

Broadband Infrastructure Inventory Study for Jefferson County, NY

June 15, 2021



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The information in this report was gathered for the exclusive use of Jefferson County and the Development Authority of the North Country for the purposes of analysis and planning.

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1. Introduction

Broadband access has become one of the foundational resources that allows a community to compete and thrive in the 21st century. Infused into all aspects of our social and economic life, broadband connects computers, cell phones, television, and most modern communications.

Broadband powers emails, Internet searches, social media, online shopping, and information management. It enables business, education, medicine, government, and public safety to perform their functions efficiently. It is a critical component of economic development and a community's ability to attract and retain industry. Recent surveys show high-speed broadband is now as important to job creation and business locations as good transportation and skilled labor.

Telecommunications infrastructure and broadband service have transformed the way people, public organizations, and companies communicate, educate, work, and live. Broadband, and the fiber optic backbones that support it, have undeniably become the "interstate highway" of the 21st century.

The use of broadband service is becoming ubiquitous. By 2023, North America will have 345 million Internet users (92 percent of regional population), up from 328 million (90 percent of regional population) in 2018.¹

Broadband is today considered infrastructure as critical as roads, electricity, and water. Inadequate broadband has become a barrier to community growth, competitiveness, and economic development. This has led to something called "The Digital Divide." DANC in partnership with Jefferson County has commissioned this study in part to understand its rural area broadband capacity, as well as explore opportunities for possible broadband expansion to help the County overcome this Digital Divide.

1.1 The Digital Divide

On Feb 8th, 1996, the Federal Communications Commission (FCC) created the Telecommunications Act to establish competition and facilitate growth in the telecommunications industry, which previously had been a government-regulated monopoly.

After the Telecommunications Act, telephone companies called Competitive Local Exchange Carriers ("CLECs") emerged and were able to provide consumers with a choice of services. During this period other non-traditional telecommunications companies such as cable TV providers, network providers, and

wireless providers (both cellular and fixed wireless) began to offer competitive broadband services to participate in the explosive growth of the Internet.

Over twenty-five years have passed since the 1996 Telecommunications Act, which succeeded in creating competition and increased availability of broadband access. Despite that success, a technology gap has occurred between communities that have access to affordable broadband service and those that do not. This division, known as the Digital Divide, has split communities into broadband “haves” and “have nots.”

Much of the rural area is less densely populated, with lower income households and poor accessibility to broadband. Local counties and cities want to develop future potential but unfortunately do not show a return on investment for broadband providers.

In many instances, the difference between areas that have access to broadband service and those that do not can be less than a mile, but the cost to overcome this short distance can be more than a resident or business can afford.

Despite the increased need for broadband service, rural areas of the country still rely largely on copper-based infrastructure such as the incumbent telephone companies’ unshielded twisted pair copper wire or satellite connections for broadband connectivity.

Unfortunately upgrading copper’s limited bandwidth to the high bandwidth capacity of fiber has not been an area of focus for the telecommunications industry. This is due mainly to the high cost of installing fiber and the low population densities of rural areas that create lengthy return on investment models. Furthermore, the incumbent broadband providers are reluctant to invest in expensive telecommunications infrastructure upgrades, which do not show profitability.

Much of the infrastructure in place today in these areas has been in operation for more than 50 years. Most of the telecommunication’s industry is focusing elsewhere, with investment dollars being spent in high growth areas such as tier 1 and tier 2 cities, where fiber cable is densely installed. Comparable to the lack of electricity in rural areas of this country before the National Rural Electrification Act of 1936, many areas in New York State are being rapidly left behind.

1.2 Efforts to Close the Digital Divide

There are federally subsidized programs to expand local incumbent provider broadband such as the Connect America Fund (also known as CAF), Rural Digital Opportunities Fund (RDOF) and the USDA ReConnect program. However, as broadband is not a publicly regulated service, like telephone service, there are no obligations for the provider to make new broadband investments in unprofitable areas.

Two of the initiatives driving broadband expansion into the rural communities of New York State include the 2016 Charter Communications/Time Warner Cable merger and the “New NY Broadband (grant) Program”.

As part of the approval of the Charter Communications/Time Warner Cable merger, New York State required the newly merged company, now known as Spectrum, to expand services to 145,000 households statewide by 2020. Ultimately, delays in Spectrum construction resulted in a revised schedule requiring the network expansion to be completed by September 30, 2021. ²

This requirement, intended to help expand the availability of broadband service, will reach many homes but not all.

Over the past few years and coincident with the Charter/Time Warner merger, New York State has offered three rounds of grant funding to support the deployment of broadband to unserved and underserved residences and businesses of New York State.

To date, over \$17.4M have been invested in broadband expansion in Jefferson County through the New NY Broadband Program. Since 2015, six broadband providers have been awarded grants in Jefferson County. This list includes Castle Cable, Citizens of Hammond, Frontier Communications, Hughes Network Systems, TDS Telecom and Verizon. The respective investment and grant awards for the county are listed below in Table 1.³

TABLE 1: NEW NY BROADBAND GRANT AWARDS IN JEFFERSON COUNTY

Awardee	State Grant	Total Investment	Locations	Pct of Locations	Pct of Investment
Castle Cable TV Inc.	\$ 632,558	\$ 790,699	129	2.8	4.54
Citizens of Hammond	\$ 58,458	\$ 73,072	16	0.35	0.42
Frontier Communications	\$ 109,603	\$ 176,541	35	0.76	1.02
HughesNet Systems, LLC	\$ 551,100	\$ 986,475	2884	62.53	5.67
TDS Telecom	\$ 3,030,492	\$ 4,040,655	458	9.93	23.22
Verizon	\$ 6,449,861	\$ 11,333,358	1090	23.63	65.13
Total	\$ 10,832,072	\$ 17,400,800	4612	100	100

A graphical representation of the census blocks awarded grant funding by the New NY Broadband Grant program is shown in Figure 1. The census blocks awarded also represent the blocks to which Spectrum did not commit to expand its service as part of the merger agreement approved by New York State.

Of the 4,612 locations in Jefferson County covered by the New NY Broadband Grant, 62.5% of the locations are being addressed via satellite service. Unfortunately, satellite service can be impacted by weather and has high latency, which can be detrimental to voice, TV, gaming, and video applications. Also, satellite service is relatively expensive with capped data usage. Once the cap is surpassed for the month, speeds are throttled down.

Today, communities increasingly compete to become a “Gigabit Community,” which is the new Gold Standard for areas that want to attract the people, jobs, businesses, and investments of the future.

Community involvement toward this goal enables the development of mutually beneficial partnerships involving organizations such as counties, cities, electric companies, alternative broadband providers, and more, enabling new investments in broadband infrastructure.

These organizations can make long-term investments to improve their communities, and the Digital Divide is being bridged by communities that are willing to plan and cooperate to reach their growing broadband needs.

According to NYS, the entire County is now served by sufficient broadband. The federal government, however, does not recognize current generation satellite service as true broadband. After reviewing the FCC 477 data, the County is very well served. However, there are areas in each township of the county that do not have at least 25Mbps/3Mbps broadband available. With that said, the FCC is awarding next generation satellite service to satellite companies through its RDOF Grant program.

As documented in this Inventory of Broadband Infrastructure report, Jefferson County is underserved in many rural areas in which a grant has been awarded to satellite providers. A map of the County's broadband supporting infrastructure illustrating this statement is contained later in this report.

In 2020 and 2021, the world moved into lockdown to protect against the spread of the COVID-19 virus. This caused a major shift in the way we perform critical tasks including work from home (video conferencing and collaboration, virtual private network access to company systems), learning from home (video conferencing and collaboration and access to e-learning platforms), telemedicine (video conference with healthcare professionals and access to healthcare systems).

