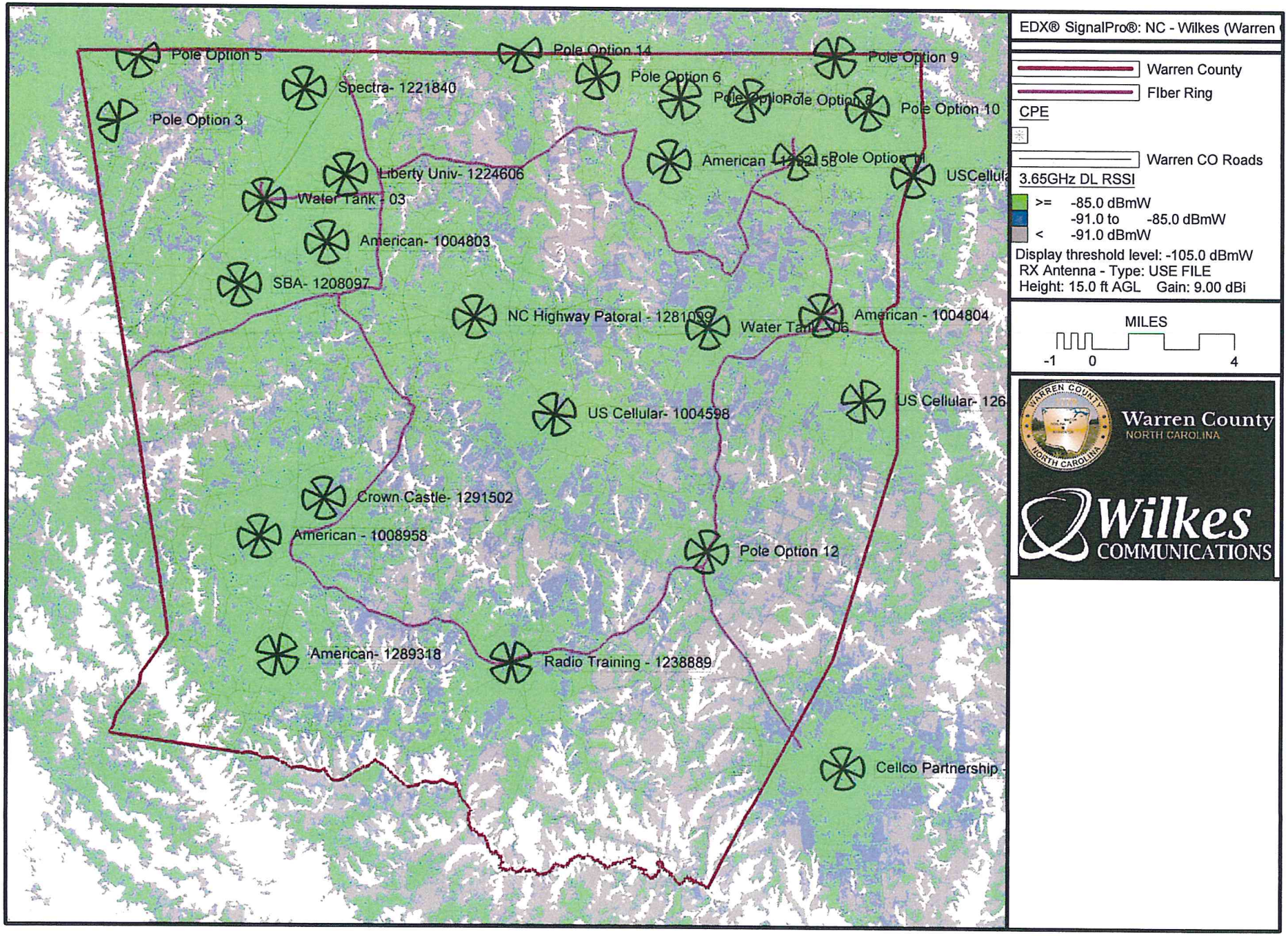
A network utilizing seventeen colocation sites and one new pole site with 3.5GHz CBRS bands or a 5 GHz unlicensed solution, resulted in Cap-Ex Grand Totals of **$5,322,150.00** and **$4,575,265.00**, respectively, to ultimately cover the residents and businesses outside Wilkes' proposed fiber optic ring within Warren County.

Should further studies be required, VPS will be happy to assist with any scaling or other "what-if" iterations that Wilkes or Warren County may require for its analysis.

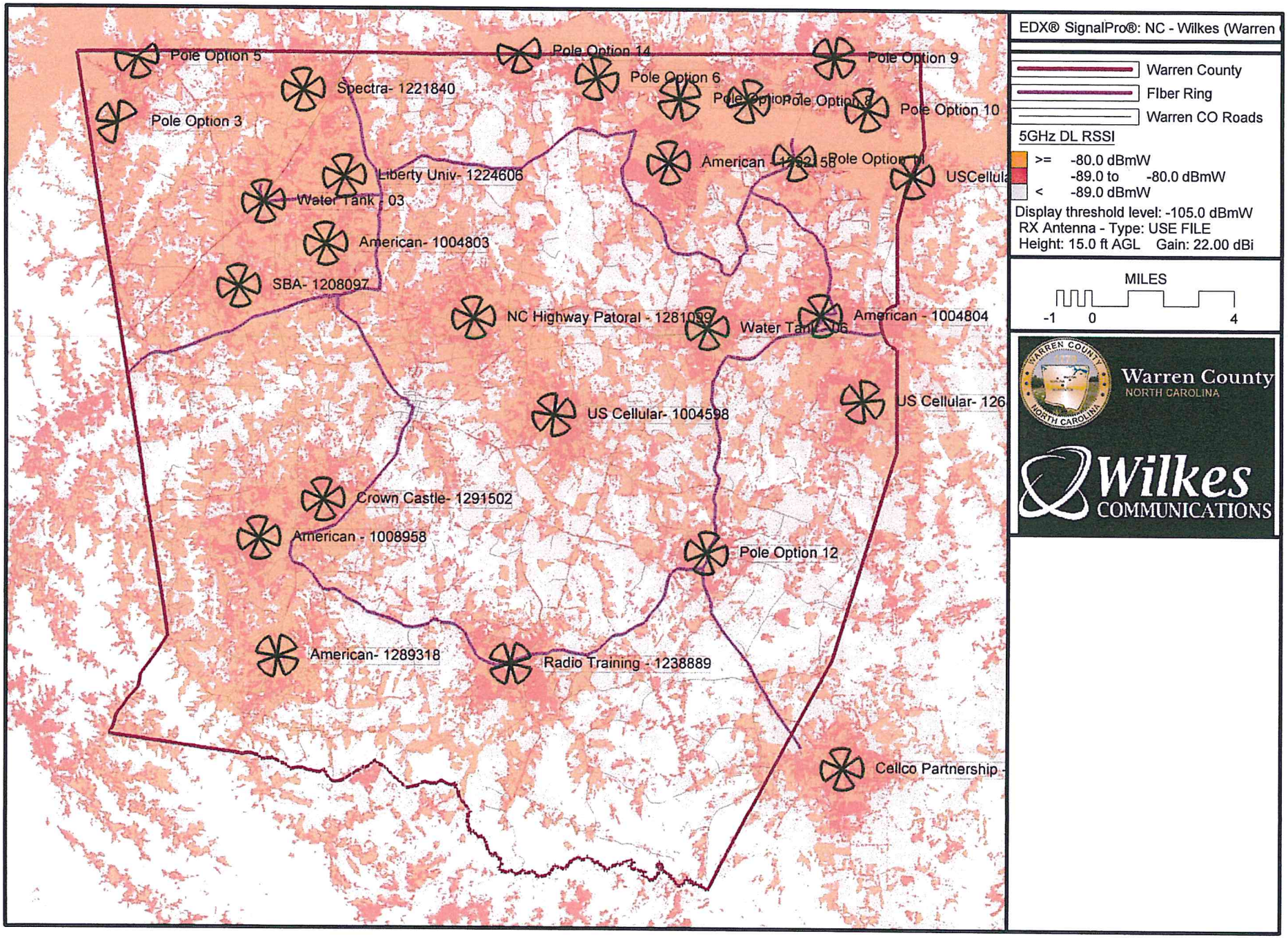
Thank you sincerely for the opportunity to be of service in this effort!

Appendix 1

A. Initial 3.5 GHz CBRS Band RF Prediction


Pole Option 5
Pole Option 14
Pole Option 9
Spectra- 1221840
Pole Option 6
Pole Option 3
Pole Option 10
American
Liberty Univ- 1224606
Water Tank - 03
American- 1004803
SBA- 1208097
NC Highway Patoral - 1281099
Water Tank - 06
American - 1004804
US Cellular- 1004598
US Cellular- 126
Crown Castle- 1291502
American - 1008958
Pole Option 12
American- 1289318
Radio Training - 1238889
Cellco Partnership -
EDX® SignalPro®: NC - Wilkes (Warren
Warren County
Fiber Ring
CPE
Warren CO Roads
3.65GHz DL RSSI
>= -85.0 dBmW
-91.0 to -85.0 dBmW
< -91.0 dBmW
Display threshold level: -105.0 dBmW
RX Antenna - Type: USE FILE
Height: 15.0 ft AGL Gain: 9.00 dBi
MILES
-1 0 4
Warren County
NORTH CAROLINA
Wilkes
COMMUNICATIONS

B. Initial 5 GHz U-NII Band RF Prediction


Pole Option 5
Pole Option 14
Pole Option 9
Spectra- 1221840
Pole Option 6
Pole Option 10
Pole Option 3
Liberty Univ- 1224606
American
Water Tank - 03
American- 1004803
SBA- 1208097
NC Highway Patoral - 1281099
Water Tank - 06
American - 1004804
US Cellular- 1004598
US Cellular- 126
Crown Castle- 1291502
American - 1008958
Pole Option 12
American- 1289318
Radio Training - 1238889
Cellco Partnership
EDX® SignalPro®: NC - Wilkes (Warren
Warren County
FIber Ring
Warren CO Roads
5GHz DL RSSI
>= -80.0 dBmW
-89.0 to -80.0 dBmW
< -89.0 dBmW
Display threshold level: -105.0 dBmW
RX Antenna - Type: USE FILE
Height: 15.0 ft AGL Gain: 22.00 dBi
MILES
-1 0 4
Warren County
NORTH CAROLINA
Wilkes
COMMUNICATIONS

C. Initial 3.5 GHz CBRS Band Cap-Ex Estimations

VantagePoint
An Employee Owned Company

CBRS (3.5GHz) Fixed Wireless Access (FWA) Project

Projected Capital Expenses

	Co-Lo CBRS(3.5GHz) Proposed Co-Lo Site 1 Collocation (Assume 2050)	Co-Lo CBRS(3.5GHz) Proposed Co-Lo Site 2 Collocation (Assume 2050)	Co-Lo CBRS(3.5GHz) Proposed Co-Lo Site 3 Collocation (Assume 2050)	Co-Lo CBRS(3.5GHz) Proposed Co-Lo Site 4 Collocation (Assume 2050)	Co-Lo CBRS(3.5GHz) Proposed Co-Lo Site 5 Collocation (Assume 2050)	Co-Lo CBRS(3.5GHz) Proposed Co-Lo Site 6 Collocation (Assume 2050)
Network Equipment						
Tower / Site	$ 29,200.00	$ 29,200.00	$ 29,200.00	$ 29,200.00	$ 29,200.00	$ 29,200.00
Site Acq, Planning, RF Survey - New Tower Sites	$ -	$ -	$ -	$ -	$ -	$ -
Site Acq, Planning, RF Survey - Co-Location Sites	$ 6,400.00	$ 6,400.00	$ 6,400.00	$ 6,400.00	$ 6,400.00	$ 6,400.00
Land (Purchase) - New Tower Sites	$ -	$ -	$ -	$ -	$ -	$ -
Tower Steel & Other Materials, Mounts, Hdwe	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00
Tower Foundation	$ -	$ -	$ -	$ -	$ -	$ -
Tower Erection/Tower Work	$ -	$ -	$ -	$ -	$ -	$ -
Site Civil / Make Ready	$ 7,500.00	$ 7,500.00	$ 7,500.00	$ 7,500.00	$ 7,500.00	$ 7,500.00
Hardened Cabinet, Complete	$ 13,800.00	$ 13,800.00	$ 13,800.00	$ 13,800.00	$ 13,800.00	$ 13,800.00
Antennas and Lines Installation	$ 18,600.00	$ 18,600.00	$ 18,600.00	$ 18,600.00	$ 18,600.00	$ 18,600.00
Antenna and Line Installation	$ 8,000.00	$ 8,000.00	$ 8,000.00	$ 8,000.00	$ 8,000.00	$ 8,000.00
On-Site Installation & Project Management	$ 3,200.00	$ 3,200.00	$ 3,200.00	$ 3,200.00	$ 3,200.00	$ 3,200.00
Antennas	$ 3,300.00	$ 3,300.00	$ 3,300.00	$ 3,300.00	$ 3,300.00	$ 3,300.00
Transmission Line & Hardware	$ 4,100.00	$ 4,100.00	$ 4,100.00	$ 4,100.00	$ 4,100.00	$ 4,100.00
Base Station Equipment	$ 28,900.00	$ 28,900.00	$ 28,900.00	$ 28,900.00	$ 28,900.00	$ 28,900.00
3650MHz Access Points (Quad Sectored)	$ 26,700.00	$ 26,700.00	$ 26,700.00	$ 26,700.00	$ 26,700.00	$ 26,700.00
Site Ancillary Equipment	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00
Server and Software License	$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00
Backhaul	$ 19,800.00	$ 44,800.00	$ 44,800.00	$ 57,300.00	$ 44,800.00	$ 44,800.00
Microwave Backhaul	$ -	$ -	$ -	$ -	$ -	$ -
Fiber Transport (Electronics)	$ 18,000.00	$ 18,000.00	$ 18,000.00	$ 18,000.00	$ 18,000.00	$ 18,000.00
Fiber Transport (Installation)	$ 1,800.00	$ 1,800.00	$ 1,800.00	$ 1,800.00	$ 1,800.00	$ 1,800.00
OSP Construction - Fiber Optic Cable	$ -	$ 25,000.00	$ 25,000.00	$ 37,500.00	$ 25,000.00	$ 25,000.00
Core Network	$ 57,400.00	$ 57,400.00	$ 57,400.00	$ 57,400.00	$ 57,400.00	$ 57,400.00
EPC	$ 33,600.00	$ 33,600.00	$ 33,600.00	$ 33,600.00	$ 33,600.00	$ 33,600.00
NMS and OSS System/Software	$ 23,800.00	$ 23,800.00	$ 23,800.00	$ 23,800.00	$ 23,800.00	$ 23,800.00
Network Equipment Spares	$ 7,500.00	$ 7,500.00	$ 7,500.00	$ 7,500.00	$ -	$ -
Engineering & Gen. Project Mgmt. Services	$ 24,300.00	$ 28,000.00	$ 28,000.00	$ 29,900.00	$ 26,900.00	$ 26,900.00
Subtotals	**$ 185,700.00**	**$ 214,400.00**	**$ 214,400.00**	**$ 228,800.00**	**$ 205,800.00**	**$ 205,800.00**