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JEFFERSON COUNTY, NY - NYS Broadband Grant Award Areas by Company

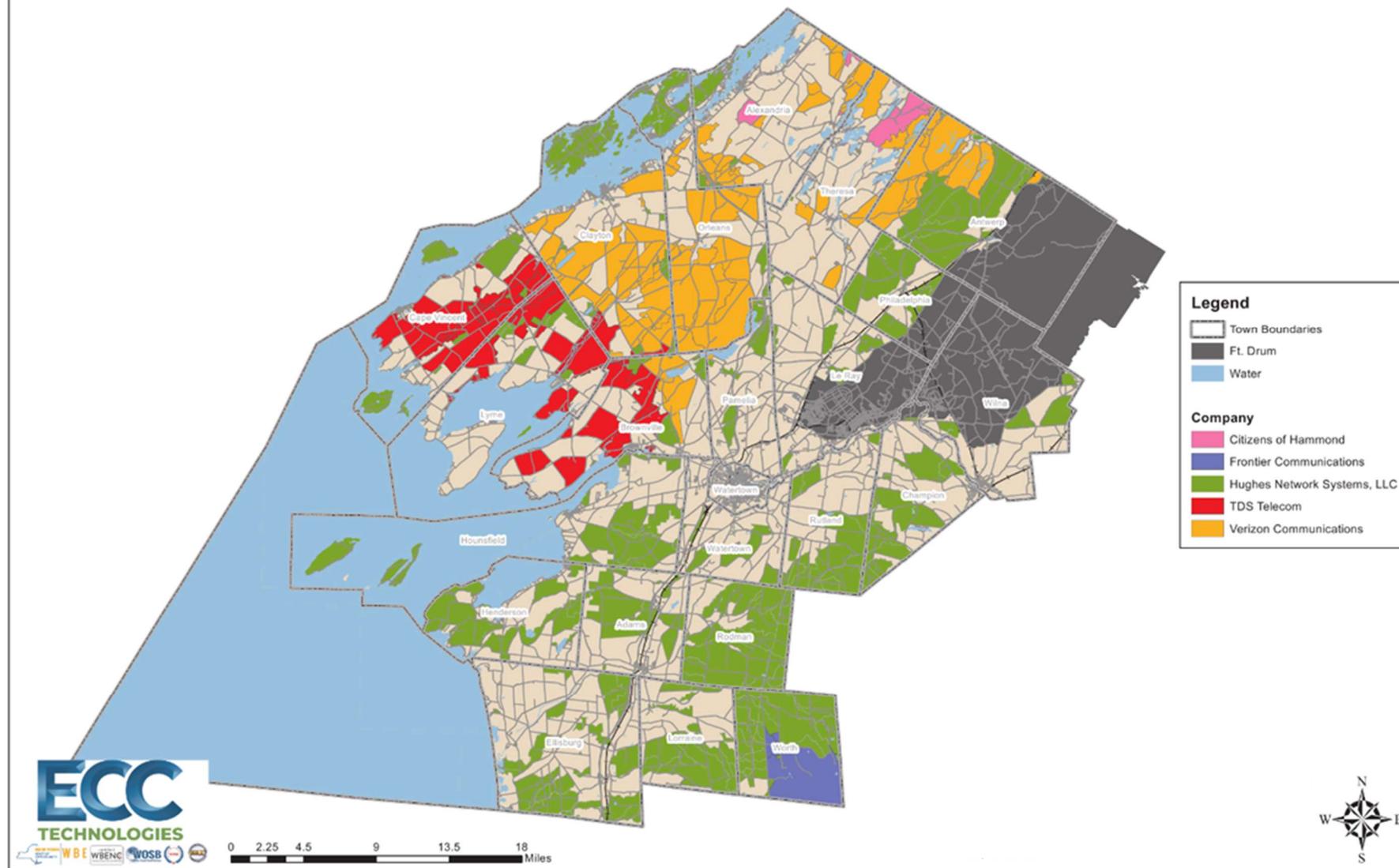


FIGURE 1: JEFFERSON COUNTY - NEW NY BROADBAND GRANT FUNDING AREAS ROUNDS 1,2 &3⁴

Covid also had personal impacts including shopping (ordering food and items for delivery or curbside pickup) and entertainment (video streaming, online gaming, social media). Fixed broadband traffic increased up to 60%, voice traffic increased up to 130% and Wi-Fi calling increased up to 80%.⁵

People in the County have been enduring social distancing and self-isolation due to the pandemic. The situation has brought to light the importance of remote healthcare, learning, and working from home. The COVID-19 pandemic has exposed the nation's persistent broadband issues including availability, affordability, and speed of service exponentially.

As many people are quarantined in their homes, lack of access in rural areas is getting unprecedented attention with newly announced grant programs from both federal and state agencies. In 2015, the FCC set the standard for broadband access at 25Mb/s download by 3Mb/s upload.

A new standard of 100Mbps download is being discussed among industry analysts. Four US Senators called upon the Biden Administration to establish a "21st century definition of high-speed broadband" of 100Mb/s both download and upload. The FCC is likewise supporting a new standard above the current one.⁶

Overall, Jefferson County is quite well served. However, broadband service is lacking in some areas of the County. The largest areas lacking in service can be found in the southeastern reaches of the County. Also, as shown in the study's mapping information, pockets of areas across the County would benefit from additional service and competition. Information in this report can be used to help Jefferson County lessen the Digital Divide.

Figures 2 and 3 represent the FCC 477 data set that identifies those census blocks reporting at least 10 Mb/s download and 1Mb/s upload speeds (light green areas) and areas with at least 25Mb/s download by 3Mb/s upload speeds (dark green).

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JEFFERSON COUNTY, NY - FCC477 - AT LEAST 10MBPS DOWN/1MBPS UP

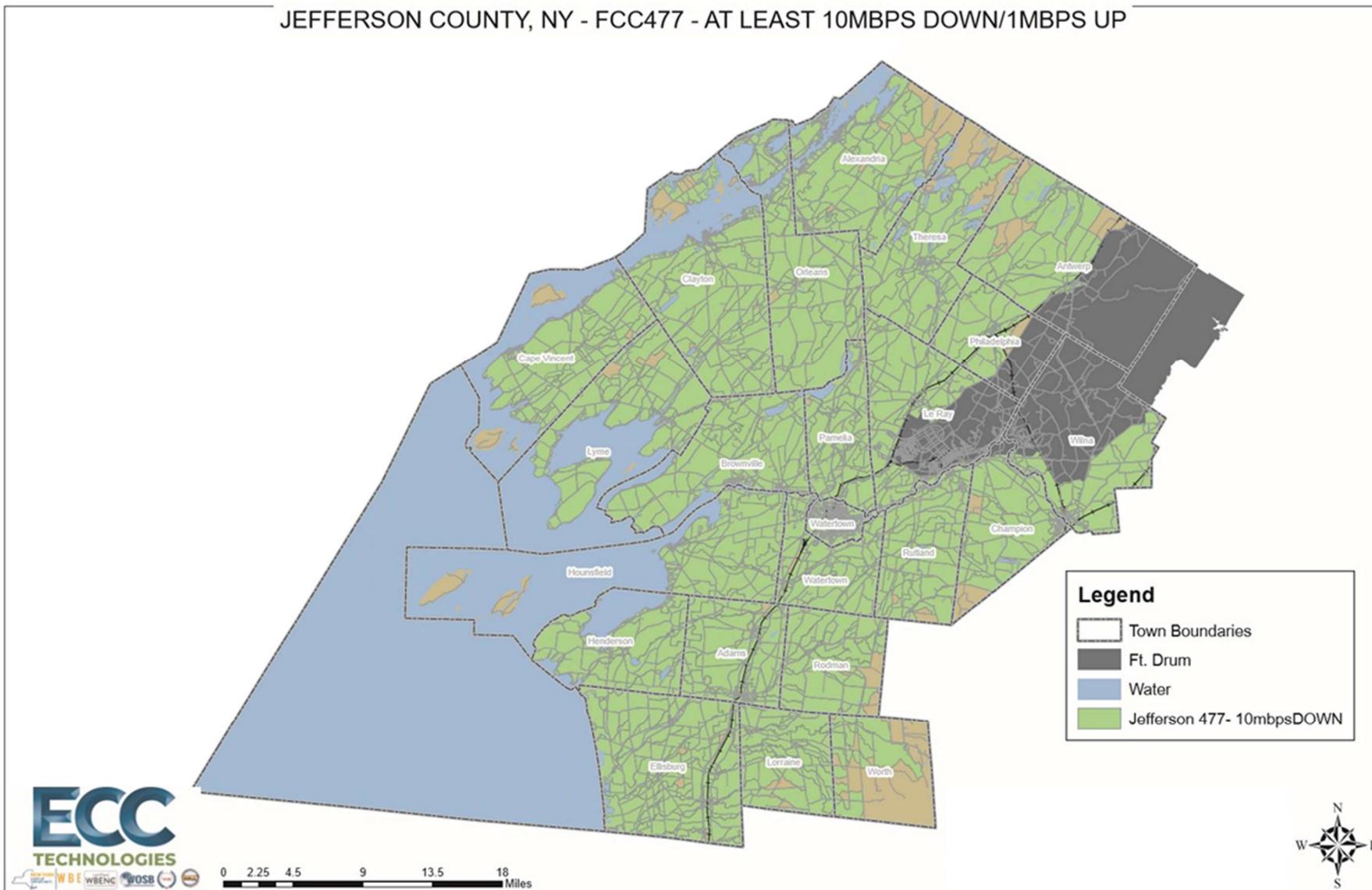


FIGURE 2: FCC 477 CENSUS BLOCKS REPORTING AT LEAST 10MBPS/1MBPS⁷

JEFFERSON COUNTY, NY - FCC477 - AT LEAST 25MBPS DOWN/3MBPS UP

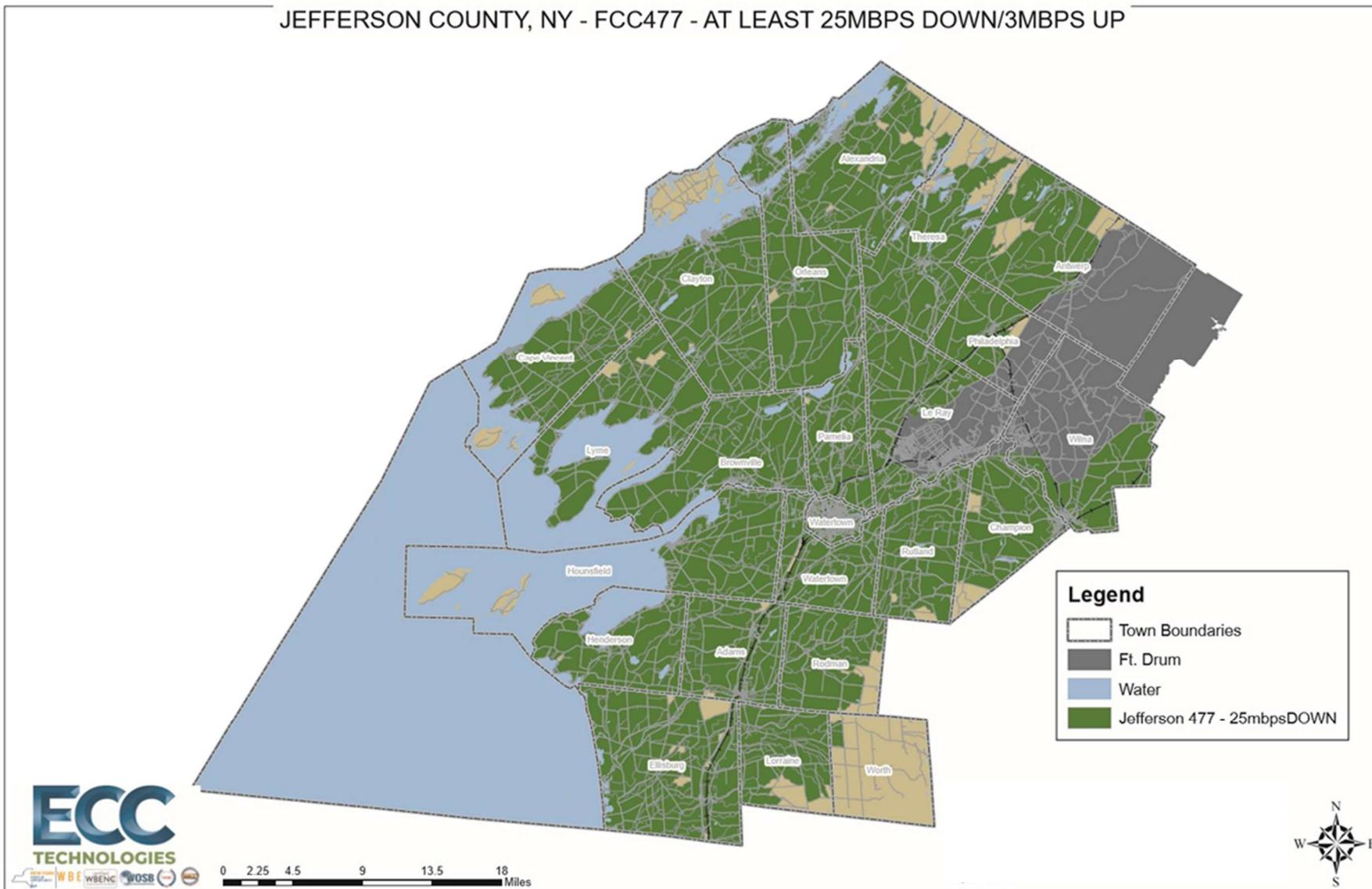


FIGURE 3: FCC 477 CENSUS BLOCKS REPORTING AT LEAST 25MBPS/3MBPS.⁸

The cross referencing of field study data with the results of a Broadband Availability & Adoption Tool (BAAT) campaign will further help define areas of need in a more granular manner and provide a basis from which to obtain partners and funding. This will be discussed in the summary BAAT campaign information at the project closeout.

Regional Digital Opportunity Fund (RDOF).

Early last year, the FCC RDOF program replaced the Connect America Fund better known as CAF. This new \$20.4B grant program is based on two separate reverse or “lowest bid wins” auctions. The first auction was held in October of 2020 and targeted census blocks that are wholly unserved with fixed broadband at speeds of at least 25/3 Mbps.

RDOF Awarded areas are shown on the next page in Figure 4. The three award winners in Jefferson County were Citizens Vermont Acquisition Corporation (the holding company for Citizens Telephone of Hammond), Frontier, and Space Exploration Technologies Corporation, or as it is better known, SpaceX. The second auction date has not been set.

The yellow areas in Figure 4 represent the Citizens Telephone of Hammond. The blue areas represent the Frontier awarded census blocks. Both Citizens and Frontier will be installing fiber to the home to provide a gigabit solution. In 2020, Frontier filed for bankruptcy. The company’s restructuring plan to cut more than \$10 billion of debt was approved by a bankruptcy court in August 2020 and Frontier aims to exit Chapter 11 by the first quarter of 2021.⁹

The red areas represent census blocks awarded to SpaceX. SpaceX will be launching and utilizing next generation low earth orbit satellites to provide at least 25/3 Mbps service. This new service is known as Starlink and is currently in beta testing.

The Starlink website states speeds will be between 50Mb/s and 150Mb/s. However, a clear line of site between the Starlink dish and the satellite will need to be available. Unlike terrestrial fixed wireless services, weather can impact the performance of the connection.¹⁰

The award amount is paid out to the winning bidder as yearly installments over a 10-year period. Under the RDOF rules the service provider winning the award has 3 years to complete 40 percent of their build and 6 years to complete the full build out. Citizens has committed to bring 233 homes Gigabit service. Frontier has committed to Gigabit service to 290 homes. Finally, SpaceX will be providing their service as described above to 599 homes as part of the program.

There is concern, because the program allowed competitors to continuously underbid each other, to maintain or gain market share. Many areas saw a “race to the bottom” that will potentially produce unsustainable business models.

Many fear that some of the companies that will take the money will not be able to construct the system they have committed to build. In January of this year, a letter signed by 160 Senators and House Representatives urged the FCC to be fastidious with its review and confirm that the winners can deliver on their respective system build out commitments.¹¹

JEFFERSON COUNTY, NY - RDOF

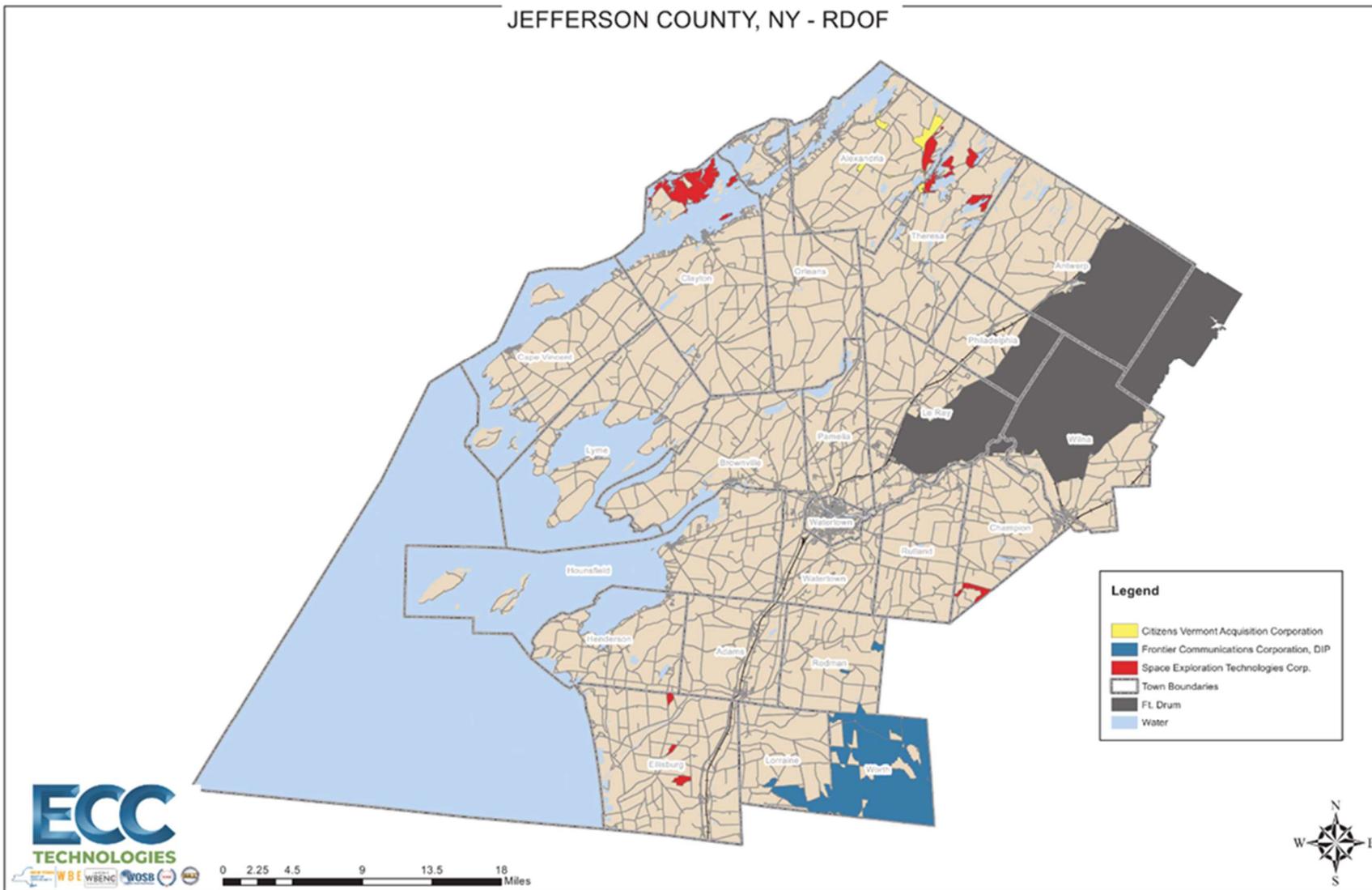


FIGURE 4: FCC RDOF AWARDED CENSUS BLOCKS

1.3 Areas of Potential Eligibility for USDA ReConnect Grant

ECC reviewed the rules of Round 1 and 2 of the USDA ReConnect grant program. Based on this review, the NY State Broadband grant awarded to HughesNet satellite were eligible for funding. However, the USDA, in its analysis of satellite services, does not view current generation satellite service as a viable broadband service due to usage caps and latency issues inherent with the service.