CPE Equipment	**Per Unit Costs**	
CPE Devices	$	500.00
3650MHz CPE Outdoor w/Antenna (As Required)	## $	220.00
CPE Ancillary Eqpt & Hardware (Common)	## $	130.00
CPE Install, Capitalized Labor/Truck Roll	## $	150.00
Complete - Subtotal, Network Equipment	**$**	**185,700.00**

VantagePoint
An Employee Owned Company

CBRS (3.5GHz) Fixed Wireless Access (FWA) Project

Projected Capital Expenses

Co-Lo CBRS(3.5GHz) Proposed Co-Lo Site 7 Collocation (Assume 2050)	Co-Lo CBRS(3.5GHz) Proposed Co-Lo Site 8 Collocation (Assume 2050)	Co-Lo CBRS(3.5GHz) Proposed Co-Lo Site 9 Collocation (Assume 2050)	Co-Lo CBRS(3.5GHz) Proposed Co-Lo Site 10 Collocation (Assume 2050)	Co-Lo CBRS(3.5GHz) Proposed Co-Lo Site 11 Collocation (Assume 2050)	Co-Lo CBRS(3.5GHz) Proposed Co-Lo Site 12 Collocation (Assume 2050)	Co-Lo CBRS(3.5GHz) Proposed Co-Lo Site 13 Collocation (Assume 2050)
$ 29,200.00	$ 29,200.00	$ 29,200.00	$ 29,200.00	$ 29,200.00	$ 29,200.00	$ 29,200.00
$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ 6,400.00	$ 6,400.00	$ 6,400.00	$ 6,400.00	$ 6,400.00	$ 6,400.00	$ 6,400.00
$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00
$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ 7,500.00	$ 7,500.00	$ 7,500.00	$ 7,500.00	$ 7,500.00	$ 7,500.00	$ 7,500.00
$ 13,800.00	$ 13,800.00	$ 13,800.00	$ 13,800.00	$ 13,800.00	$ 13,800.00	$ 13,800.00
$ 18,600.00	$ 18,600.00	$ 18,600.00	$ 18,600.00	$ 18,600.00	$ 18,600.00	$ 18,600.00
$ 8,000.00	$ 8,000.00	$ 8,000.00	$ 8,000.00	$ 8,000.00	$ 8,000.00	$ 8,000.00
$ 3,200.00	$ 3,200.00	$ 3,200.00	$ 3,200.00	$ 3,200.00	$ 3,200.00	$ 3,200.00
$ 3,300.00	$ 3,300.00	$ 3,300.00	$ 3,300.00	$ 3,300.00	$ 3,300.00	$ 3,300.00
$ 4,100.00	$ 4,100.00	$ 4,100.00	$ 4,100.00	$ 4,100.00	$ 4,100.00	$ 4,100.00
$ 28,900.00	$ 28,900.00	$ 28,900.00	$ 28,900.00	$ 28,900.00	$ 28,900.00	$ 28,900.00
$ 26,700.00	$ 26,700.00	$ 26,700.00	$ 26,700.00	$ 26,700.00	$ 26,700.00	$ 26,700.00
$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00
$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00
$ 57,300.00	$ 44,800.00	$ 57,300.00	$ 19,800.00	$ 19,800.00	$ 19,800.00	$ 30,000.00
$ -	$ -	$ -	$ -	$ -	$ -	$ 30,000.00
$ 18,000.00	$ 18,000.00	$ 18,000.00	$ 18,000.00	$ 18,000.00	$ 18,000.00	$ -
$ 1,800.00	$ 1,800.00	$ 1,800.00	$ 1,800.00	$ 1,800.00	$ 1,800.00	$ -
$ 37,500.00	$ 25,000.00	$ 37,500.00	$ -	$ -	$ -	$ -
$ 57,400.00	$ 57,400.00	$ 57,400.00	$ 57,400.00	$ 57,400.00	$ 57,400.00	$ 57,400.00
$ 33,600.00	$ 33,600.00	$ 33,600.00	$ 33,600.00	$ 33,600.00	$ 33,600.00	$ 33,600.00
$ 23,800.00	$ 23,800.00	$ 23,800.00	$ 23,800.00	$ 23,800.00	$ 23,800.00	$ 23,800.00
$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ 28,800.00	$ 26,900.00	$ 28,800.00	$ 23,100.00	$ 23,100.00	$ 23,100.00	$ 24,700.00
$ 220,200.00	**$ 205,800.00**	**$ 220,200.00**	**$ 177,000.00**	**$ 177,000.00**	**$ 177,000.00**	**$ 188,800.00**

VantagePoint
An Employee Owned Company

CBRS (3.5GHz) Fixed Wireless Access (FWA) Project
Projected Capital Expenses

Co-Lo CBRS (3.5GHz) Proposed Co-Lo Site 14 Collocation (Assume 2050)	Co-Lo CBRS (3.5GHz) Proposed Co-Lo Site 15 Collocation (Assume 2050)	Co-Lo CBRS (3.5GHz) Proposed Co-Lo Site 16 Collocation (Assume 2050)	Co-Lo CBRS (3.5GHz) Proposed Co-Lo Site 17 Collocation (Assume 2050)	New CBRS (3.5GHz) - Tri Proposed Pole 1 New Pole (Assume 65)	New CBRS (3.5GHz) - Tri Proposed Pole 2 New Pole (Assume 65)	New CBRS (3.5GHz) - Tri Proposed Pole 3 New Pole (Assume 65)
$ 29,200.00	$ 29,200.00	$ 29,200.00	$ 29,200.00	$ 97,700.00	$ 97,700.00	$ 97,700.00
$ -	$ -	$ -	$ -	$ 64,000.00	$ 64,000.00	$ 64,000.00
$ 6,400.00	$ 6,400.00	$ 6,400.00	$ 6,400.00	$ -	$ -	$ -
$ -	$ -	$ -	$ -	$ 2,500.00	$ 2,500.00	$ 2,500.00
$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 6,200.00	$ 6,200.00	$ 6,200.00
$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ -	$ -	$ -	$ -	$ 4,500.00	$ 4,500.00	$ 4,500.00
$ 7,500.00	$ 7,500.00	$ 7,500.00	$ 7,500.00	$ 7,500.00	$ 7,500.00	$ 7,500.00
$ 13,800.00	$ 13,800.00	$ 13,800.00	$ 13,800.00	$ 13,000.00	$ 13,000.00	$ 13,000.00
$ 18,600.00	$ 18,600.00	$ 18,600.00	$ 18,600.00	$ 15,100.00	$ 15,101.00	$ 15,102.00
$ 8,000.00	$ 8,000.00	$ 8,000.00	$ 8,000.00	$ 6,500.00	$ 6,500.00	$ 6,500.00
$ 3,200.00	$ 3,200.00	$ 3,200.00	$ 3,200.00	$ 3,200.00	$ 3,201.00	$ 3,202.00
$ 3,300.00	$ 3,300.00	$ 3,300.00	$ 3,300.00	$ 2,500.00	$ 2,500.00	$ 2,500.00
$ 4,100.00	$ 4,100.00	$ 4,100.00	$ 4,100.00	$ 2,900.00	$ 2,900.00	$ 2,900.00
$ 28,900.00	$ 28,900.00	$ 28,900.00	$ 28,900.00	$ 22,200.00	$ 22,200.00	$ 22,200.00
$ 26,700.00	$ 26,700.00	$ 26,700.00	$ 26,700.00	$ 20,000.00	$ 20,000.00	$ 20,000.00
$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00
$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00
$ 30,000.00	$ 30,000.00	$ 30,000.00	$ 30,000.00	$ 30,000.00	$ 30,000.00	$ 30,000.00
$ 30,000.00	$ 30,000.00	$ 30,000.00	$ 30,000.00	$ 30,000.00	$ 30,000.00	$ 30,000.00
$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ 57,400.00	$ 57,400.00	$ 57,400.00	$ 57,400.00	$ 57,400.00	$ 57,400.00	$ 57,400.00
$ 33,600.00	$ 33,600.00	$ 33,600.00	$ 33,600.00	$ 33,600.00	$ 33,600.00	$ 33,600.00
$ 23,800.00	$ 23,800.00	$ 23,800.00	$ 23,800.00	$ 23,800.00	$ 23,800.00	$ 23,800.00
$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ 24,700.00	$ 24,700.00	$ 24,700.00	$ 24,700.00	$ 33,400.00	$ 33,400.00	$ 33,400.00
$ 188,800.00	$ 188,800.00	$ 188,800.00	$ 188,800.00	$ 255,800.00	$ 255,801.00	$ 255,802.00

VantagePoint
An Employee Owned Company

CBRS (3.5GHz) Fixed Wireless Access (FWA) Project
Projected Capital Expenses

New CBRS (3.5GHz) - Quad Proposed Pole 4 New Pole (Assume 65')	New CBRS (3.5GHz) - Quad Proposed Pole 5 New Pole (Assume 65')	New CBRS (3.5GHz) - Quad Proposed Pole 6 New Pole (Assume 65')	New CBRS (3.5GHz) - Quad Proposed Pole 7 New Pole (Assume 65')	New CBRS (3.5GHz) - Quad Proposed Pole 8 New Pole (Assume 65')	New CBRS (3.5GHz) - Quad Proposed Pole 9 New Pole (Assume 45')
$ 97,700.00	$ 97,700.00	$ 97,700.00	$ 97,700.00	$ 97,700.00	$ 97,700.00
$ 64,000.00	$ 64,000.00	$ 64,000.00	$ 64,000.00	$ 64,000.00	$ 64,000.00
$ -	$ -	$ -	$ -	$ -	$ -
$ 2,500.00	$ 2,500.00	$ 2,500.00	$ 2,500.00	$ 2,500.00	$ 2,500.00
$ 6,200.00	$ 6,200.00	$ 6,200.00	$ 6,200.00	$ 6,200.00	$ 6,200.00
$ -	$ -	$ -	$ -	$ -	$ -
$ 4,500.00	$ 4,500.00	$ 4,500.00	$ 4,500.00	$ 4,500.00	$ 4,500.00
$ 7,500.00	$ 7,500.00	$ 7,500.00	$ 7,500.00	$ 7,500.00	$ 7,500.00
$ 13,000.00	$ 13,000.00	$ 13,000.00	$ 13,000.00	$ 13,000.00	$ 13,000.00
$ 16,600.00	$ 16,600.00	$ 16,600.00	$ 16,600.00	$ 16,600.00	$ 16,600.00
$ 6,500.00	$ 6,500.00	$ 6,500.00	$ 6,500.00	$ 6,500.00	$ 6,500.00
$ 3,200.00	$ 3,200.00	$ 3,200.00	$ 3,200.00	$ 3,200.00	$ 3,200.00
$ 3,300.00	$ 3,300.00	$ 3,300.00	$ 3,300.00	$ 3,300.00	$ 3,300.00
$ 3,600.00	$ 3,600.00	$ 3,600.00	$ 3,600.00	$ 3,600.00	$ 3,600.00
$ 28,900.00	$ 28,900.00	$ 28,900.00	$ 28,900.00	$ 28,900.00	$ 28,900.00
$ 26,700.00	$ 26,700.00	$ 26,700.00	$ 26,700.00	$ 26,700.00	$ 26,700.00
$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00
$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00
$ 30,000.00	$ 30,000.00	$ 30,000.00	$ 30,000.00	$ 19,800.00	$ 19,800.00
$ 30,000.00	$ 30,000.00	$ 30,000.00	$ 30,000.00	$ -	$ -
$ -	$ -	$ -	$ -	$ 18,000.00	$ 18,000.00
$ -	$ -	$ -	$ -	$ 1,800.00	$ 1,800.00
$ -	$ -	$ -	$ -	$ -	$ -
$ 57,400.00	$ 57,400.00	$ 57,400.00	$ 57,400.00	$ 57,400.00	$ 57,400.00
$ 33,600.00	$ 33,600.00	$ 33,600.00	$ 33,600.00	$ 33,600.00	$ 33,600.00
$ 23,800.00	$ 23,800.00	$ 23,800.00	$ 23,800.00	$ 23,800.00	$ 23,800.00
$ -	$ -	$ -	$ -	$ -	$ -
$ 34,600.00	$ 34,600.00	$ 34,600.00	$ 34,600.00	$ 33,100.00	$ 33,100.00
$ 265,200.00	$ 265,200.00	$ 265,200.00	$ 265,200.00	$ 253,500.00	$ 253,500.00

D. Initial 5 GHz U-NII Band Cap-Ex Estimations

VantagePoint
An Employee Owned Company

U-NII (5GHz) Fixed Wireless Access (FWA) Project
Projected Capital Expenses

	Co-Lo CBRS (3.5GHz) Proposed Co-Lo Site 1 Collocation (Assume 180')	Co-Lo CBRS (3.5GHz) Proposed Co-Lo Site 2 Collocation (Assume 180')	Co-Lo CBRS (3.5GHz) Proposed Co-Lo Site 3 Collocation (Assume 180')	Co-Lo CBRS (3.5GHz) Proposed Co-Lo Site 4 Collocation (Assume 180')	Co-Lo CBRS (3.5GHz) Proposed Co-Lo Site 5 Collocation (Assume 180')	Co-Lo CBRS (3.5GHz) Proposed Co-Lo Site 6 Collocation (Assume 180')
Network Equipment	*U-NII (5GHz) Fixed Wireless Access (FWA) Project*					
Tower / Site	$ 29,200.00	$ 29,200.00	$ 29,200.00	$ 29,200.00	$ 29,200.00	$ 29,200.00
Site Acq. Planning, RF Survey - New Tower Sites	$ -	$ -	$ -	$ -	$ -	$ -
Site Acq. Planning, RF Survey - Co-Location Sites	$ 6,400.00	$ 6,400.00	$ 6,400.00	$ 6,400.00	$ 6,400.00	$ 6,400.00
Land (Purchase) - New Tower Sites	$ -	$ -	$ -	$ -	$ -	$ -
Tower Steel & Other Materials, Mounts, Hdwe	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00
Tower Foundation	$ -	$ -	$ -	$ -	$ -	$ -
Tower Erection/Tower Work	$ -	$ -	$ -	$ -	$ -	$ -
Site Civil / Make Ready	$ 7,500.00	$ 7,500.00	$ 7,500.00	$ 7,500.00	$ 7,500.00	$ 7,500.00
Hardened Cabinet, Complete	$ 13,800.00	$ 13,800.00	$ 13,800.00	$ 13,800.00	$ 13,800.00	$ 13,800.00
Antennas and Lines Installation	$ 11,600.00	$ 11,600.00	$ 11,600.00	$ 11,600.00	$ 11,600.00	$ 11,600.00
Antenna and Line Installation	$ 8,000.00	$ 8,000.00	$ 8,000.00	$ 8,000.00	$ 8,000.00	$ 8,000.00
On-Site Installation & Project Management	$ 3,200.00	$ 3,200.00	$ 3,200.00	$ 3,200.00	$ 3,200.00	$ 3,200.00
Antennas	$ -	$ -	$ -	$ -	$ -	$ -
Transmission Line & Hardware	$ 400.00	$ 400.00	$ 400.00	$ 400.00	$ 400.00	$ 400.00
Base Station Equipment	$ 24,600.00	$ 24,600.00	$ 24,600.00	$ 24,600.00	$ 24,600.00	$ 24,600.00
5GHz Access Points (Quad Sectored)	$ 22,400.00	$ 22,400.00	$ 22,400.00	$ 22,400.00	$ 22,400.00	$ 22,400.00
Site Ancillary Equipment	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00
Server and Software License	$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00
Backhaul	$ 19,800.00	$ 44,800.00	$ 44,800.00	$ 57,300.00	$ 44,800.00	$ 44,800.00
Microwave Backhaul	$ -	$ -	$ -	$ -	$ -	$ -
Fiber Transport (Electronics)	$ 18,000.00	$ 18,000.00	$ 18,000.00	$ 18,000.00	$ 18,000.00	$ 18,000.00
Fiber Transport (Installation)	$ 1,800.00	$ 1,800.00	$ 1,800.00	$ 1,800.00	$ 1,800.00	$ 1,800.00
OSP Construction - Fiber Optic Cable	$ -	$ 25,000.00	$ 25,000.00	$ 37,500.00	$ 25,000.00	$ 25,000.00
Core Network	$ 9,200.00	$ 9,200.00	$ 9,200.00	$ 9,200.00	$ 9,200.00	$ 9,200.00
EPC	$ -	$ -	$ -	$ -	$ -	$ -
NMS and OSS System/Software	$ 9,200.00	$ 9,200.00	$ 9,200.00	$ 9,200.00	$ 9,200.00	$ 9,200.00
Network Equipment Spares	$ 5,600.00	$ 5,600.00	$ 5,600.00	$ 5,600.00	$ -	$ -
Engineering & Gen. Project Mgmt. Services	$ 15,000.00	$ 18,800.00	$ 18,800.00	$ 20,700.00	$ 18,000.00	$ 18,000.00
Subtotals	$ 115,000.00	$ 143,800.00	$ 143,800.00	$ 158,200.00	$ 137,400.00	$ 137,400.00

CPE Equipment	**Per Unit Costs**	
CPE Devices	$	500.00
3650MHz CPE Outdoor w/Antenna (As Required)	## $	220.00
CPE Ancillary Eqpt & Hardware (Common)	## $	130.00
CPE Install, Capitalized Labor/Truck Roll	## $	150.00
Complete - Subtotal, Network Equipment	$	115,000.00

VantagePoint
An Employee Owned Company

U-NII (5GHz) Fixed Wireless Access (FWA) Project

Projected Capital Expenses

Co-Lo CBRS (3.5GHz) Proposed Co-Lo Site 7 Collocation (Assume 180')	Co-Lo CBRS (3.5GHz) Proposed Co-Lo Site 8 Collocation (Assume 180')	Co-Lo CBRS (3.5GHz) Proposed Co-Lo Site 9 Collocation (Assume 180')	Co-Lo CBRS (3.5GHz) Proposed Co-Lo Site 10 Collocation (Assume 180')	Co-Lo CBRS (3.5GHz) Proposed Co-Lo Site 11 Collocation (Assume 180')	Co-Lo CBRS (3.5GHz) Proposed Co-Lo Site 12 Collocation (Assume 180')	Co-Lo CBRS (3.5GHz) Proposed Co-Lo Site 13 Collocation (Assume 180')
$ 29,200.00	$ 29,200.00	$ 29,200.00	$ 29,200.00	$ 29,200.00	$ 29,200.00	$ 29,200.00
$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ 6,400.00	$ 6,400.00	$ 6,400.00	$ 6,400.00	$ 6,400.00	$ 6,400.00	$ 6,400.00
$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00
$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ 7,500.00	$ 7,500.00	$ 7,500.00	$ 7,500.00	$ 7,500.00	$ 7,500.00	$ 7,500.00
$ 13,800.00	$ 13,800.00	$ 13,800.00	$ 13,800.00	$ 13,800.00	$ 13,800.00	$ 13,800.00
$ 11,600.00	$ 11,600.00	$ 11,600.00	$ 11,600.00	$ 11,600.00	$ 11,600.00	$ 11,600.00
$ 8,000.00	$ 8,000.00	$ 8,000.00	$ 8,000.00	$ 8,000.00	$ 8,000.00	$ 8,000.00
$ 3,200.00	$ 3,200.00	$ 3,200.00	$ 3,200.00	$ 3,200.00	$ 3,200.00	$ 3,200.00
$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ 400.00	$ 400.00	$ 400.00	$ 400.00	$ 400.00	$ 400.00	$ 400.00
$ 24,600.00	$ 24,600.00	$ 24,600.00	$ 24,600.00	$ 24,600.00	$ 24,600.00	$ 24,600.00
$ 22,400.00	$ 22,400.00	$ 22,400.00	$ 22,400.00	$ 22,400.00	$ 22,400.00	$ 22,400.00
$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00
$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00
$ 57,300.00	$ 44,800.00	$ 57,300.00	$ 19,800.00	$ 19,800.00	$ 19,800.00	$ 30,000.00
$ -	$ -	$ -	$ -	$ -	$ -	$ 30,000.00
$ 18,000.00	$ 18,000.00	$ 18,000.00	$ 18,000.00	$ 18,000.00	$ 18,000.00	$ -
$ 1,800.00	$ 1,800.00	$ 1,800.00	$ 1,800.00	$ 1,800.00	$ 1,800.00	$ -
$ 37,500.00	$ 25,000.00	$ 37,500.00	$ -	$ -	$ -	$ -
$ 9,200.00	$ 9,200.00	$ 9,200.00	$ 9,200.00	$ 9,200.00	$ 9,200.00	$ 9,200.00
$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ 9,200.00	$ 9,200.00	$ 9,200.00	$ 9,200.00	$ 9,200.00	$ 9,200.00	$ 9,200.00
$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ 19,800.00	$ 18,000.00	$ 19,800.00	$ 14,200.00	$ 14,200.00	$ 14,200.00	$ 15,700.00
$ 151,700.00	**$ 137,400.00**	**$ 151,700.00**	**$ 108,600.00**	**$ 108,600.00**	**$ 108,600.00**	**$ 120,300.00**

VantagePoint
An Employee Owned Company

U-NII (5GHz) Fixed Wireless Access (FWA) Project

Projected Capital Expenses

Co-Lo CBRS (3.5GHz) Proposed Co-Lo Site 14 Collocation (Assume 180')	Co-Lo CBRS (3.5GHz) Proposed Co-Lo Site 15 Collocation (Assume 180')	Co-Lo CBRS (3.5GHz) Proposed Co-Lo Site 16 Collocation (Assume 180')	Co-Lo CBRS (3.5GHz) Proposed Co-Lo Site 17 Collocation (Assume 180')	New CBRS (3.5GHz) - Tri Proposed Pole 1 New Pole (Assume 65')	New CBRS (3.5GHz) - Tri Proposed Pole 2 New Pole (Assume 65')	New CBRS (3.5GHz) - Tri Proposed Pole 3 New Pole (Assume 65')
$ 29,200.00	$ 29,200.00	$ 29,200.00	$ 29,200.00	$ 97,700.00	$ 97,700.00	$ 97,700.00
$ -	$ -	$ -	$ -	$ 64,000.00	$ 64,000.00	$ 64,000.00
$ 6,400.00	$ 6,400.00	$ 6,400.00	$ 6,400.00	$ -	$ -	$ -
$ -	$ -	$ -	$ -	$ 2,500.00	$ 2,500.00	$ 2,500.00
$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 6,200.00	$ 6,200.00	$ 6,200.00
$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ -	$ -	$ -	$ -	$ 4,500.00	$ 4,500.00	$ 4,500.00
$ 7,500.00	$ 7,500.00	$ 7,500.00	$ 7,500.00	$ 7,500.00	$ 7,500.00	$ 7,500.00
$ 13,800.00	$ 13,800.00	$ 13,800.00	$ 13,800.00	$ 13,000.00	$ 13,000.00	$ 13,000.00
$ 11,600.00	$ 11,600.00	$ 11,600.00	$ 11,600.00	$ 11,300.00	$ 11,300.00	$ 11,300.00
$ 8,000.00	$ 8,000.00	$ 8,000.00	$ 8,000.00	$ 8,000.00	$ 8,000.00	$ 8,000.00
$ 3,200.00	$ 3,200.00	$ 3,200.00	$ 3,200.00	$ 3,200.00	$ 3,200.00	$ 3,200.00
$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ 400.00	$ 400.00	$ 400.00	$ 400.00	$ 100.00	$ 100.00	$ 100.00
$ 24,600.00	$ 24,600.00	$ 24,600.00	$ 24,600.00	$ 19,000.00	$ 19,000.00	$ 19,000.00
$ 22,400.00	$ 22,400.00	$ 22,400.00	$ 22,400.00	$ 16,800.00	$ 16,800.00	$ 16,800.00
$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00
$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00
$ 30,000.00	$ 30,000.00	$ 30,000.00	$ 30,000.00	$ 30,000.00	$ 30,000.00	$ 30,000.00
$ 30,000.00	$ 30,000.00	$ 30,000.00	$ 30,000.00	$ 30,000.00	$ 30,000.00	$ 30,000.00
$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ 9,200.00	$ 9,200.00	$ 9,200.00	$ 9,200.00	$ 9,200.00	$ 9,200.00	$ 9,200.00
$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ 9,200.00	$ 9,200.00	$ 9,200.00	$ 9,200.00	$ 9,200.00	$ 9,200.00	$ 9,200.00
$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ 15,700.00	$ 15,700.00	$ 15,700.00	$ 15,700.00	$ 25,100.00	$ 25,100.00	$ 25,100.00
$ 120,300.00	**$ 120,300.00**	**$ 120,300.00**	**$ 120,300.00**	**$ 192,300.00**	**$ 192,300.00**	**$ 192,300.00**

VantagePoint
An Employee Owned Company

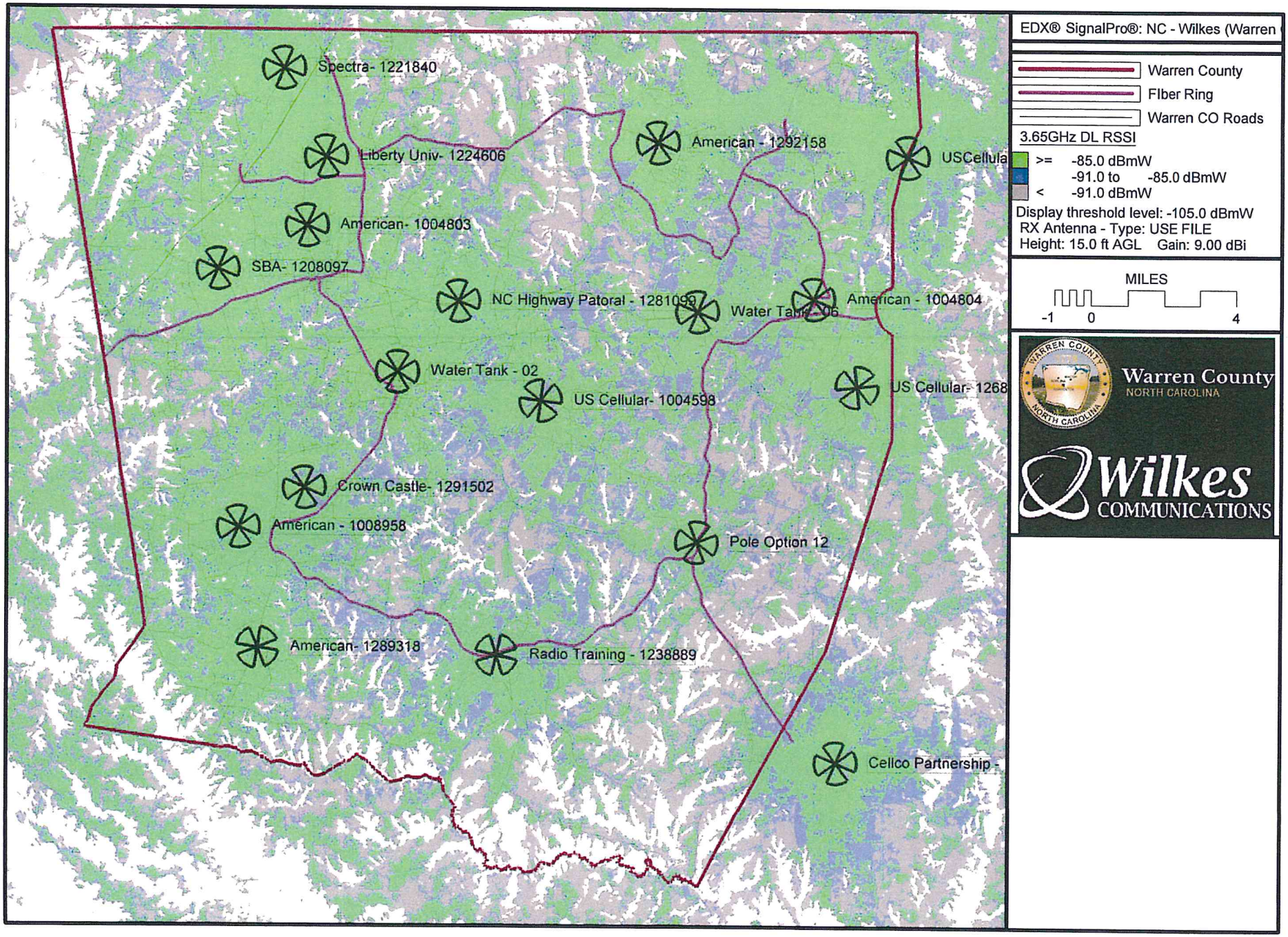
U-NII (5GHz) Fixed Wireless Access (FWA) Project