“Sufficient access to broadband means any rural area in which households have fixed, terrestrial broadband service delivering at least 10 Mbps downstream and 1 Mbps upstream,” was the definition applied by the USDA ReConnect Funding Opportunity Announcement. “Mobile and satellite services will not be considered in making the determination of sufficient access to broadband.”¹²

Therefore, if future ReConnect Grant rounds are consistent with the first two rounds, areas in Jefferson County that were awarded to HughesNet by New York State could be eligible for grant consideration. Like the Federal Governments’ Rural Utility Service (RUS) based USDA ReConnect grant program, the FCC RDOF grant program also did not consider census blocks served by current satellite service as being served.

The Federal RUS programs consider satellite-based broadband as a potential solution “...if the proposed project is proposing to fund terrestrial-based facilities for satellite broadband services, the plans offered to subscribers may not cap bandwidth usage. Furthermore, RUS must determine that the service plans offered to subscribers within the service area are reasonable.”¹³

RDOF grant awards were made to SpaceX through their Starlink satellite broadband service in small areas of Jefferson County. It is expected these areas will no longer be eligible for Federal grant dollars. There are few if any rural areas of the County that may qualify for the federal ReConnect grant program if the requirements of the program remain the same in future rounds.

The map below, Figure 5, represents the RDOF award areas overlaid on the NYS Broadband grant award areas. The sections colored green representing the HughesNet awarded areas are the first areas to investigate to explore for potential funding opportunities.

All areas that were considered served before the grants (sand color) and all areas that have new Fiber to the Home (FTTH) services (Frontier and Verizon) are not eligible for ReConnect grants. Also, the census blocks where RDOF grants were awarded to SpaceX counts as served by the USDA ReConnect program.

JEFFERSON COUNTY, NY - RDOF over NYS Broadband

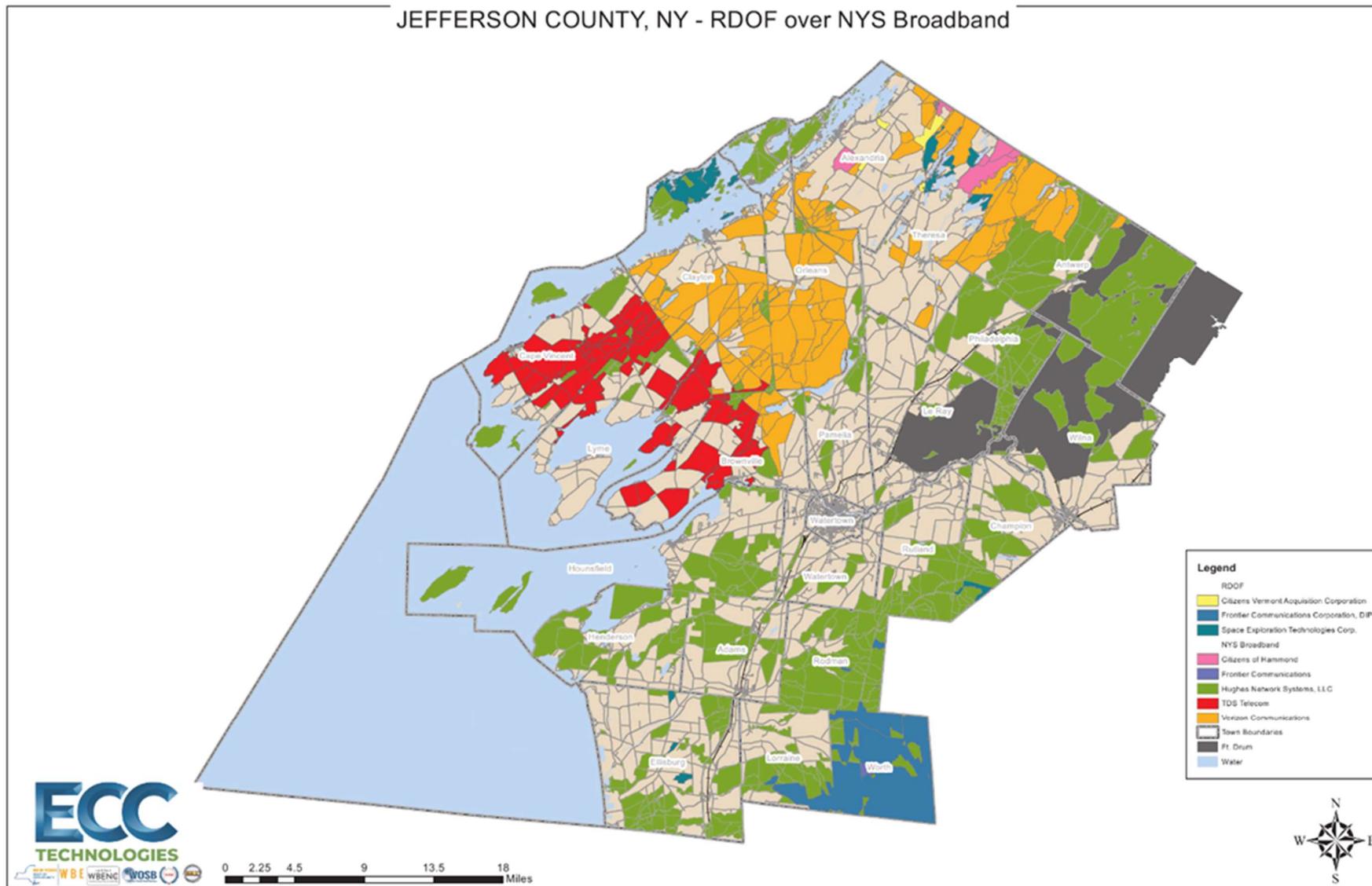


FIGURE 5: FCC RDOF AWARD AREAS OVERLAID ON NYS BROADBAND GRANT AWARD AREAS

2. Commission of the Study

In November of 2020, the Development Authority of the North Country (DANC) contracted with ECC Technologies, Inc. (ECC) to perform a telecommunications study by conducting an inventory of existing fiber optic, coaxial assets and other broadband supporting infrastructure within Jefferson County, NY.

The purpose of the study is to accurately identify areas of the County that are lacking in broadband infrastructure. In addition, the data collected from this effort will be able to be used in the next steps to develop a technological solution to address the lack of broadband in unserved and underserved areas of the County, and to obtain partners and funding to address these issues.

The inventory project included a field inventory of the County's existing broadband infrastructure, namely the fiber optic, coaxial cable, and tower infrastructure. ECC's OSP team drove the roads in the County and to the extent possible, physically identified and documented the County's existing broadband infrastructure.

As per the agreed upon scope of work, ECC did not drive the cities or villages in the County including Watertown, as our focus was on the rural areas of the County. The ECC team obtained County maps from the County's Planning Department, and along with the field data gathered, created maps of the County's infrastructure into an ESRI GIS database.

Fort Drum is a United States Army military reservation in Jefferson County, NY. Fort Drum occupies 107,265 acres and is located to the northeast of Watertown. The facility supports active and reserve units from all services, training 80,000 troops annually. The facility has an estimated population in 2021 of 13,020.¹⁴ However, the last census count in 2010 stated a population of 12,955 at Fort Drum.¹⁵ The team did not enter the US Army Base at Fort Drum due to security restrictions.

This general infrastructure report documents our findings. The County will be described in terms of existing fiber, coaxial and tower infrastructure, and potential fiber and wireless based broadband access. ECC has identified the different broadband providers in the area and describes their current levels of fiber infrastructure. ECC has created maps documenting, to the extent possible, fiber and tower infrastructure.

These maps consist of the following information, and will serve as the foundation to overlay future County Initiatives:

- Fiber optic cabling
- Coaxial cabling
- Central Office and remote terminals
- Wireline boundaries
- Wireless tower and water tower sites

At the end of this task, the inventory and accompanying maps created will not only show where fiber-based broadband exists today but give insight into areas that need additional infrastructure for the expansion of broadband services. Critical broadband access/telecommunications infrastructure information will be disclosed that will lay the foundation for broadband improvement plans.

The information compiled by ECC Technologies is presented in the following pages of this report. Much of this information has also been placed into an interactive electronic geographic information system (GIS)

database and provided to DANC. This database tool consists of interactive mapping elements that can be used to identify and locate the major telecommunications resources within the area for economic development and County planning purposes.

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2.1 Research Methodology

To gather the information required for the study, ECC researched the major telecommunications providers listed below and performed field surveys, whereby an ECC engineer travelled the rural (outside of villages, hamlets and cities) roads in the County to identify and document outside plant (OSP) infrastructure. The following were identified:

1. Wireline Providers
 - a. Incumbent Local Exchange Carriers (ILECs)
 - b. CATV Cable TV/Modem Service Providers
 - c. Competitive Local Exchange Carriers (CLECs)
 - d. Network Services and Dark Fiber Providers
2. Communications Towers

Secondary research utilized publicly available databases managed by federal and state agencies and information purchased from telecom industry database research organizations to complete the inventory. Primary research was conducted by outside plant personnel field surveys for fiber optic and coax route identification via aerial and underground markers, networking equipment and tower locations.

The towers in the County were visited and digitally documented. ECC also obtained telecommunications industry data publicly available from the following Federal, State, and local organizations: the FCC, PSC, and Jefferson County. Other resources included certain databases to which ECC has access, telecommunications industry research companies, telecommunications provider websites, and telecommunications industry professionals.

ILEC's are no longer marking their buried fiber cables as "Buried Fiber Cable." All new installations are simply being marked as "Caution: Buried Cable." This is being done to avoid giving competitors the locations where the ILECs are expanding/deploying new fiber services.

2.2 GIS Mapping/Database

All infrastructure information discovered in the inventory phase has been integrated into a GIS model developed for and provided to DANC. This GIS database will be administered, stored, and updated by DANC staff to ensure security and continuity of the resource.

The GIS database of information was developed to support broadband and economic development initiatives. This information will be used by DANC and the Jefferson County Planning Department for

County and local level use. The maps included in this report represent the area's fiber optic cable, coaxial cable and vertical asset infrastructure documented in this study.

3. Broadband Infrastructure Overview

This section is an introduction to the major providers and different types of infrastructure used in the County to deliver broadband service. A summary map that shows the available and important infrastructure is also included.

The broadband providers in Jefferson County are delivering service to homes, businesses, and other organizations at varying degrees of access, performance, and cost. The infrastructure in use by the industry include landlines consisting of copper, coaxial, fiber optic, or wireless based technology utilizing strategically placed towers and satellite.

3.1 Wireline Infrastructure – Copper, Coaxial, and Fiber Optic

Wire line infrastructure includes telephone and cable TV cables, which are either buried in the ground or attached aurally to utility poles. Wire line cables can be twisted pairs of copper wire, coaxial, or fiber optic cable.

The wireline infrastructure for the County is primarily owned and operated by incumbent local exchange carriers Citizens of Hammond, Frontier, TDS Telecom and Verizon and cable providers Spectrum Communications and Castle Cable TV. Westelcom, a local CLEC is also a fiber-based provider per the FCC 477 report.

Digital Line Subscriber (DSL) Service.

Traditional telephone copper cable is still the most used infrastructure serving homes and businesses across the County. Copper cable is used by the telephone companies to connect Central Offices to end users for the purpose of providing traditional voice and data services, typically referred to as broadband.

Copper cable has a very limited capacity for broadband service and is usually the reason why advanced telecommunications services are not available in certain areas. Copper based DSL service speed is limited by the distance from the home to the Central Office or Remote Terminal, the condition and diameter of the copper wire, and the restrictive performance qualities inherent to the wire itself.

Most of the residential telephone service in Jefferson County is supplied by copper cable that consists of numerous pairs of unconditioned twisted pair (UTP) copper wires. To provide a faster service over existing copper lines, the telephone carriers have developed digital services called DSL, or “digital subscriber line” technology, which is considered by some a low-end form of broadband.

ADSL uses an ordinary UTP line to deliver bandwidth services of up to 25Mbps service (and sometimes more), depending on the type of ADSL and the distance from the point of equipment. Since its introduction into the telecommunications industry, ADSL has become a very popular service for the incumbents because it requires only the addition of new end equipment and not the replacement of cable, which is very expensive.

Another type of DSL being deployed is VDSL2 which can provide a sum of downstream and upstream speeds of up to 200Mbps. A drawback of the technology, however, is that it requires that customers be

within three cable miles of the DSL equipment, and even that is no guarantee of service for several reasons.

CATV/Coaxial Cable

The cable TV (CATV) providers (Spectrum and Castle TV) utilize Data Over Cable Service Interface Specification (DOCSIS) over a hybrid fiber optic/coaxial cable network to provide high quality video, high speed data, and voice services to their customers.

In most cases the fiber provides a connection from the signal origination, referred to as the headend, to a node which converts optical signals to electric. From the node, the signal is sent to the customer site via coaxial cable. The high-performance characteristic of coaxial cable supports the transmission of telephone, video, and data.

The CATV provider utilizes cable modem technology, which uses a single coaxial cable TV connection to a customer location to support the simultaneous transmission of voice, TV programming, and Internet. In Jefferson County broadband access is available in central populated areas via this hybrid fiber/coaxial infrastructure installed by the incumbent cable TV provider.

Dark Fiber

Dark fiber is the term used in the industry to describe fiber optic strands (in the cable) that are leased or sold to the customer or end user without services delivered over them. Unlike fiber from a service provider, the end user must light and operate the fiber strands with their own electronics.

This type of fiber is typically used to connect multiple locations together over an end user's private network. The advantage of dark fiber is that the end user has control over the type of technology and network used, however the end user is also responsible for operation and maintenance of the infrastructure.

3.2 Central Offices (CO's)

The Central Office is a building, typically made of brick or concrete block, which the incumbent telephone company uses to place and operate voice, data, and video switching equipment. The equipment used in the local Central Office determines the level and availability of services within a certain area or "wire boundary" which is the extent to which the wires leaving the CO can reach.

Citizens Telephone Company of Hammond, NY has one CO in Hammond, Frontier has five, TDS has three and Verizon has 11 central offices serving the County. The Citizens sole CO, one Frontier and two Verizon COs are located outside of the County but provide service to the southern and eastern border areas.

3.3 Utility Poles

Utility poles and telephone poles are generally owned by one of the following organizations: the local power companies, the incumbent telephone companies, or the municipal entities including villages and cities. Utility poles are used to carry electric power lines and telecommunications cables. The electrical power lines are generally located at the top of the pole and the telecommunication lines are attached on the sides.

To be compliant with the National Electric Code (NEC), there must be 40” separation between a telecommunication line and a power line on the pole. The area on the pole where the telecommunication cable resides is known as the communications space or “comm space.” Usually, aerially mounted fiber cable is tagged with an orange, blue, or yellow label so it is easily identified for maintenance or repair.

All poles have a limited number of telecommunications lines they can carry. These lines are attached to the pole, one on top of the other. Therefore, a taller pole can accept more lines than a shorter one. Once lines are installed on a pole, adding a new line can require moving existing lines to make space for the new one.

In the construction process of adding a new cable, moving the existing lines, or replacing a pole to make room for another is called “Make Ready” work.

Most poles in Jefferson County are owned by National Grid, a utility company, and telephone companies Frontier, TDS Telecom and Verizon. There are also municipal power organizations in the Village of Philadelphia and Village of Theresa.

3.4 Water and Wireless Tower Structures.

Wireless technologies are the fastest growing segment of the telecommunications industry. Wireless infrastructure supports cell phones, pagers, personal digital assistants (PDAs), mobile data terminals, messaging, and Internet services. Wireless antennas or access points are located on wireless towers, tall buildings, and even water towers throughout the County. In some instances, the wireless infrastructure installed can offer connectivity in areas where landline infrastructure cannot.

Wireless bandwidth technologies are developing at a rapid pace. Hybrid solutions that are using fiber as the backhaul and wireless as the “last mile” are being tested and installed across the country. Using fiber cable to get close to the customer, new and emerging wireless technologies are bridging the gap by providing high bandwidth service over the last mile costly link to the customer home.

These new hybrid systems can provide speeds of 50Mbps and more. Cellular companies and wireless Internet service providers (WISPs) are beefing up their networks in preparation for new wireless technologies that will allow them to connect to customers in rural environments.

The key to wireless providers accessing rural areas is the availability of fiber infrastructure and vertical assets where the provider can place their antennas. Even the incumbent telephone companies are beginning to take notice. AT&T is now using wireless technologies to bring high bandwidth to homes in rural areas.¹⁶

AT&T’S Fixed Wireless Internet promises to bring speeds greater than 10Mbps down and 1Mbps up. However, based on the current FCC definition of broadband access, which is 25Mbps downstream and 3Mbps upstream, this would not be considered ideal.