Projected Capital Expenses

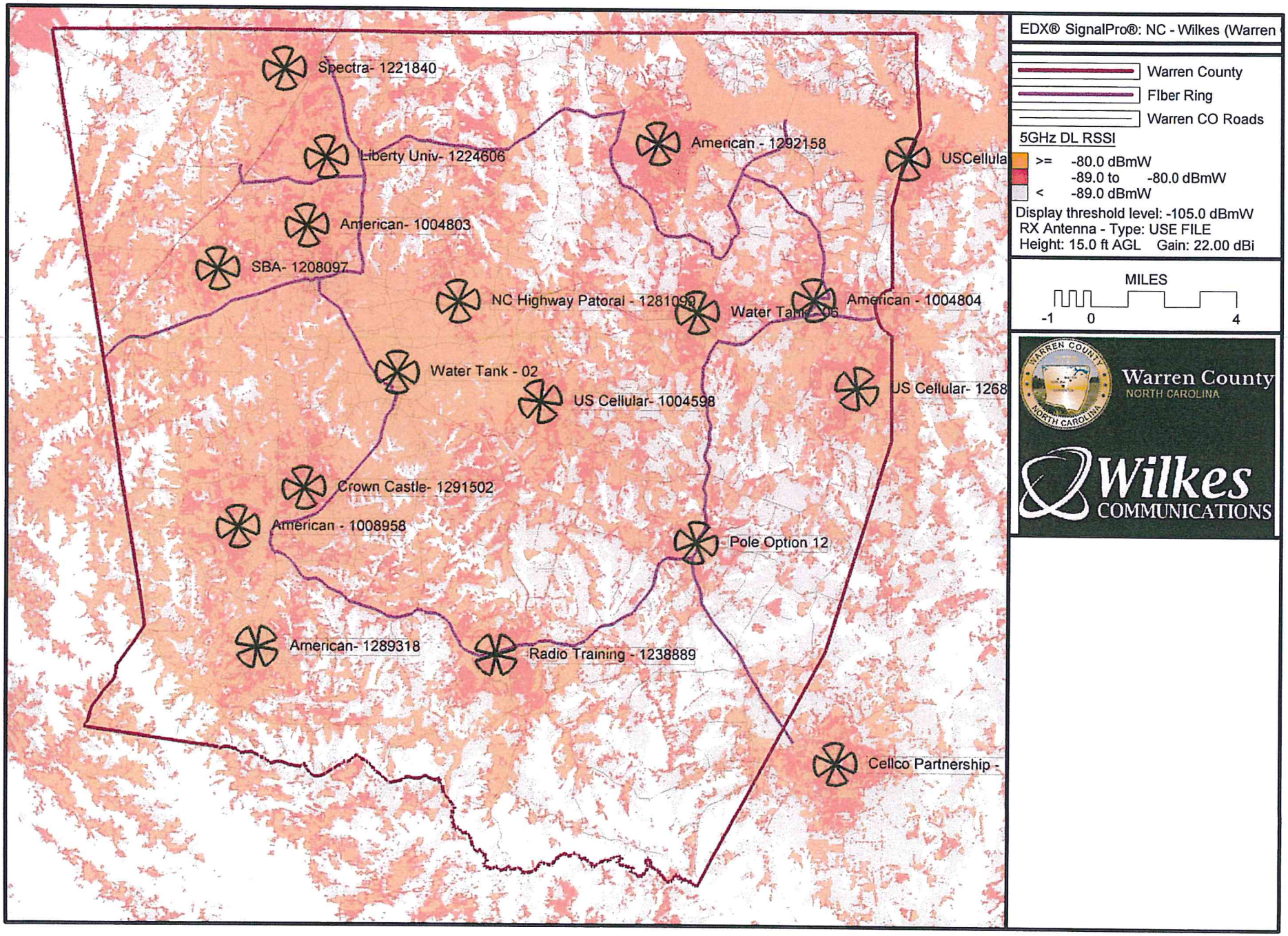
New CBRS (3.5GHz) - Quad Proposed Pole 4 New Pole (Assume 65')	New CBRS (3.5GHz) - Quad Proposed Pole 5 New Pole (Assume 65')	New CBRS (3.5GHz) - Quad Proposed Pole 6 New Pole (Assume 65')	New CBRS (3.5GHz) - Quad Proposed Pole 7 New Pole (Assume 65')	New CBRS (3.5GHz) - Quad Proposed Pole 8 New Pole (Assume 65')	New CBRS (3.5GHz) - Quad Proposed Pole 9 New Pole (Assume 65')
$ 97,700.00	$ 97,700.00	$ 97,700.00	$ 97,700.00	$ 97,700.00	$ 97,700.00
$ 64,000.00	$ 64,000.00	$ 64,000.00	$ 64,000.00	$ 64,000.00	$ 64,000.00
$ -	$ -	$ -	$ -	$ -	$ -
$ 2,500.00	$ 2,500.00	$ 2,500.00	$ 2,500.00	$ 2,500.00	$ 2,500.00
$ 6,200.00	$ 6,200.00	$ 6,200.00	$ 6,200.00	$ 6,200.00	$ 6,200.00
$ -	$ -	$ -	$ -	$ -	$ -
$ 4,500.00	$ 4,500.00	$ 4,500.00	$ 4,500.00	$ 4,500.00	$ 4,500.00
$ 7,500.00	$ 7,500.00	$ 7,500.00	$ 7,500.00	$ 7,500.00	$ 7,500.00
$ 13,000.00	$ 13,000.00	$ 13,000.00	$ 13,000.00	$ 13,000.00	$ 13,000.00
$ 11,300.00	$ 11,300.00	$ 11,300.00	$ 11,300.00	$ 11,300.00	$ 11,300.00
$ 8,000.00	$ 8,000.00	$ 8,000.00	$ 8,000.00	$ 8,000.00	$ 8,000.00
$ 3,200.00	$ 3,200.00	$ 3,200.00	$ 3,200.00	$ 3,200.00	$ 3,200.00
$ -	$ -	$ -	$ -	$ -	$ -
$ 100.00	$ 100.00	$ 100.00	$ 100.00	$ 100.00	$ 100.00
$ 24,600.00	$ 24,600.00	$ 24,600.00	$ 24,600.00	$ 24,600.00	$ 24,600.00
$ 22,400.00	$ 22,400.00	$ 22,400.00	$ 22,400.00	$ 22,400.00	$ 22,400.00
$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00
$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00
$ 30,000.00	$ 30,000.00	$ 30,000.00	$ 30,000.00	$ 19,800.00	$ 19,800.00
$ 30,000.00	$ 30,000.00	$ 30,000.00	$ 30,000.00	$ -	$ -
$ -	$ -	$ -	$ -	$ 18,000.00	$ 18,000.00
$ -	$ -	$ -	$ -	$ 1,800.00	$ 1,800.00
$ -	$ -	$ -	$ -	$ -	$ -
$ 9,200.00	$ 9,200.00	$ 9,200.00	$ 9,200.00	$ 9,200.00	$ 9,200.00
$ -	$ -	$ -	$ -	$ -	$ -
$ 9,200.00	$ 9,200.00	$ 9,200.00	$ 9,200.00	$ 9,200.00	$ 9,200.00
$ -	$ -	$ -	$ -	$ -	$ -
$ 26,000.00	$ 26,000.00	$ 26,000.00	$ 26,000.00	$ 24,400.00	$ 24,400.00
$ 198,800.00	**$ 198,800.00**	**$ 198,800.00**	**$ 198,800.00**	**$ 187,000.00**	**$ 187,000.00**

Appendix 2

A. Revised 3.5 GHz CBRS Band RF Prediction


Spectra- 1221840
Liberty Univ- 1224606
American - 1292158
USCellula
American- 1004803
SBA- 1208097
NC Highway Patoral - 1281099
Water Tank - 06
American - 1004804
Water Tank - 02
US Cellular- 1004598
US Cellular- 1268
Crown Castle- 1291502
American - 1008958
Pole Option 12
American- 1289318
Radio Training - 1238889
Cellco Partnership -
EDX® SignalPro®: NC - Wilkes (Warren
Warren County
Fiber Ring
Warren CO Roads
3.65GHz DL RSSI
>= -85.0 dBmW
-91.0 to -85.0 dBmW
< -91.0 dBmW
Display threshold level: -105.0 dBmW
RX Antenna - Type: USE FILE
Height: 15.0 ft AGL Gain: 9.00 dBi
MILES
-1 0 4
Warren County
NORTH CAROLINA
Wilkes
COMMUNICATIONS

B. Revised 5 GHz U-NII Band RF Prediction


Spectra- 1221840
Liberty Univ- 1224606
American - 1292158
USCellula
American- 1004803
SBA- 1208097
NC Highway Patoral - 1281090
Water Tank - 06
American - 1004804
Water Tank - 02
US Cellular- 1004598
US Cellular- 1268
Crown Castle- 1291502
American - 1008958
Pole Option 12
American- 1289318
Radio Training - 1238889
Cellco Partnership -
EDX® SignalPro®: NC - Wilkes (Warren
Warren County
FIber Ring
Warren CO Roads
5GHz DL RSSI
>= -80.0 dBmW
-89.0 to -80.0 dBmW
< -89.0 dBmW
Display threshold level: -105.0 dBmW
RX Antenna - Type: USE FILE
Height: 15.0 ft AGL Gain: 22.00 dBi
MILES
-1 0 4
Warren County
NORTH CAROLINA
Wilkes
COMMUNICATIONS

C. Revised 3.5 GHz CBRS Band Cap-Ex Estimations

VantagePoint
An Employee Owned Company

CBRS (3.5GHz) Fixed Wireless Access (FWA) Project

Projected Capital Expenses

		Co-Lo CBRS (3.5GHz) Proposed Co-Lo Site 1 Collocation (Assume 10th)	Co-Lo CBRS (3.5GHz) Proposed Co-Lo Site 2 Collocation (Assume 16th)	Co-Lo CBRS (3.5GHz) Proposed Co-Lo Site 3 Collocation (Assume 20th)	Co-Lo CBRS (3.5GHz) Proposed Co-Lo Site 4 Collocation (Assume 20th)	Co-Lo CBRS (3.5GHz) Proposed Co-Lo Site 5 Collocation (Assume 20th)	Co-Lo CBRS (3.5GHz) Proposed Co-Lo Site 6 Collocation (Assume 20th)
Network Equipment							
Tower / Site	$	29,200.00 $	29,200.00 $	29,200.00 $	29,200.00 $	29,200.00 $	29,200.00
Site Acq. Planning, RF Survey - New Tower Sites	$	- $	- $	- $	- $	- $	-
Site Acq. Planning, RF Survey - Co-Location Sites	$	6,400.00 $	6,400.00 $	6,400.00 $	6,400.00 $	6,400.00 $	6,400.00
Land (Purchase) - New Tower Sites	$	- $	- $	- $	- $	- $	-
Tower Steel & Other Materials, Mounts, Hdwe	$	1,500.00 $	1,500.00 $	1,500.00 $	1,500.00 $	1,500.00 $	1,500.00
Tower Foundation	$	- $	- $	- $	- $	- $	-
Tower Erection/Tower Work	$	- $	- $	- $	- $	- $	-
Site Civil / Make Ready	$	7,500.00 $	7,500.00 $	7,500.00 $	7,500.00 $	7,500.00 $	7,500.00
Hardened Cabinet, Complete	$	13,800.00 $	13,800.00 $	13,800.00 $	13,800.00 $	13,800.00 $	13,800.00
Antennas and Lines Installation	$	18,500.00 $	18,400.00 $	18,600.00 $	18,600.00 $	18,600.00 $	18,600.00
Antenna and Line Installation	$	8,000.00 $	8,000.00 $	8,000.00 $	8,000.00 $	8,000.00 $	8,000.00
On-Site Installation & Project Management	$	3,200.00 $	3,200.00 $	3,200.00 $	3,200.00 $	3,200.00 $	3,200.00
Antennas	$	3,300.00 $	3,300.00 $	3,300.00 $	3,300.00 $	3,300.00 $	3,300.00
Transmission Line & Hardware	$	4,000.00 $	3,900.00 $	4,100.00 $	4,100.00 $	4,100.00 $	4,100.00
Base Station Equipment	$	28,900.00 $	28,900.00 $	28,900.00 $	28,900.00 $	28,900.00 $	28,900.00
3650MHz Access Points (Quad Sectored)	$	26,700.00 $	26,700.00 $	26,700.00 $	26,700.00 $	26,700.00 $	26,700.00
Site Ancillary Equipment	$	1,500.00 $	1,500.00 $	1,500.00 $	1,500.00 $	1,500.00 $	1,500.00
Server and Software License	$	700.00 $	700.00 $	700.00 $	700.00 $	700.00 $	700.00
Backhaul	$	19,800.00 $	47,300.00 $	60,550.00 $	51,050.00 $	51,050.00 $	51,050.00
Microwave Backhaul	$	- $	- $	- $	- $	- $	-
Fiber Transport (Electronics)	$	18,000.00 $	18,000.00 $	18,000.00 $	18,000.00 $	18,000.00 $	18,000.00
Fiber Transport (Installation)	$	1,800.00 $	1,800.00 $	1,800.00 $	1,800.00 $	1,800.00 $	1,800.00
OSP Construction - Fiber Optic Cable	$	- $	27,500.00 $	40,750.00 $	31,250.00 $	31,250.00 $	31,250.00
Core Network	$	57,400.00 $	57,400.00 $	57,400.00 $	57,400.00 $	57,400.00 $	57,400.00
EPC	$	33,600.00 $	33,600.00 $	33,600.00 $	33,600.00 $	33,600.00 $	33,600.00
NMS and OSS System/Software	$	23,800.00 $	23,800.00 $	23,800.00 $	23,800.00 $	23,800.00 $	23,800.00
Network Equipment Spares	$	7,500.00 $	7,500.00 $	7,500.00 $	7,500.00 $	- $	-
Engineering & Gen. Project Mgmt. Services	$	24,200.00 $	28,400.00 $	30,400.00 $	28,900.00 $	27,800.00 $	27,800.00
Subtotals	$	**185,500.00** $	**217,100.00** $	**232,550.00** $	**221,550.00** $	**212,950.00** $	**212,950.00**

		Per Unit Costs	
CPE Equipment			
CPE Devices		$	500.00
3650MHz CPE Outdoor w/Antenna (As Required)	##	$	220.00
CPE Ancillary Eqpt & Hardware (Common)	##	$	130.00
CPE Install, Capitalized Labor/Truck Roll	##	$	150.00
Complete - Subtotal, Network Equipment		$	**3,745,650.00**