5G Mobile / Cellular Technology

Fifth generation cellular technology (5G) promises high speed data rates (promising over 100Mbps in very short distances) that are supported by many antennas covering a given area. On October 27, 2020, the FCC established the 5G Fund for Rural America which will make up to \$9 billion available to bring 5G mobile broadband service to rural areas.

The federal government plans to auction off \$9 billion in 2 phases in the coming years.¹⁷ Since 5G is dependent on many vertical assets to mount antennas on, it will be interesting to see the types of solutions the cellular companies will have for rural areas.

Many of the wireless towers in Jefferson County have cellular equipment installed on them to provide cell phone-based coverage. The service coverage of a typical cellular equipped tower can be anywhere between one and ten miles depending on the equipment in use, how the equipment is set up, terrain, and the height of the towers.

Cellular service is limited in bandwidth and is charged on a “data cap” rate, limiting the Mbps used per month, which equates to very expensive data plans for Internet usage. Because of these two factors, it is generally not considered a viable small business and home form of Internet access at this time.

There are 90 wireless tower structures and 24 water towers identified either through field inspection, GIS database research, registered with the FCC data base or through data provided by the County. Of all the tower sites identified, there are 62 wireless towers registered on the FCC website.

Many of the towers are located alongside major roadways and population centers, with the highest concentration of towers installed in and around Watertown and then evenly dispersed throughout the County.

The height of all FCC registered towers ranges from 21 to 181 meters with the majority being in the 50-to-100-meter range. Owners of the registered wireless towers in the County are shown in Table 2.

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TABLE 2: VERTICAL ASSETS REGISTERED WITH THE FCC IN JEFFERSON COUNTY

FCC Registered Towers in Jefferson County, NY	
Owner Name	Towers
American Towers LLC	5
CAPE AL BROADCASTING INC DBA = WKGG FM	1
CASTLE CABLE TELEVISION	1
CCATT LLC	2
M. Celenza Communications	1
Community Broadcasters, LLC	1
Crown Atlantic Company LLC	2
CSX Transportation	1
Evolution Site Services, LLC	2
Global Tower, LLC. through American Towers, LLC	2
Gray Media Group, Inc.	2
Jefferson County Government	6
MARS HILL BROADCASTING CO INC DBA = MARS HILL NETWORK	1
National Grid USA Service Company, INC.	2
Nexstar Inc.	1
PI Tower Development, LLC c/o Lendlease Americas, Inc	1
Relyea, John	1
SBA Properties, LLC	5
Spectrasite Communications, LLC. through American Towers, LLC.	3
St. Lawrence Seaway RSA Cellular Partnership	15
Stephens Media Group - Watertown, LLC	5
Towers Unlimited LLC	1
Village of Sackets Harbor	1

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Based on the FCC information, the County registered six towers in the following areas: one in Glen Park, Mannsville, Theresa, and Watertown (HWY dept) and two in Champion. According to County staff, the County recently finished an upgrade to the emergency radio system and constructed several towers bringing the total owned by the County to 12. The County uses a tower in Alexandria that is owned by the New York State Department of Transportation (NYSDOT). These towers range from 37 to 91 meters in height. Refer to Table 3 below for the list of the County public safety radio tower locations.

TABLE 3: JEFFERSON COUNTY PUBLIC SAFETY RADIO TOWERS AND LOCATIONS

Jefferson County Radio Tower Locations						
Name	Address	Town	Lat	Long	Height	Owner
Antwerp	36369 US Route 11	Antwerp	44-11-41.50 N	75-37-33.00 W	190	Jefferson County
Babbits Corner	25246 County Route 189	Rodman	43-47-52.26 N	75-52-29.22 W	190	Jefferson County
Cape Vincent	34726 Mutton Ln	Cape Vincent	44-10-10.81 N	76-09-56.34 W	190	Jefferson County
Champion	19821 County Route 47	Champion	43-57-17.27 N	75-41-13.47 W	270	Jefferson County
County Highway	21997 County Route 51	Pamelia	44-00-00.62 N	75-55-51.10 W	250	Jefferson County
Lyme	10751 State Route 12E	Lyme	44-04-40.46 N	76-09-29.00 W	190	Jefferson County
Mannsville	15332 Mill St	Mannsville	43-42-19.61 N	76-04-05.83 W	250	Jefferson County
Redwood	28852 Cottage Hill Rd	Alexandria	44-17-27.46 N	75-47-43.49 W	190	Jefferson County
Adams	13265 Victory Ln	Adams	43-53-45.9 N	76-03-52.49 W	190	Jefferson County
Dry Hill	23094 Swan Rd	Watertown	43-57-21.86 N	75-50-25.75 W	190	Jefferson County
Theresa	330 Mill St	Theresa	44-12-50.74 N	75-47-02.72 W	250	Jefferson County
Collins Landing	43098 State Route 12	Alexandria	44-17-39.00 N	75-58-43.00 W	190	NYSDOT
Public Safety	753 Waterman Drive	City	43-97-34.36 N	75-92-64.37 W	160	Jefferson County

A map showing the locations of all wireless towers in the County appears in Figure 6 on the next page. Fiber optic transport is important as a high bandwidth backhaul to wireless last mile services.

JEFFERSON COUNTY, NY - Towers

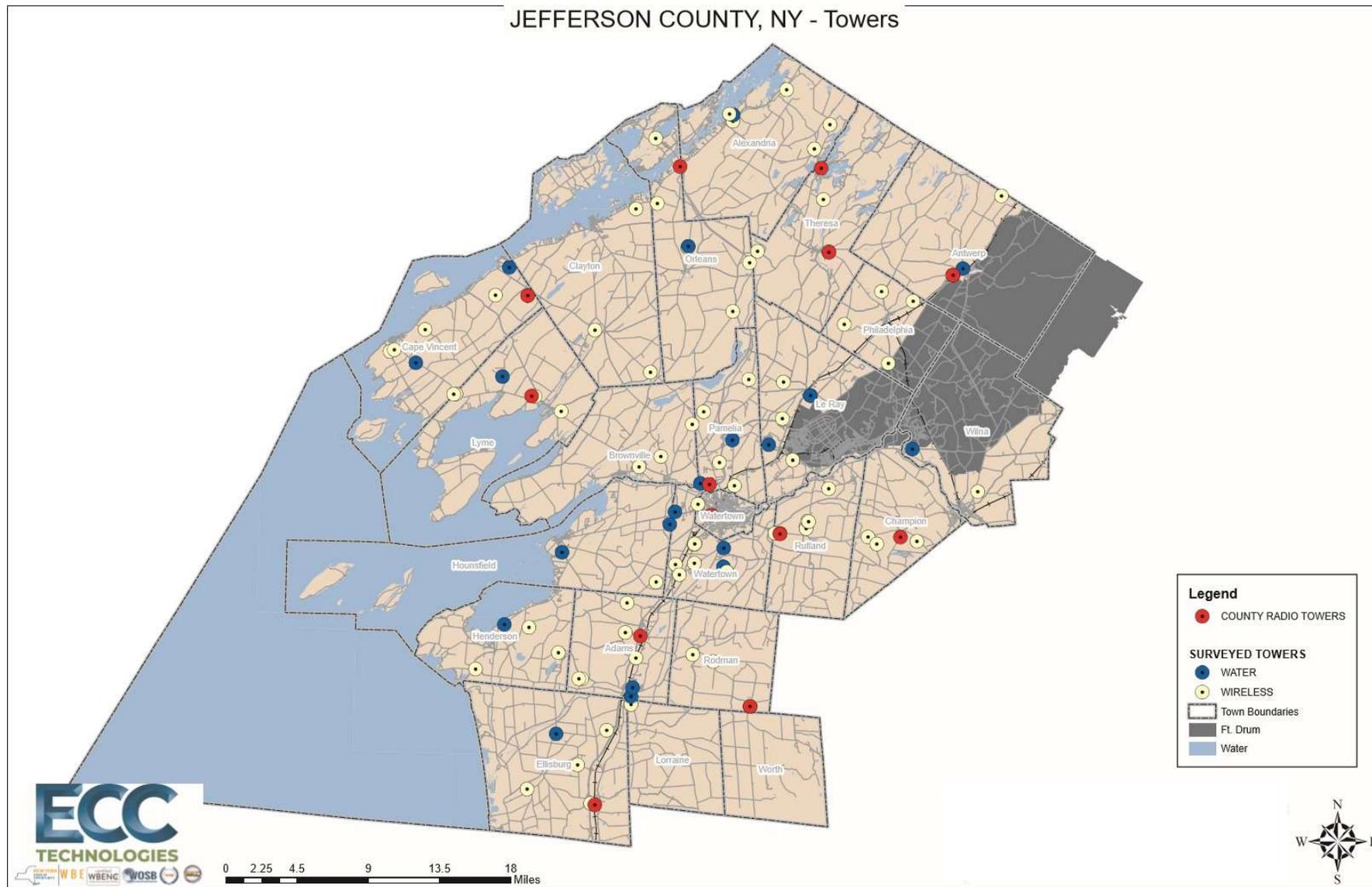


FIGURE 6: JEFFERSON COUNTY TOWERS

As part of the field study, ECC OSP personnel took pictures of towers in the County. Below are examples of two vertical structures in Jefferson County. These pictures are linked to the GIS mapping information and are important to Wireless Internet Service Providers (WISPs) and others as they highlight availability of vertical assets that could support the installation of access point equipment. This information will be provided electronically to DANC.



FIGURE 7: MONOPOLE TOWER

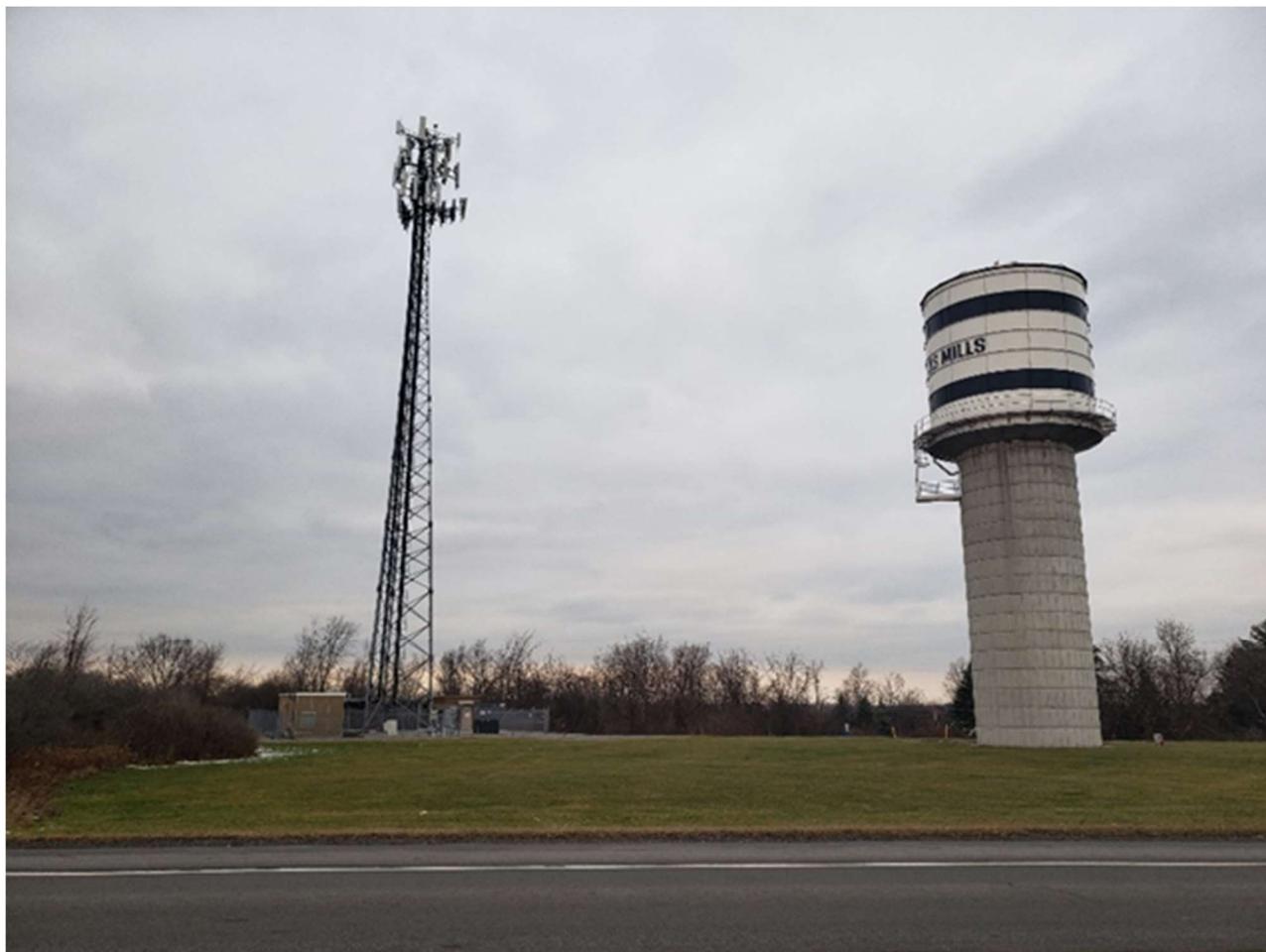


FIGURE 8: LATTICE TOWER AND WATER TOWER

4. Telecommunications Inventory

This section of the report is an inventory of the telecommunications service providers and their supporting landline and wireless infrastructure in Jefferson County. The data collected includes all relevant service providers including the incumbent service providers, the competitive service providers, the wide area network providers, and others.

Additional information is also included on specific provider infrastructure including fiber, wireline boundaries, Central Office locations, and wireless towers.

4.1 Telecommunications Service Providers in the County

Voice, video, and data services are provided to the County residents and businesses by a variety of companies using a range of technologies and infrastructures. Services can be provided over copper wire, coaxial cable, fiber optic cable, wireless technologies, and via satellite.

The incumbent telephone company, or ILEC (incumbent local exchange carrier) and the incumbent cable TV providers are the primary owners of telecommunications infrastructure within the County. There are also a couple CLECs (Competitive Local Exchange Carriers) focused on businesses only, an alternative fiber owner, a fiber owner connecting wireless points, three satellite providers, and several cellular companies.

Each of these providers uses different methods of delivering services to their customers, resulting in varying speeds and reliability. Typically, fiber provides the fastest, most reliable speeds, while coax, copper wire, wireless, and satellite provide the lowest and least reliable.

Copper wire is an older technology with limitations inherent to its structure; wireless speed and reliability are dependent on distance from the infrastructure and clear line of site; satellite can be compromised by weather or obstacles like foliage. These factors are important to bear in mind when determining whether businesses and residents truly have adequate access to effective Internet services.

4.2 ILECs, CLECs, and Region Wide Area Networks

A local telephone company or **incumbent local exchange carrier (ILEC)** is responsible for development and maintenance of the cabling and switching equipment needed to deliver local telephone and other telecom related services to the communities. The major ILECs providing service within the County are Citizens of Hammond, Frontier (formerly Citizens) TDS Telecom and Verizon.

Figure 9 is an ILEC map showing provider territory and Central Office locations in the County.

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JEFFERSON COUNTY, NY - TEL/ILEC Boundaries