VantagePoint
An Employee Owned Company

CBRS (3.5GHz) Fixed Wireless Access (FWA) Project

Projected Capital Expenses

Co-Lo CBRS (3.5GHz) Proposed Co-Lo Site 7 Collocation (Assume 2025)	Co-Lo CBRS (3.5GHz) Proposed Co-Lo Site 8 Collocation (Assume 2025)	Co-Lo CBRS (3.5GHz) Proposed Co-Lo Site 9 Collocation (Assume 2025)	Co-Lo CBRS (3.5GHz) Proposed Co-Lo Site 10 Collocation (Assume 2025)	Co-Lo CBRS (3.5GHz) Proposed Co-Lo Site 11 Collocation (Assume 2025)	Co-Lo CBRS (3.5GHz) Proposed Co-Lo Site 12 Collocation (Assume 2025)	Co-Lo CBRS (3.5GHz) Proposed Co-Lo Site 13 Collocation (Assume 2025)
$ 29,200.00	$ 29,200.00	$ 29,200.00	$ 29,200.00	$ 29,200.00	$ 29,200.00	$ 29,200.00
$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ 6,400.00	$ 6,400.00	$ 6,400.00	$ 6,400.00	$ 6,400.00	$ 6,400.00	$ 6,400.00
$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00
$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ 7,500.00	$ 7,500.00	$ 7,500.00	$ 7,500.00	$ 7,500.00	$ 7,500.00	$ 7,500.00
$ 13,800.00	$ 13,800.00	$ 13,800.00	$ 13,800.00	$ 13,800.00	$ 13,800.00	$ 13,800.00
$ 18,600.00	$ 18,600.00	$ 18,600.00	$ 18,600.00	$ 18,600.00	$ 18,600.00	$ 18,600.00
$ 8,000.00	$ 8,000.00	$ 8,000.00	$ 8,000.00	$ 8,000.00	$ 8,000.00	$ 8,000.00
$ 3,200.00	$ 3,200.00	$ 3,200.00	$ 3,200.00	$ 3,200.00	$ 3,200.00	$ 3,200.00
$ 3,300.00	$ 3,300.00	$ 3,300.00	$ 3,300.00	$ 3,300.00	$ 3,300.00	$ 3,300.00
$ 4,100.00	$ 4,100.00	$ 4,100.00	$ 4,100.00	$ 4,100.00	$ 4,100.00	$ 4,100.00
$ 28,900.00	$ 28,900.00	$ 28,900.00	$ 28,900.00	$ 28,900.00	$ 28,900.00	$ 28,900.00
$ 26,700.00	$ 26,700.00	$ 26,700.00	$ 26,700.00	$ 26,700.00	$ 26,700.00	$ 26,700.00
$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00
$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00
$ 51,050.00	$ 49,800.00	$ 32,300.00	$ 57,300.00	$ 68,550.00	$ 26,050.00	$ 36,300.00
$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ 18,000.00	$ 18,000.00	$ 18,000.00	$ 18,000.00	$ 18,000.00	$ 18,000.00	$ 18,000.00
$ 1,800.00	$ 1,800.00	$ 1,800.00	$ 1,800.00	$ 1,800.00	$ 1,800.00	$ 1,800.00
$ 31,250.00	$ 30,000.00	$ 12,500.00	$ 37,500.00	$ 48,750.00	$ 6,250.00	$ 16,500.00
$ 57,400.00	$ 57,400.00	$ 57,400.00	$ 57,400.00	$ 57,400.00	$ 57,400.00	$ 57,400.00
$ 33,600.00	$ 33,600.00	$ 33,600.00	$ 33,600.00	$ 33,600.00	$ 33,600.00	$ 33,600.00
$ 23,800.00	$ 23,800.00	$ 23,800.00	$ 23,800.00	$ 23,800.00	$ 23,800.00	$ 23,800.00
$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ 27,800.00	$ 27,600.00	$ 25,000.00	$ 28,800.00	$ 30,400.00	$ 24,100.00	$ 25,600.00
$ 212,950.00	$ 211,500.00	$ 191,400.00	$ 220,200.00	$ 233,050.00	$ 184,250.00	$ 196,000.00

VantagePoint
An Employee Owned Company

CBRS (3.5GHz) Fixed Wireless Access (FWA) Project

Projected Capital Expenses

Co-Lo CBRS (3.5GHz) Proposed Co-Lo Site 14 Collocation (Assume 205')	Co-Lo CBRS (3.5GHz) Proposed Co-Lo Site 15 Collocation (Assume 205')	Co-Lo CBRS (3.5GHz) Proposed Co-Lo Site 16 Collocation (Assume 205')	Co-Lo CBRS (3.5GHz) Proposed Co-Lo Site 17 Collocation (Assume 205')	New CBRS (3.5GHz) - Quad Proposed Pole 1 New Pole (Assume 65')
$ 29,200.00	$ 29,200.00	$ 29,200.00	$ 29,200.00	$ 97,700.00
$ -	$ -	$ -	$ -	$ 64,000.00
$ 6,400.00	$ 6,400.00	$ 6,400.00	$ 6,400.00	$ -
$ -	$ -	$ -	$ -	$ 2,500.00
$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 6,200.00
$ -	$ -	$ -	$ -	$ -
$ -	$ -	$ -	$ -	$ 4,500.00
$ 7,500.00	$ 7,500.00	$ 7,500.00	$ 7,500.00	$ 7,500.00
$ 13,800.00	$ 13,800.00	$ 13,800.00	$ 13,800.00	$ 13,000.00
$ 18,600.00	$ 18,600.00	$ 18,600.00	$ 18,600.00	$ 15,100.00
$ 8,000.00	$ 8,000.00	$ 8,000.00	$ 8,000.00	$ 6,500.00
$ 3,200.00	$ 3,200.00	$ 3,200.00	$ 3,200.00	$ 3,200.00
$ 3,300.00	$ 3,300.00	$ 3,300.00	$ 3,300.00	$ 2,500.00
$ 4,100.00	$ 4,100.00	$ 4,100.00	$ 4,100.00	$ 2,900.00
$ 28,900.00	$ 28,900.00	$ 28,900.00	$ 28,900.00	$ 22,200.00
$ 26,700.00	$ 26,700.00	$ 26,700.00	$ 26,700.00	$ 20,000.00
$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00
$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00
$ 30,000.00	$ 30,000.00	$ 30,000.00	$ 30,000.00	$ 32,300.00
$ 30,000.00	$ 30,000.00	$ 30,000.00	$ 30,000.00	$ -
$ -	$ -	$ -	$ -	$ 18,000.00
$ -	$ -	$ -	$ -	$ 1,800.00
$ -	$ -	$ -	$ -	$ 12,500.00
$ 57,400.00	$ 57,400.00	$ 57,400.00	$ 57,400.00	$ 57,400.00
$ 33,600.00	$ 33,600.00	$ 33,600.00	$ 33,600.00	$ 33,600.00
$ 23,800.00	$ 23,800.00	$ 23,800.00	$ 23,800.00	$ 23,800.00
$ -	$ -	$ -	$ -	$ -
$ 24,700.00	$ 24,700.00	$ 24,700.00	$ 24,700.00	$ 33,800.00
$ 188,800.00	$ 188,800.00	$ 188,800.00	$ 188,800.00	$ 258,500.00

D. Revised 5 GHz U-NII Band Cap-Ex Estimations

VantagePoint
An Employee Owned Company

U-NII (5GHz) Fixed Wireless Access (FWA) Project

Projected Capital Expenses

	Co-Lo CBRS (3.5GHz) Proposed Co-Lo Site 1 Collocation (Assume 80%)	Co-Lo CBRS (3.5GHz) Proposed Co-Lo Site 2 Collocation (Assume 65%)	Co-Lo CBRS (3.5GHz) Proposed Co-Lo Site 3 Collocation (Assume 85%)	Co-Lo CBRS (3.5GHz) Proposed Co-Lo Site 4 Collocation (Assume 95%)	Co-Lo CBRS (3.5GHz) Proposed Co-Lo Site 5 Collocation (Assume 95%)	Co-Lo CBRS (3.5GHz) Proposed Co-Lo Site 6 Collocation (Assume 95%)
Network Equipment	*U-NII (5GHz) Fixed Wireless Access (FWA) Project*					
Tower / Site	$ 29,200.00	$ 29,200.00	$ 29,200.00	$ 29,200.00	$ 29,200.00	$ 29,200.00
Site Acq, Planning, RF Survey - New Tower Sites	$ -	$ -	$ -	$ -	$ -	$ -
Site Acq, Planning, RF Survey - Co-Location Sites	$ 6,400.00	$ 6,400.00	$ 6,400.00	$ 6,400.00	$ 6,400.00	$ 6,400.00
Land (Purchase) - New Tower Sites	$ -	$ -	$ -	$ -	$ -	$ -
Tower Steel & Other Materials, Mounts, Hdwe	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00
Tower Foundation	$ -	$ -	$ -	$ -	$ -	$ -
Tower Erection/Tower Work	$ -	$ -	$ -	$ -	$ -	$ -
Site Civil / Make Ready	$ 7,500.00	$ 7,500.00	$ 7,500.00	$ 7,500.00	$ 7,500.00	$ 7,500.00
Hardened Cabinet, Complete	$ 13,800.00	$ 13,800.00	$ 13,800.00	$ 13,800.00	$ 13,800.00	$ 13,800.00
Antennas and Lines Installation	$ 11,500.00	$ 11,500.00	$ 11,600.00	$ 11,600.00	$ 11,600.00	$ 11,600.00
Antenna and Line Installation	$ 8,000.00	$ 8,000.00	$ 8,000.00	$ 8,000.00	$ 8,000.00	$ 8,000.00
On-Site Installation & Project Management	$ 3,200.00	$ 3,200.00	$ 3,200.00	$ 3,200.00	$ 3,200.00	$ 3,200.00
Antennas	$ -	$ -	$ -	$ -	$ -	$ -
Transmission Line & Hardware	$ 300.00	$ 300.00	$ 400.00	$ 400.00	$ 400.00	$ 400.00
Base Station Equipment	$ 24,600.00	$ 24,600.00	$ 24,600.00	$ 24,600.00	$ 24,600.00	$ 24,600.00
5GHz Access Points (Quad Sectored)	$ 22,400.00	$ 22,400.00	$ 22,400.00	$ 22,400.00	$ 22,400.00	$ 22,400.00
Site Ancillary Equipment	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00
Server and Software License	$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00
Backhaul	$ 19,800.00	$ 47,300.00	$ 60,550.00	$ 51,050.00	$ 51,050.00	$ 51,050.00
Microwave Backhaul	$ -	$ -	$ -	$ -	$ -	$ -
Fiber Transport (Electronics)	$ 18,000.00	$ 18,000.00	$ 18,000.00	$ 18,000.00	$ 18,000.00	$ 18,000.00
Fiber Transport (Installation)	$ 1,800.00	$ 1,800.00	$ 1,800.00	$ 1,800.00	$ 1,800.00	$ 1,800.00
OSP Construction - Fiber Optic Cable	$ -	$ 27,500.00	$ 40,750.00	$ 31,250.00	$ 31,250.00	$ 31,250.00
Core Network	$ 9,200.00	$ 9,200.00	$ 9,200.00	$ 9,200.00	$ 9,200.00	$ 9,200.00
EPC	$ -	$ -	$ -	$ -	$ -	$ -
NMS and OSS System/Software	$ 9,200.00	$ 9,200.00	$ 9,200.00	$ 9,200.00	$ 9,200.00	$ 9,200.00
Network Equipment Spares	$ 5,600.00	$ 5,600.00	$ 5,600.00	$ 5,600.00	$ -	$ -
Engineering & Gen. Project Mgmt. Services	$ 15,000.00	$ 19,200.00	$ 21,200.00	$ 19,700.00	$ 18,900.00	$ 18,900.00
Subtotals	$ 114,900.00	$ 146,600.00	$ 161,950.00	$ 150,950.00	$ 144,550.00	$ 144,550.00

CPE Equipment	**Per Unit Costs**	
CPE Devices	$	500.00
3650MHz CPE Outdoor w/Antenna (As Required)	# $	220.00
CPE Ancillary Eqpt & Hardware (Common)	# $	130.00
CPE Install, Capitalized Labor/Truck Roll	# $	150.00

Complete - Subtotal, Network Equipment $ **2,510,050.00**

VantagePoint
An Employee Owned Company

U-NII (5GHz) Fixed Wireless Access (FWA) Project

Projected Capital Expenses

Co-Lo CBRS (3.5GHz) Proposed Co-Lo Site 7 Collocation (Assume 2025)	Co-Lo CBRS (3.5GHz) Proposed Co-Lo Site 8 Collocation (Assume 2025)	Co-Lo CBRS (3.5GHz) Proposed Co-Lo Site 9 Collocation (Assume 2025)	Co-Lo CBRS (3.5GHz) Proposed Co-Lo Site 10 Collocation (Assume 2025)	Co-Lo CBRS (3.5GHz) Proposed Co-Lo Site 11 Collocation (Assume 2025)	Co-Lo CBRS (3.5GHz) Proposed Co-Lo Site 12 Collocation (Assume 2025)	Co-Lo CBRS (3.5GHz) Proposed Co-Lo Site 13 Collocation (Assume 2025)
$ 29,200.00	$ 29,200.00	$ 29,200.00	$ 29,200.00	$ 29,200.00	$ 29,200.00	$ 29,200.00
$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ 6,400.00	$ 6,400.00	$ 6,400.00	$ 6,400.00	$ 6,400.00	$ 6,400.00	$ 6,400.00
$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00
$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ 7,500.00	$ 7,500.00	$ 7,500.00	$ 7,500.00	$ 7,500.00	$ 7,500.00	$ 7,500.00
$ 13,800.00	$ 13,800.00	$ 13,800.00	$ 13,800.00	$ 13,800.00	$ 13,800.00	$ 13,800.00
$ 11,600.00	$ 11,600.00	$ 11,600.00	$ 11,600.00	$ 11,600.00	$ 11,600.00	$ 11,600.00
$ 8,000.00	$ 8,000.00	$ 8,000.00	$ 8,000.00	$ 8,000.00	$ 8,000.00	$ 8,000.00
$ 3,200.00	$ 3,200.00	$ 3,200.00	$ 3,200.00	$ 3,200.00	$ 3,200.00	$ 3,200.00
$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ 400.00	$ 400.00	$ 400.00	$ 400.00	$ 400.00	$ 400.00	$ 400.00
$ 24,600.00	$ 24,600.00	$ 24,600.00	$ 24,600.00	$ 24,600.00	$ 24,600.00	$ 24,600.00
$ 22,400.00	$ 22,400.00	$ 22,400.00	$ 22,400.00	$ 22,400.00	$ 22,400.00	$ 22,400.00
$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00
$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00
$ 51,050.00	$ 49,800.00	$ 32,300.00	$ 57,300.00	$ 68,550.00	$ 26,950.00	$ 36,300.00
$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ 18,000.00	$ 18,000.00	$ 18,000.00	$ 18,000.00	$ 18,000.00	$ 18,000.00	$ 18,000.00
$ 1,800.00	$ 1,800.00	$ 1,800.00	$ 1,800.00	$ 1,800.00	$ 1,800.00	$ 1,800.00
$ 31,250.00	$ 30,000.00	$ 12,500.00	$ 37,500.00	$ 48,750.00	$ 6,250.00	$ 16,500.00
$ 9,200.00	$ 9,200.00	$ 9,200.00	$ 9,200.00	$ 9,200.00	$ 9,200.00	$ 9,200.00
$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ 9,200.00	$ 9,200.00	$ 9,200.00	$ 9,200.00	$ 9,200.00	$ 9,200.00	$ 9,200.00
$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ 18,900.00	$ 18,700.00	$ 16,100.00	$ 19,800.00	$ 21,500.00	$ 15,100.00	$ 16,700.00
$ 144,550.00	$ 143,100.00	$ 123,000.00	$ 151,700.00	$ 164,650.00	$ 115,750.00	$ 127,600.00

VantagePoint
An Employee Owned Company

U-NII (5GHz) Fixed Wireless Access (FWA) Project

Projected Capital Expenses

Co-Lo CBRS (3.5GHz) Proposed Co-Lo Site 14 Collocation (Assume 205')	Co-Lo CBRS (3.5GHz) Proposed Co-Lo Site 15 Collocation (Assume 205')	Co-Lo CBRS (3.5GHz) Proposed Co-Lo Site 16 Collocation (Assume 205')	Co-Lo CBRS (3.5GHz) Proposed Co-Lo Site 17 Collocation (Assume 205')	New CBRS (3.5GHz) - Tri Proposed Pole 1 New Pole (Assume 65')
$ 29,200.00	$ 29,200.00	$ 29,200.00	$ 29,200.00	$ 97,700.00
$ -	$ -	$ -	$ -	$ 64,000.00
$ 6,400.00	$ 6,400.00	$ 6,400.00	$ 6,400.00	$ -
$ -	$ -	$ -	$ -	$ 2,500.00
$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 6,200.00
$ -	$ -	$ -	$ -	$ -
$ -	$ -	$ -	$ -	$ 4,500.00
$ 7,500.00	$ 7,500.00	$ 7,500.00	$ 7,500.00	$ 7,500.00
$ 13,800.00	$ 13,800.00	$ 13,800.00	$ 13,800.00	$ 13,000.00
$ 11,600.00	$ 11,600.00	$ 11,600.00	$ 11,600.00	$ 11,300.00
$ 8,000.00	$ 8,000.00	$ 8,000.00	$ 8,000.00	$ 8,000.00
$ 3,200.00	$ 3,200.00	$ 3,200.00	$ 3,200.00	$ 3,200.00
$ -	$ -	$ -	$ -	$ -
$ 400.00	$ 400.00	$ 400.00	$ 400.00	$ 100.00
$ 24,600.00	$ 24,600.00	$ 24,600.00	$ 24,600.00	$ 19,000.00
$ 22,400.00	$ 22,400.00	$ 22,400.00	$ 22,400.00	$ 16,800.00
$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00
$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00
$ 30,000.00	$ 30,000.00	$ 30,000.00	$ 30,000.00	$ 32,300.00
$ 30,000.00	$ 30,000.00	$ 30,000.00	$ 30,000.00	$ -
$ -	$ -	$ -	$ -	$ 18,000.00
$ -	$ -	$ -	$ -	$ 1,800.00
$ -	$ -	$ -	$ -	$ 12,500.00
$ 9,200.00	$ 9,200.00	$ 9,200.00	$ 9,200.00	$ 9,200.00
$ -	$ -	$ -	$ -	$ -
$ 9,200.00	$ 9,200.00	$ 9,200.00	$ 9,200.00	$ 9,200.00
$ -	$ -	$ -	$ -	$ -
$ 15,700.00	$ 15,700.00	$ 15,700.00	$ 15,700.00	$ 25,500.00
$ 120,300.00	$ 120,300.00	$ 120,300.00	$ 120,300.00	$ 195,000.00

Section 14

ERIC S. CRAMER

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OBJECTIVE

My goal is to attain a challenging and rewarding executive position with a firm in the areas of telecommunications, accounting and finance. This position should enable me to utilize and expand my existing 20+ years of knowledge and experience in the field of information and telecommunications technology as well as offer the continued opportunity for growth as an executive. It is my objective to pursue a position that will allow me to build, lead, educate and promote a positive and productive team environment and direct the vision and mission of the company. I aspire to continue to establish and maintain beneficial, profitable and long-standing relationships with all stakeholders of the company that provides positive results to the financial standing of the company as well as the community it serves.

EXPERIENCE

WILKES TELEPHONE MEMBERSHIP CORPORATION
dba - WILKES COMMUNICATIONS - Wilkesboro, North Carolina

Chief Executive Officer – 2/2010 – Present

Chief Financial Officer and Assistant General Manager – 8/2005 – 2/2010

Chief Financial Officer – 1/2005 – 2/2010

WILKES COMMUNICATIONS, INC. (a subsidiary of Wilkes TMC)
RIVERSTREET NETWORKS (a trade name of Wilkes Communications)

President and Chief Executive Officer – 2/2010 - Present

Management responsibilities including the following:

- Management, training and evaluation of supervisory personnel for multiple departments
- Project management, delegation, tracking and monitoring for multiple departments
- Preparation, presentation, and oversight of company financial statements and budget
- Development and maintenance of business plan and strategic vision
- Maintenance of company tariffs and retail pricing
- Completion and submission of various regulatory filings
- Evaluation and analysis of major purchasing and borrowing decisions
- Represent the company in various industry associations and collaborative efforts

- Interface with Union and participate in Labor Relations and Negotiations
- Asset evaluation and acquisition
- Establish structures that foster innovation
- Promote and ensure ethical, safe, and legal operations

JOHN STAURULAKIS, INC., - Seabrook, Maryland

Staff Consultant - Revenue Requirements - 1/2004 – 12/2004

Consultant - Revenue Requirements - 1/2001-12/2003

Senior Analyst - Revenue Requirements - 1/1999-12/2000

Staff Analyst - Revenue Requirements - 11/1996-12/1998

Supervisory responsibilities including the following:

- Management, training and evaluation of personnel
- Task management, delegation, tracking and monitoring for a consulting group
- Tariff development, Carrier Access Billing
- Strategic planning, on site client management and staff training
- Primary responsibility for interfacing with and supporting client relationships with 23 Independent Local Exchange Carrier clients located in AL, AR, CO, FL, GA, KY, MS, NC, NY, PA, SC, WV, VA, and VT
- Submission of information to the FCC, USAC, and NECA.
- Development and submission of High Cost Support for ILECs including HCLF, ICLS, and LSS.
- Completion and submission of various FCC Forms and Filings (499, 492, etc.)
- Interaction with various state and federal regulatory agencies
- Central Office and Cable & Wire Equipment Basic Studies and Allocations
- Part 32/64 and 36/69 accounting
- Budgeting and Forecasting
- Earnings Performance Monitoring Reports, Revenue Assurance
- Jurisdictional Separations Cost Study, Revenue Requirement, and Jurisdictional Traffic Factor development

EDUCATION

University of Maryland University College – Adelphi, Maryland
Master of Business Administration - May, 2005

University of Maryland University College – Adelphi, Maryland
Master of Science - Technology Management - December, 2004

Shippensburg University of Pennsylvania - Shippensburg, Pennsylvania
Bachelors of Science of Business Administration – Finance - December, 1995

MERITS and SERVICE

ACCOMPLISHMENTS

- Launch of a successful CLEC and new service lines – IPTV, security, business class (wireless – pending)
- Implementation of a 10yr strategic planning process including a 5yr budget and forecast for parent and 5 subsidiaries including corporate and departmental goals and metrics
- Completed an entire all active IP based FTTH network overbuild with 1Gig speeds to every subscriber in our cooperative and CLEC service footprint
- Recently completed a 6,000 sq ft production studio/ workspace and launch of a local IPTV channel
- Continuous growth in all major metric categories
    - Revenues - $14M to $45M - +221%
    - Subscriber RGUs – 16K to 46K – +187.5%
    - Reduced Loaded Cost Per Employee - $108K per to $48K - -55.5%
    - Enterprise Value - $44M to $64M - +46%
- Successful acquisition of all major anchor and a majority of key accounts in our core market
- Leading a Public Private Partnership in Stokes County, NC with county stakeholders – building a 110 mile fiber network to serve underserved and unserved residents
- Recent successful acquisition of three independent rural ILECs in NC from TDS Telecom– Saluda Mountain Tel, Barnardsville Tel and Service Tel – 2015
- Pending merger with TriCounty TMC – 2018
- Pending acquisition of Ellerbe Telephone Company – 2018
- Pending acquisition of Peoples Mutual Telephone Company from Consolidated Communications - 2018
- Negotiation of four collective bargaining agreements resulting in decreases in overheads and added operational flexibility
- Development of a highly effective management team fostering a culture of accountability, trust, engagement and growth
- Development of a corporate wide rebranding effort

INDUSTRY - MERITS / SERVICE

National Telecommunications Cooperative Association - NTCA

NTCA Excellence in Management Innovation Award Winner - 2016
NTCA Excellence in Leadership Award Winner – 2006/2007, 2008/2009, 2009/2010
NTCA Association Services Committee – 2010 to 2011
NTCA Wireless Industry Committee – 2011 to 2013 – Vice Chair 2013
NTCA Industry Regulatory and Policy Committee – 2014 to Present
NTCA Deferred Comp Trust Committee – 2014 to Present
NTCA Futures Group – 2016 to Present

North Carolina E-911 Board

North Carolina E-911 Board of Directors – 2014 to Present
NC-911 Next Gen Committee
NC-911 Grant Committee

North Carolina Rural Electrification – NCREA

North Carolina REA Board of Directors – 2017 to Present

National Exchange Carrier Association – NECA

Rate Development Task Group

Foundation for Rural Services - FRS

FRS Board of Directors – 2012 to Present (Vice Chairman)

Carolina Virginias Telephone Membership Association - CVTMA

CVTMA Board of Directors – 2010 to Present

NC Co-Op Regulatory Issues Workgroup – 2005 to Present

NC Broadband Matters

Board of Directors – February 2018 to Present

North Carolina Telephone Cooperative Coalition – NCTCC (Carolina Link)

Carolina Link Board of Directors – 2010 to Present

North Carolina Telecommunications Industry Association - NCTIA

NCTIA Business Operations Committee – 2005 to 2011 (Chair 2009-2011)

NCTIA Regulatory, Legislative and Policy Committee – 2005 to 2013

NCTIA Board of Directors – 2010 to 2013 – 2015-2016 - Vice Chair 2013

Cooperative Council of North Carolina

NC-Cooperative Council Board of Directors – 2010 to 2013

Carolina West Wireless, Inc. - CWW

CWW Board of Directors – 2010 to Present

CWW Audit Committee – 2006 to Present

CWW Compensation and Strategic Planning Committee – 2010 to Present

Clear Stream Communications, LLC Board of Directors – 2011 to 2014

Visions West, LLC

Visions West Board of Directors – 2010 to Present

Access-On Multi-Media Corp.

Access-On Board of Directors – 2010 to Present - (President and Chairman)

Eastern Rural Telecom Association - ERTA

ERTA Board of Directors – 2010 to 2013 – Vice Chair 2013

The Data Center, Inc. – TDC

TDC Board of Directors – 2009 to 2013

Member of the Association of RUS Telephone Accountants – 2005 to 2011

Member of the American Management Association – 2005 to 2011

Biltmore "Who's Who" of Executive Professionals Clemmons, NC – 2008/2009

COMMUNITY – MERITS / SERVICE

Wilkes County Chamber of Commerce

Wilkes County Chamber of Commerce Board of Directors – 2007 to Present

Wilkes County Chamber of Commerce – Vice Pres of Youth Leadership – 2006 to 2015

Wilkes County Chamber - Leadership Alumni – 2007

United Way of Wilkes County

United Way of Wilkes County Board of Directors – 2010 to 2014

United Way of Wilkes County Outstanding Loaned Executive Award Winner – 2005/2006

United Way of Wilkes County Loaned Executive – 2005/2006

WTMC United Way Campaign Chair – 2005

Wilkes Circles of Care – WCOC

Wilkes Circles of Care Board of Directors – 2012 to 2014 – Board Liaison

Wilkes Economic Development Corporation

Wilkes EDC Board of Directors – 2012 to Present (Vice Chairman)

Wilkes Regional Medical Center – WRMC
WRMC Board of Directors – 2012 to Present (Chairman)
Better Business Bureau of Northwest North Carolina
BBB of NW NC Board of Directors – 2013 to Present
March of Dimes March for Babies of Wilkes County – Campaign Co-Chair - 2014

INDIVIDUAL / COMPANY MERITS

- NTCA – The Rural Broadband Association – Excellence in Management Innovation Award – 2017
- NTCA – The Rural Broadband Association - PR Net and Marketing Tele-Choice Award – Website – RiverStreet Networks - 2017
- NTCA - The Rural Broadband Association – Gigabit Capable Provider Certification - 2014
- NTCA - The Rural Broadband Association – Smart Rural Community Trailblazer Award - 2013
- Wilkes County Chamber of Commerce Excellence in Business Award – 2017
- United Way Above & Beyond Award -2010/2011 Campaign
- Cooperative Council of North Carolina Coop Service Award – 2011
- USDA RUS Broadband Initiatives Program (BIP) $21M Infrastructure Grant Award - 2010
- Duke Energy Citizenship and Service Award – 2010
- Wilkes County Chamber of Commerce Excellence in Small Business Award – 2005

SKILLS

- Successful negotiation, financing, transition and integration of multiple telecom systems acquisitions and merger
- Labor negotiations
- Understanding of federal and state telecommunications regulation
- Understanding of the development of the revenue streams of cost and average schedule based ILECs as well as federal and state support mechanisms such as HCLF, ICLS, and LSS
- Development of cost based tariffed access rates for ILECs as well as a complete understanding of both Switched and Special Access Carrier Access Billing
- Understanding of the fields of Local and Wide Area Networks, Fixed Wire-Line and Wireless Telecommunications, Internet Technologies, Financial and Organizational Performance Management, Project Management, Knowledge Management, Systems Analysis, Research and Design, and Systems Acquisition Management
- Economic Analysis, Strategic Planning and Board Relations
- Capital Budgeting and Forecasting, and Asset Valuation
- Preparation of financial statements
- Knowledge of RUS borrowing and requirements
- Pricing and profitability analysis
- Overall understanding of cooperative operations including - capital credits, customer service, marketing, pricing, service orders, trouble tickets, sales and management

COMPUTER AND SPECIALIZED SKILLS

- Microsoft Office environment and Visio
- Google Platform
- Departmental training sessions including Fiber Optic Network Design and Digital Subscriber Line, etc.
- Public speaking
- Cost analysis and valuation
- Pricing of Unbundled Network Elements
- Equipment analysis for the ILEC, CLEC, Wireless and Cable industries
- TSLERIC, TELRIC and Embedded Cost studies
- Earnings Surveillance, Cash Flow and Profitability Analysis

TRAINING

- BB&T Leadership Institute - 2015
- OSHA Compliance and Safety Training – First Aid – March 2005 (Safety Net, Inc.)
- OSHA Record Keeping – February 2007 (Randolph Community College - CED)
- The Dynamics of Developing Leadership Skills for Success – March 2007 (People & Solutions, Inc.)
- OSHA Compliance and Safety Training – Hazard Communications – March 2007 (Safety Net, Inc.)
- FMLA Update – May 2007 (Supervisory Development Institute – WCI)
- Developing People Skills – June 2007 (Supervisory Development Institute – WCI)
- Leadership – November 2007 (Wilkes Community College – CED)
- OSHA Compliance and Safety Training – OSHA Compliance Workshop – June 2008 (Safety Net, Inc.)
- CPNI Compliance, FTC Red Flag, HIPPA

REFERENCES

Jody R. Call

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Wilkesboro, NC 28697
Home: 336-984-2489
Mobile: 336-467-2388
jodycall@myriverstreet.net

EDUCATION

Wilkes Community College, A.A.S., Electronics Engineering
Gardner-Webb University, B.S., Human Services, Summa Cum Laude Appalachian State University, M.A. Ed., Educational Media/Information Systems
North Carolina A&T State University, Graduate/Professional Studies: Information Systems

PROFESSIONAL CERTIFICATIONS

CCNA Routing and Switching Certification (ID #CSCO12200593)
ITIL Foundation Certification in IT Service Management (ID #GR750059889JC)
CompTIA Security+ Certification (ID #COMP001020769076)

PROFESSIONAL EXPERIENCE

01/2018 - Present: Wilkes Communications | RiverStreet Networks: Chief Technology Officer

- Manage Operational, Network, and IT migrations resulting from 5 acquisitions and 1 merger, effectively doubling the size of the company from 11,000 voice lines, 6,500 broadband accounts, and 2,500 TV accounts to 23,000 voice lines, 14,000 broadband accounts, and 5,500 TV accounts.
- Develop and manage staff and project timelines for continued subscriber growth including: Commercial Wi-Fi, FTTH deployments and overbuilds, and infrastructure and system upgrades.
- Establish a new communications company in Stokes County, NC, branded as RiverStreet Networks – Stokes. This project effectively created a new FTTH service area for underserved residents and businesses whereby Gigabit broadband services are actively being deployed.
- Author narratives and summaries of RFPs, RFNs, RFIs, and other business-related inquiries to offer broadband services in rural areas within NC and VA by utilizing fixed-wireless, Wi-Fi, DSL, RF, and FTTH technologies.
- Work with staff and engineering consultants on acquiring Connect America Funding, Community Connect Funding, and grants from local governments to offer broadband in rural areas in NC and VA.
- Develop NC Apprenticeship program in coordination with Wilkes County Schools and Wilkes Community College as a hiring line for skilled qualified technical labor in several departments at Wilkes Communications | RiverStreet Networks.

08/2015 - 12/2017: Wilkes Communications | RiverStreet Networks: Director of Network Operations

- Developed and implemented an organizational restructure to combine Network Support, Network Services, Network Operations, IT and Security, and Business Services.
- Developed and provided periodic technical training/educational sessions for employees.
- Completed BB&T Leadership Awareness Program of Study (formerly Farr Associates) and implemented personal, one-on-one employee leadership plans for direct reports.
- Increased employee job satisfaction and engagement by clearly defining roles and responsibilities and establishing career paths.
- Implement in-house tech support solution to reduce operational expenditure by $500,000 annually while creating jobs for the local community and economy.
- Analyze potential acquisitions, partnerships, and growth strategies and develop project plans and a rolling 10-year budget for these opportunities.
- Design Fiber-to-the-Home solutions for local, regional, and statewide towns, counties, and municipalities.
- Design and Engineer a Fiber-to-the-Home solution for 3 recently-acquired LECs to make them Gigabit-capable communities.
- Increase entire company's security infrastructure through access control systems, video-surveillance, and establishment of modern IT and security policies.

08/2012 - 07/2015: Wilkes Telecommunications: Network Operations Manager

- Acquired departments of IT and Security, Carrier Access Billing, and Operational Support.
- Developed an effective leadership plan, organizational structure, and positive culture.
- Developed ongoing professional development plan and rubric with each direct report.
- Developed training regimen for Network Operations employees and other departmental employees.
- Created and managed departmental and company goals to develop and maintain scalable network solutions.
- Completed Fiber-to-the-Home project in 2014 which overbuilt 9,200+ customers with 1 Gbps-capable connectivity.
- Ensured 99.999% service delivery and efficient operation of overall network.
- Managed acquisition, transition, and integration of newly-purchased LEC properties to broaden service area and footprint of Wilkes Communications and RiverStreet Networks, effectively adding 3,000+ additional subscribers.
- Managed and integrated conversion from legacy billing platform to a new OSS/BSS platform.
- Migrated Microsoft Exchange e-mail services to Google Apps for Business.
- Developed project management and timeline accountability for efficient workflow.
- Oversaw staff assigned to develop and support Wilkes' Broadband and Voice Products including Internet Services, Digital TV, Special-Access Ethernet, and VoIP.
- Analyzed data, studies, and reports to determine areas of growth, recession, and where

improvements were needed.
- Designed and implemented Metro Ethernet and Ethernet Transport Service network for mobile carriers, hospitals, education, and government allowing for 10 Gbps connectivity.

08/2010 - 07/2012: Wilkes Telecommunications: Network Operations Supervisor

- Managed combined departments of Network Support and Network Operations.
- Managed Wilkes' data center and 60+ remote sites/offices.
- Managed and oversaw design, installation, and maintenance of DC power plant, HVAC, environmental controls, UPS, and generators at NOC/data center and all sites.
- Acted as a liaison to other rural telecommunications cooperatives for training and education programs.
- Prepared technical roadmap for 4-year, $21 million government-funded fiber overbuild project to provide Gigabit fiber connectivity to remaining Wilkes customers.
- Managed annual Network Operations budget for equipment purchases, staff training, hiring, maintenance, and upgrades.
- Deployed softswitch solution and migrated subscribers from legacy digital switching platform.
- Managed engineers and technicians who provide installation and support of routing, switching, telephony, Digital TV, T1, and other special access services.
- Managed Wilkes' ISP and Broadband Products.
- Successfully developed and implemented a change in design for the fiber overbuild project to save the company $7.2 million over the span of 3 years.

01/2009 - 08/2010: Wilkes Telecommunications: Network Support Services Supervisor

- Managed Network Support Services operations including business systems, repair, installation, and technical support.
- Assisted with RFPs and specifications for government-funded telecommunications infrastructure overbuild and upgrades in Wilkes' serving areas.
- Managed Wilkes' ISP and IP network providing Gigabit Internet for 6,500 customers.
- Provided training and documentation to Wilkes employees on services offered, provisioning, installation, support, and repair procedures.
- Facilitated the maturation of Wilkes' Digital TV deployment including product testing and selection, programmer/contractual agreements, upgrades, training, and trouble resolution.
- Managed network elements including access nodes and customer premises equipment.
- New product testing, purchasing, integration, and deployment.

04/2006 - 01/2009: Wilkes Telecommunications: Systems Engineer

- Successfully launched and managed IPTV product for Wilkes Communications.
- Designed, implemented, and maintained active Fiber-to-the-Home network deployment for

voice, Internet, and Digital TV services throughout incumbent and competitive market areas.
- Provisioned, installed, and connected the first customers to Wilkes' active Gigabit fiber network.
- Created documentation and trained based on best practices for the installation, provisioning, and support of the Fiber-to-the-Home deployment.
- Developed and implemented migration to new ISP, which included new IP space, improved bandwidth, and provisioning tools.
- Developed network documentation and diagrams detailing Wilkes Communications' IP network and interconnection between all network elements.
- Established and facilitated training methods for support employees.

02/1996 - 04/2006: Wilkes County Schools: Information Technology Technician

- Staff development; IT systems setup and maintenance; network design, implementation, and support; software support; technology planning and purchasing.
- Designed and implemented local and wide area networks, which serve all campuses and administrative sites for Wilkes County Schools.

NOTABLES:

- Wilkes Community College - Adjunct Instructor: IT Security, Networking, CIS: 2011-2015
- Wilkes Community College/NC Department of Protective Services - Instructor: 2003-2006
- Wilkes Community College - Real World Advisory Committee
- Wilkes Community College - Curriculum Advisory Council: Engineering/Networking/CIS/CTI
- Wilkes Community College - Distinguished Alumni for Electronics Engineering
- Wilkes County Schools - Business, Industry, and Education Forum Advisory Committee
- Wilkes County Schools United Teens in Action and T3LC - Board Member/Mentor
- Wilkes Chamber of Commerce - Board Member 2017-2019 Term
- Wilkes Chamber of Commerce - Vice President of Youth Leadership
- Wilkes Circles of Care - Board Member, Vice Chair
- Wilkes County Hall of Fame - Board Member 2017-2020 Term
- NC Telecommunications Industry Association - Network Operations Chair
- NC Telecommunications Cooperative Coalition - Network Operations Chair
- NeoNova Networks - Technical Advisory Board
- AccessOn Network Operations - Member
- Visions West Digital Television Engineering Committee - Member
- North American Network Operators Group - Member

Zachary R Church

345 Lexi Dr., Millers Creek, NC 28651 | 336-928-0167 | zackchurch@myriverstreet.net

Profile

- 11+ years of experience in communications and FTTx design and deployment
- 8+ years in field designing and overseeing FTTx construction
- Trustworthy and loyal leader
- Willing and eager to think outside the box when new challenges arise
- Adaptable and flexible to change

Education

ASSOCIATE DEGREE IN ARCHITECTURE TECHNOLOGY | 2006 | WILKES COMMUNITY COLLEGE

- Dean's List 2005 & 2006
- Related coursework: AutoCAD 2006, Blueprint reading, Cost Estimating

2004 | ASHE COUNTY HIGH SCHOOL

- Early Graduate, College Prep.

Skills & Abilities

PROJECT MANAGEMENT

- Over the last twelve to eighteen months all drafting, fiber counts, drop sheets and staking sheets have been completed in-house. All construction sheets and FTTx documentation is prepared and implemented from the Wilkesboro office.
- Able to shuffle multiple projects. i.e.: Stokes County, Saluda Mtn. Barnardsville, Wilkes CLEC, Warren County
- Knack for getting the right person playing the role that best fits their expertise and needs of the company or client
- Ensures that projects are completed on schedule and within budget

COMMUNICATION

- Main point of contact for Blue Ridge Mountain Club and most major projects for OSP needs.
- Coordinates work between contractors, construction to splicing to drops through to cutover.

LEADERSHIP

- Leads by example and never shies away from a challenge.
- Takes pride in the work I do
- Collaborates with VP of Engineering to plan objectives for current and potential needs of the company

Experience

OSP ENGINEERING SUPERVISOR | WILKES COMMUNICATIONS / RIVERSTREET NETWORKS | 2016-PRESENT

- Manage 8 direct report employees. 6 Engineers and 2 CAD Operators
- Coordinates OSP work in all 8 WCI/RSN service areas
- Assists in budgeting for 10 year build plan and areas of importance
- Oversee FTTx design over entire WCI/RSN serving areas
- All drafting, fiber design , assignments and material PO's are completed in-house for all WCI & RSN properties
- Manages personal to promote growth in employees' strengths as well as weaknesses

OSP ENGINEER | WILKES TELECOMMUNICATIONS | 2010-2016

- Complied cost study for entire FTTx network
- Designed and maintained records for all inter & intra company fiber connections
- Designed and converted 6,500 acre property from a PON network to a 1 Gig capably Active network
- Built FTTx network to connect all 21 Wilkes County School
- Built FTTx to all anchor institutes within Wilkes County
- Design and oversee Fiber network to increase bandwidth to acquisitioned subscribers for temporary relief to existing facilities
- First to design and oversee construction in acquisitioned property

CAD OPERATOR | WILKES TELECOMMUNICATIONS | 2007-2010

- FTTx and cooper facility drafting
- Bi-annual CPR reporting
- FCC 477 Reporting

Gregory S. Coltrain

101 Schooner Point, Belhaven, NC 27810 | 252-964-3344 (Home) | 252-945-3058 (Mobile)

Summary of Skills:

Reliable leader with over 24 years in the communications industry providing team building skills, encouragement, training, mentoring and trust. Proficient in project planning, project management, strategizing, sales, marketing, operations, customer care, managing people, public and community relations, business development and corporate operations.

Education:

1993 Northside High School, Pinetown, NC - Diploma

1996 Beaufort County Community College, Washington, NC - A.A.S. Business Administration

Current Employment:

2018 - Present Executive Vice President of Business Development
RiverStreet Networks - TriCounty Broadband (Previously TriCounty Telecom)
Belhaven, NC

2011-Present Director of The TriCounty Foundation

2011-2018 CEO/General Manager, Executive

2006-2011 Operations Manager

2005-2006 Customer Service Manager

2001-2005 Customer Service Supervisor

1997-2001 Information Systems Coordinator

Began TriCounty in November 1997

Previous Employment:

Office Manager - Down Home Satellite Group Ltd, Internet of Beaufort County, Internet of Roanoke, Belhaven Cable TV, Hyde County Cablevision, Ocracoke Cable TV.
Dates Employed Aug 1993 – Nov 1997
Employment Duration 4 yrs 4 mos

Overseeing the call center, handling customer complaints, running billing, managing key system, building IVRs, building spreadsheets and reports, assisting with marketing plans, designing sales campaigns, building custom sales packages, troubleshooting customer equipment, support, programming equipment, network maintenance, computer support, etc.

Down Home Satellite, Internet of Beaufort, Internet of Roanoke, Belhaven Cable TV, Hyde County Cablevision, Ocracoke Cable TV

Office Manager ..... March 1997 - November 1997

Technical Consultant Supervisor ..... April 1997 - November 1997

Dealer Coordinator ..... September 1995 - November 1997

Customer Service Representative ..... Aug. 1993 - March 1997

Current Trade Affiliations:

CVTMA - Member of Board of Directors
Access On – Member of Board of Directors
American Cable Association
National Cable Television Cooperative
NTCA - The Broadband Association

Achievements:

Managed acquisition of Red's Cable TV - Late Spring 2018

Merged TriCounty Broadband into Wilkes Communications a RiverStreet Networks Company

Managed 355 Mile Fiber-to-the-Home stimulus project valued at over 16.2 Million dollars

Lead a marketing campaign to promote Fiber-to-the-Home growth and conversions after the project

Remodeled TriCounty's Corporate Office in 2011 after hurricane devastation

Developed a company wide Emergency Contingency Plan for the organization

Project Manager for an all Digital Conversion of TriCounty Telecom's RF Analog headend converting over 5000+ user's TVs to digital set-top boxes

Project coordinator for TriCounty Telecom's launch of Internet Access program

Project coordinator for integration of new IT networking facilities at TriCounty Telecom

Project coordinator for development of Wifi Broadband Access network outside TriCounty Telecom's existing Telephone Network

Seth E. Hartman

120 Low Tide Lane, Bath, NC 27808 H: 2529649302 ♦ C: 2524955008 ♦ sethhartman@myriverstreet.net

Skills

Outside Plant Engineering
Fiber Optic Cable Design
Project Inspection
Fiber Optic Cable Testing
Construction Management
Construction Expertise

Work History

OSP Engineer, 01/2018 to Current
RiverStreet Networks – Wilkesboro, NC
Detail oriented Outside Plant Engineer with 7 years of Telecommunications experience all in Outside Plant including Initial Project Staking and Design, Inventory Ordering, Tracking, and Reconciliation, Project Inspection and Management, Fiber Optic Cable Installation and Repair, Fiber Optic Cable Splicing, and Project Digitization utilizing CAD on multiple platforms. Adept at managing and motivating teams to meet critical project deadlines utilizing USDA RUS and client specifications. Extensive experience monitoring construction budgets and making adjustments to limit project spending. Team Leader with experience delivering hands on coordination of various groups including Customer Service and Operations, Client concerns and satisfaction, Project Design and Field Construction, and managing Engineering Personnel.

Resident Engineer, 04/2014 to 01/2018
Mid South Consulting Engineers, Inc. – Charlotte, NC
Responsible for all OSP Design Engineering and Construction of new Plant and existing Plant rehabilitation. Prepared project proposals, including cost estimates, schedules and project specifications. Managed multiple NC DOT projects involving the Removal and Replacement of Fiber Optic Cables, Legacy CATV, and Copper Plant in coordination with new Bridge and Box Culvert Construction. Digitized all existing OSP and new FTTH USDA RUS BIP stimulus Project into the CAD M4 Mapcom platform from Construction As-Builts. Processing and maintaining of NC DOT reports, records and ROW Encroachment applications. Management, coordination, and physical splicing of all new Fiber Optic Cable residential drops, and damages utilizing Fujikura 60S, 60R,

and 70S splicers.

Engineer, 04/2011 to 04/2014

CBW Communications Engineers, Inc. – Charlotte, NC

Manage and oversee OSP construction of multiple FTTH Projects including Skyline Membership Corporation, West Jefferson, NC and Tri-County Telephone Membership Corporation in Belhaven, NC including staking, inspection, and testing of newly constructed facilities, field and GPS surveys, as well as field survey staking, and special circuits. Prepare, process, implement, and maintain contract agreements and administration of construction forces, and complete required inspection, quality assurance testing, invoice processing and contract closeouts. Interpret OSP construction plans and specifications and convey the Clients requirements to construction contractors. Inspect the progress of OSP construction ensuring that all materials and equipment used in construction are USDA RUS compliant, acceptable, free from defects, and that the OSP is built in accordance with industry standards. Conduct necessary tests and measurements of fiber plant using Megging equipment and OTDR results ensuring compliance with the performance requirements of the Client. Develop, implement, and maintain all Engineering, drafting and facilities records, including design and closeout of facility assignments. Process and maintain records for all private and public, state and federal Rights-Of-Way and easement permits. Process and maintain environmental reports, records and applications.

Engineering Design and initial project staking of new FTTH Construction Project for AT&T in Austin, TX utilizing GPS and traditional methods.

Construction inspection managing 13 crews placing Multi-Duct Conduit via Plowing, Horizontal Directional Drilling, Hammer Drilling, and Rock-Saw methods for the MCNC North Carolina Research and Education Network from Charlotte, NC to Wilmington, NC.

Education

Bachelor of Science: Microsoft Visual Basic, NA
Queens University of Charlotte - Charlotte, NC

Bachelor of Science: Continuing Education, NA
Indiana University - Purdue University Indianapolis - Indianapolis, IN

Bachelor of Science: General Studies, NA
Indiana University Bloomington - Bloomington, IN

Certifications

Hazardous Material Certified

NC DOT Flagger Certified

Kimberley Johnson
118 S Quail Circle
Wilkesboro, NC 28697
Cell (336) 452-3255

Summary of Qualifications

- Strong accounting knowledge.
- Efficient, detail-oriented, highly organized
- Strong analytical and problem solving skills.
- Proficient in A/S 400, Microsoft Office, Excel, PowerPoint, Windows.

Experience

2015 - present *Director of Accounting & Finance* *Wilkes Communications* Wilkesboro/NC

Responsible for all areas of accounting department, regulatory reporting and warehouse. Supervise 7 employees. Plan and direct accounting functions. Produce financial reports. Maintain records for RUS, USAC and financial audits. Responsible for any accounting conversions and set up of new companies. Maintain Worker's Comp records and OSHA reporting. Serve on Safety Committee. Assist with special projects and reports as instructed by management.

2006 - 2015 *Accounting Manager* *Wilkes Telecommunications* Wilkesboro/NC

Responsible for all areas of accounting department and warehouse. Supervise 4 employees. Plan and direct accounting functions. Produce financial reports. Maintain financial records for Carolinas-Virginias Telephone Membership Association. Maintain records for RUS, USAC and financial audits. Maintain Worker's Comp records and OSHA reporting. Serve on Safety Committee. Assist with special projects and reports as instructed by management.

2004-2006 *Adjunct Faculty* *WCC* Wilkesboro/NC

Taught general accounting classes.

2002-2006 *Compensation & Benefits Specialist* *WRMC* N Wilkesboro/NC

Supervised two employees. Handled benefits for 850 employees. Balanced and paid all benefit bills. Worked with companies to negotiate affordable benefits for employees. Prepared yearly budget for Human Resources and Benefits. Handled new employee testing and screening. Verified proper licensure. Served on Staffing Effectiveness, Guest Relations and Service Excellence Committees. Maintained pension records. Worked closely with Employee Health on Worker's Comp cases. Organized United Way campaigns and benefit fairs. Trained new employees.

1998-2002 *Accounting Assistant* *WRMC* N Wilkesboro/NC

Processed and balanced payroll for 825+ employees. Balanced and filed quarterly 941 reports. Processed W-2s. Reported and balanced monthly assets. Handled bank reconciliations for 5 accounts. Trained and set-up new Kronos system. Trained managers on timekeeping system. Assisted Wellness Center with set-up of computer system and bookkeeping. Trained new accounting employees. Served as back-up for accounts payable and human resources.

Education

Gardner-Webb University, Boiling Springs, NC
Masters of Accountancy, 2005

Gardner-Webb University, Boiling Springs, NC
BS, Business Administration, 1998

Training

Telecom 101, Moss Adams
CA-VA Association of RUS Telephone Accountants Workshop, Annually
Part 32 & Part 64 Accounting, John Staurulakis
The Dynamics of Developing Leadership Skills for Success, People and Solutions, Inc.
OSHA Compliance & Safety Training, Safety-Net Inc.Sales and Use Tax, Rockhurst University Continuing Education Center
Advanced Microsoft Excel, Fred Pryor Seminars
NTCA Conference
Telergee Conference
BB&T Leadership Training
Hazmat Training

Community Involvement and Professional Affiliations

Vice President Board of Directors Carolina-Virginias Assoc of RUS Accountants 2014-2015
Business Operations Committee with NCTIA 2009-2015
CWMS Athletic Booster Secretary 2010-current
Lunch Buddy with United Way 2001-2003 and 2008-2011
Leadership Wilkes 2008
Member of Carolinas-Virginias Association of RUS Telephone Accountants, Inc., 2007-current
Girl Scout Troop Leader 2005-2006
MCES PTO Treasurer 2004-2005
Wilkes Family Resource Center Business Advisory Council 2004-2005
Loaned Executive with United Way 2003-2004

Amanda Perry

336-409-3018 | amandaperry@wilkestmc.net

Summary

Dedicated team member with over 10 years of experience combining management and customer service expertise into a position overseeing Sales & Marketing efforts. Areas of expertise include efficiency, attention to detail, effective problem solving and managing a staff with very diverse responsibilities.

Skills & Abilities

Communications and Media	Production & Processing
Project Management	Administration & Management
Telecommunications	Time Management

Experience

DIRECTOR OF SALES & MARKETING | WILKES COMMUNICATIONS | FEB 2007 TO PRESENT

During the last three years, worked with other members of the executive team to develop and deploy Wilkes Communications' competitive brand RiverStreet Networks. Effective leader of a diverse team that is responsible for inside and outside sales, customer billing, as well as marketing, branding and advertising. Successful in leading all aspects of client relations and sales lead generation for both brands. Manage customer relations and lead generation through prospecting, print, and online advertising and sponsorships. Build effective sales strategies and individual goals for direct reports responsible for both outside sales and inside sales.

- Responsible for overseeing development of all marketing presentations, collateral, displays as well as creation and maintenance of multiple brand identities and product positioning for market growth.
- Develop and implement company pricing strategies for existing and new service offerings in multiple market areas.
- Manage and direct staff in multiple retail and office locations including recruitment, coaching and team development.
- Generate and record sales records and customer service metrics for the executive team and board of directors.
- Consistently achieve high customer satisfaction rankings in the Telecommunications industry.

Work history for Wilkes Communications includes Customer Service Representative, Business Sales Representative, Customer Service and Marketing Manager and Director of Sales & Marketing.

CUSTOMER SERVICE | NBRS FINANCIAL BANK | MAY 2004 TO SEPT 2006

- Compile information about new accounts, enter account information into computers, file related forms and other documents.
- Inform customers of procedures for applying for services.
- Perform Teller duties as required.
- Investigate and correct errors upon customer request, according to customer and bank records.
- Process loan applications.
- Set up and manage filing systems, recording information and maintaining documents.
- Complete forms in accordance with company procedures.
- Review work done by others for accuracy and company formatting, and recommend revisions.

Education

2012 | WILKES COMMUNITY COLLEGE
Business Administration

2001 | PERRYVILLE HIGH SCHOOL
College Prep, Honor Society

Volunteer Experience & Leadership

2013 TO PRESENT | COOPERATIVE COUNCIL OF NORTH CAROLINA
Board of Directors, 2017 Vice Chairman

2013 TO PRESENT | COMMUNITIES IN SCHOOLS
New Century Scholarship Committee Member

2014 TO PRESENT • WILKES COUNTY COMMUNITY FOUNDATION
Board of Directors, Grants Chair

2014 TO PRESENT | UNITED WAY OF WILKES COUNTY
Board of Directors, Strategic Committee Chair, 2016 Campaign Chair, 2017 President

2015 TO 2016 | WILKES COUNTY HALL OF FAME
Board of Directors

2017 TO PRESENT • MARCH OF DIMES, WILKES COUNTY
2017 Event Chair

JODY MONROE SOUTHER

5290 Old 60, Wilkesboro, NC 28697 (336) 984-3230 ♦ Email: jsouther@wilkes.net

PROFILE

- Over 21 years' experience in telecommunications with 16 years engineering experience
- 21 years AutoCAD including current program, AutoCAD 2015
- Friendly with positive attitude; proven team leader
- Ambitious and hardworking with commitment to excellence
- Highly attentive to detail; can effectively manage multiple tasks simultaneously
- Good listener with outgoing, friendly demeanor and good sense of humor

EMPLOYMENT

2016 – Present
Wilkes Communications and RiverStreet Networks, Wilkesboro, NC
Director of Network Engineering

- Manage 5 direct report employees. 3 Engineers and 2 Cad Operators
- Responsible for the FTTX design of all outside plant throughout the entire Wilkes Communications and RiverStreet Networks serving area.
- Oversee cutover of all FTTX Customers in all serving areas
- Maintain all CPR records that correspond to Outside Plant
- Create yearly budgets for the entire outside plant in all serving areas of Wilkes Communications and RiverStreet Networks.
- Manage multiple build projects from design to final construction and implementation on the network.
- Negotiate pricing of all outside plant products with vendors and manufacturers.

2008 - 2016
Engineering Supervisor

- Manage 5 direct report employees. 3 Engineers, 1 Cad Operator and 1 Cutover Coordinator.
- Oversee all outside plant engineering. This includes new construction and plant removals.
- Oversee cutover of all Fiber To The Home Customers.
- Maintain all CPR records that correspond to Outside Plant.

1999 - 2008
Engineer

- Engineer new cable jobs by staking new jobs, obtaining right of way from public
- Facilitate jobs with the NC Department of Transportation and inspect new construction
- Apprenticed with Construction Department to gain understanding of building aerial and buried cable lines

1994 - 1999
CAD Operator

- Used AutoCAD to draw and design outside plant and facilities
- Maintain all outside plant drawings for ILEC serving area.

EDUCATION

2005
Gardner Webb College, Boiling Springs, NC
Bachelor's Degree in Business Administration

2003
Wilkes Community College, Wilkesboro, NC
Associate Degree in Architecture Technology

1994
Wilkes Community College, Wilkesboro, NC
Associate Degree in Electromechanical Technology

1992
Wilkes Community College, Wilkesboro, NC
Diploma in Architectural Drafting

TRAINING AND SEMINARS

2015
OSP Expo
Denver, Colorado

2015
Tri-State Conference
Charleston, South Carolina

2014	FTTH Council Raleigh, North Carolina
2014	Outside Plant Expo Baltimore, Maryland
2014	StellarRad Systems User's Meeting St. Louis, Missouri
2014	Tri-State Conference Cherokee, NC
2013	Fiber To The Home Conference and Expo Tampa, Florida
2013	Tri-State Conference Chantilly, Virginia
2012	StellarRad Systems User's Meeting St. Louis, Missouri
2012	Tri-State Conference Charleston, South Carolina
2011	Tri-State Conference Charlotte, North Carolina
2010	Fiber To The Home Conference and Expo Las Vegas, Nevada
2010	ACE Conference, Association of Communication Engineers St. Louis, Missouri
2010	Tri-State Conference Norfolk, Virginia
2010	NCTIA Technology Conference Winston-Salem, North Carolina
2009	Fiber To The Home Conference and Expo Houston, Texas
2009, 2008	StellarRad Systems User's Meeting St. Louis, Missouri
2008	OSP Expo Baltimore, Maryland
2008	ACE Conference, Association of Communication Engineers Memphis, Tennessee

AWARDS

- 2000 – Inducted into the Architectural Hall of Fame at Wilkes Community College
- 1992 – Who's Who in Community Colleges