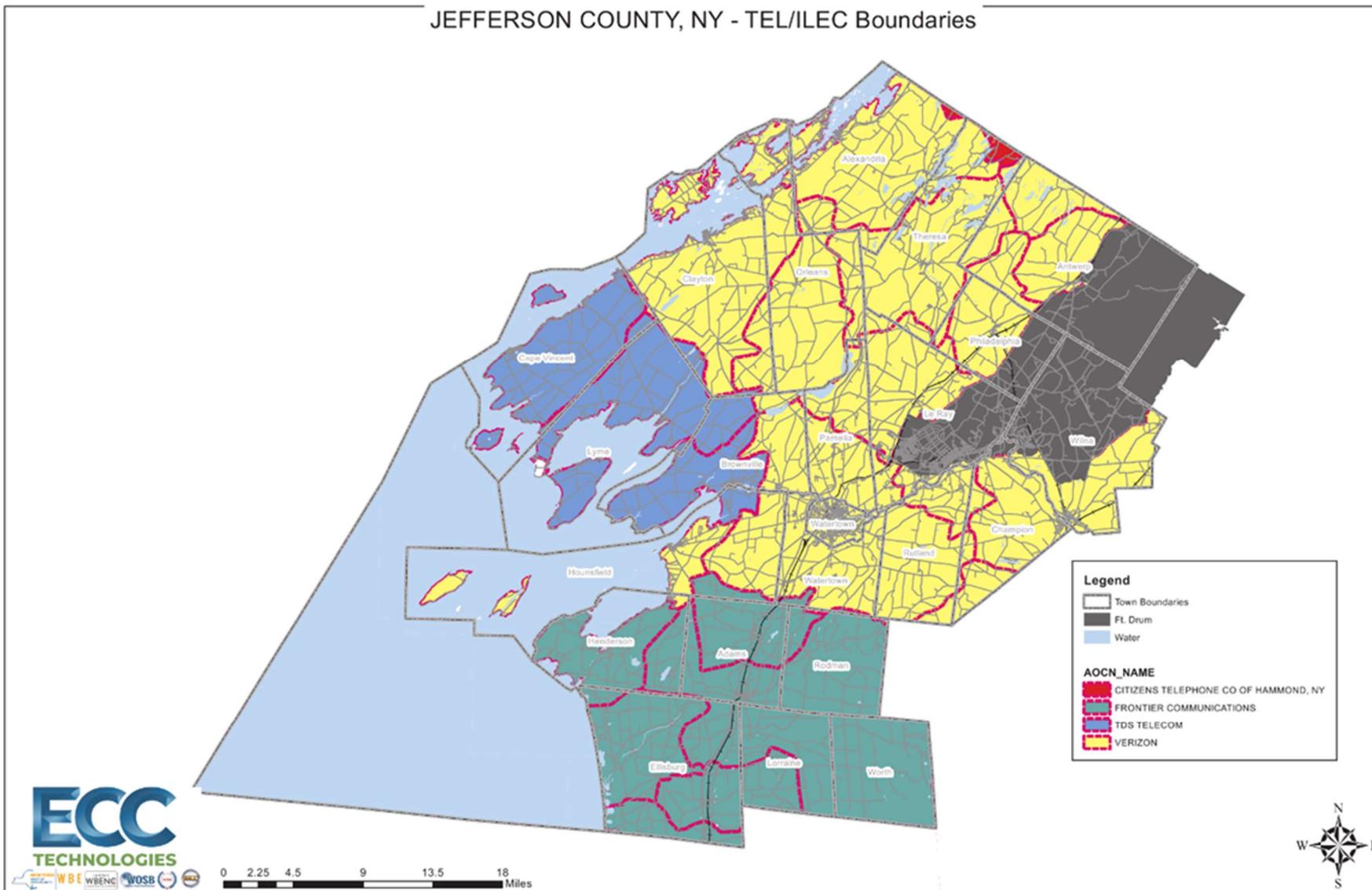


FIGURE 9: JEFFERSON COUNTY ILEC BOUNDARY MAP

Citizens Telephone Company of Hammond, NY

Citizens Telephone Company of Hammond, NY was founded 117 years ago and has a business office in Hammond, NY. According to the company website Citizens Telephone has over 1,800 end users. The company provides Internet via DSL and some FTTH service as well as telephone and cable TV to its residential and business customers. As can be seen on the territory map Citizens Telephone occupies a small area, approximately less than 5%, in the northeastern section of the County. It has a Central Office located outside the County in Hammond, NY that provides service to this area.

Below, Table 4, ¹⁸shows funds awarded to Citizens of Hammond through the New NY Grant. The table shows the Citizens of Hammond’s committed investment and the small number of homes to be serviced via FTTH.

TABLE 4: NEW NY GRANT AWARDS TO CITIZENS OF HAMMOND BY TOWNSHIP

New NY Grant Awards to Citizens of Hammond by Township			
Location	State Grant	Total Investment	Locations Addressed
Alexandria	\$21,922	\$27,402	6
Theresa	\$36,536	\$45,670	10

Frontier

Frontier is headquartered in Norwalk, Ct. Frontier has a regional office in Norwich, NY. Frontier is the incumbent telephone company for the southern third of the County. Frontier has six Central Offices that serve the County, five of which are inside the County and one outside. According to their website and the FCC 477 database, Frontier can provide DSL based residential Internet service that ranges from 1 to 115 Mbps down and .128 to 5 Mbps depending on customer location, as well as phone and TV service (DISH).

According to the New NY Grant website, Frontier has received over \$109,000 in state grant funds to provide FTTH service in previously underserved areas of the County. In Table 5 ¹⁷ below is a chart that lists the grant award, total investment, and number of homes to be served by Frontier in Jefferson County.

TABLE 5: NEW NY GRANT AWARD TO FRONTIER BY TOWNSHIP

New NY Grant Awards to Frontier by Township			
Location	State Grant	Total Investment	Locations Addressed
Worth	\$109,603	\$176,541	35

TDS Telecom

Telephone and Data Systems, or as it is more commonly known TDS, began in 1969. TDS is headquartered in Madison, WI, employs nearly 2,700 people, has territory in 33 states and is a subsidiary of Telephone and Data Systems, Inc. TDS offers Internet, Dish TV and traditional and VOIP phone service to residents and businesses.

TDS operates three COs along the central western region of the County, in an area that represents approximately 20% percent of the County. According to their form 477 submission they provide services include residential DSL between 5 and 100 Mbps depending on area and fiber-based services up to 300 Mbps.

TDS received over \$3M in state grant funds to provide new FTTH based service. As part of the grant funded build out TDS installed more than 124 miles of fiber-optic cable in Jefferson County. The infrastructure allows them to deliver Internet speeds from 25Mbps to 100 Mbps. ¹⁹

In Table 6 ¹⁷ below is a chart that lists the grant award, total investment, and number of homes to be served by TDS in Jefferson County.

TABLE 6: NEW NY GRANT AWARDS TO TDS TELECOM BY TOWNSHIP

New NY Grant Awards to TDS Telecom by Township			
Location	State Grant	Total Investment	Locations Addressed
Brownville	\$628,595	\$838,127	95
Cape Vincent	\$1,316,742	\$1,755,656	199
Cape Vincent	\$13,234	\$17,645	2
Clayton	\$291,139	\$388,185	44
Lyme	\$780,782	\$1,041,042	118

Verizon

Verizon’s corporate headquarters is in New York City with a regional business office located in Syracuse, NY. Verizon offers voice, data services, DSL, cloud services and managed network services to the businesses and residents in their area of the County. According to their 477 reporting, Verizon provides DSL services of 1.5 to 15 Mbps depending on customer location and had one census block that they were providing fiber based 940 Mbps service.

The Verizon territory covers the central, northern, and eastern area of the County. This area represents about half of the County. Verizon offers service from their nine Central Offices (CO’s) in the County, and two outside the County. According to the FCC report, Verizon offers DSL services of 1 to 15 Mbps in some areas and faster speeds where it offers fiber to the home included the locations listed below as part of the grant funding.

Table 7, on the following page, shows funds awarded to Verizon through the New NY Grant, which were over \$6.4M. In addition, the table shows Verizon’s total investment including the grant dollars and the number of homes to be serviced.²⁰

TABLE 7: NEW NY GRANT AWARDS TO VERIZON BY TOWNSHIP

New NY Grant Awards to Verizon by Township			
Location	State Grant	Total Investment	Locations Addressed
Alexandria (town)	\$975,341	\$1,687,311	184
Alexandria (village)	\$7,571	\$11,806	1
Antwerp	\$1,066,018	\$2,187,182	142
Brownville	\$271,099	\$407,325	52
Cape Vincent	\$3,030	\$3,788	1
Clayton	\$1,331,214	\$2,373,463	240
Orleans	\$2,101,831	\$3,592,523	304
Pamelia	\$7,571	\$21,946	1
Theresa (town)	\$683,156	\$1,044,226	164
Theresa (village)	\$3,030	\$3,788	1

Provider levels of service for non-residential customers are based on tariffed rates, Individual Case Basis pricing (ICB) and Service Level Agreements (SLAs) and are not reflective of what may be shown on their website. Also, installation of services charges may apply and can be a one-time charge or bundled into the monthly recurring cost.

The table at the end of this section describes the telecommunications services currently available at each of the ILEC's Central Offices with exchange numbers. These services are supported by the switch technology at the location of the Central Office and may or may not be available to a customer within the exchange. The service is dependent upon the cabling infrastructure available and the distance from the serving Central Office. The service information is based on the provider's 477 reporting as of June 2019.

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TABLE 8: JEFFERSON COUNTY CENTRAL OFFICES WITH SERVICES

Central Office	Copper	Fiber	Future RDOF Awarded Fiber
Citizens of Telephone of Hammond	DSL	FTTH	
Hammond	5 Mbps	100 Mbps	
Frontier	DSL	FTTH	FTTH
Adams	24 Mbps	n/a	Up to 1 GB
Adams Center	24 Mbps	n/a	
Ellisburg	24 Mbps	n/a	
Henderson	24 Mbps	n/a	
Mannsville	24 Mbps	n/a	
TDS	DSL	FTTH	FTTH
Cape Vincent	25 Mbps	1,000 Mbps	
Chaumont	25 Mbps	1,000 Mbps	
Dexter	25 Mbps	300 Mbps	
Verizon	DSL	FTTH	FTTH
Alexandria Bay	15 Mbps	n/a	
Antwerp	15 Mbps	n/a	
Black River	15 Mbps	n/a	
Carthage	15 Mbps	n/a	
Clayton	15 Mbps	n/a	
Evans Mills	15 Mbps	n/a	
LaFargeville	15 Mbps	n/a	
Philadelphia	15 Mbps	n/a	
Sackets Harbor	15 Mbps	n/a	
Theresa	15 Mbps	n/a	
Watertown	15 Mbps	n/a	

FCC Form 477-based services information was reported by carriers prior to the award of the fiber to the home grants. Since the providers have committed to 1 Gigabit service, that bandwidth speed will be available in the future, or already is offered in those select areas. With the RDOF awards, Citizens and Frontier has up to six years to complete their builds.

Further information regarding services in the area are listed at the end of this section.

On the following page is an ILEC map showing the two main providers' fiber infrastructure and Central Offices. Central Offices, or COs as they are better known, are typically brick buildings that house the telephone company voice switches and local network equipment. Based on this map, the general availability and level of Internet service provided by the ILECs can be made. ***As with all the outside plant (OSP) field generated maps, this map is considered confidential information and careful consideration should be given before it is copied or distributed.***

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JEFFERSON COUNTY, NY - TEL/ILEC Boundaries with RTs and COs

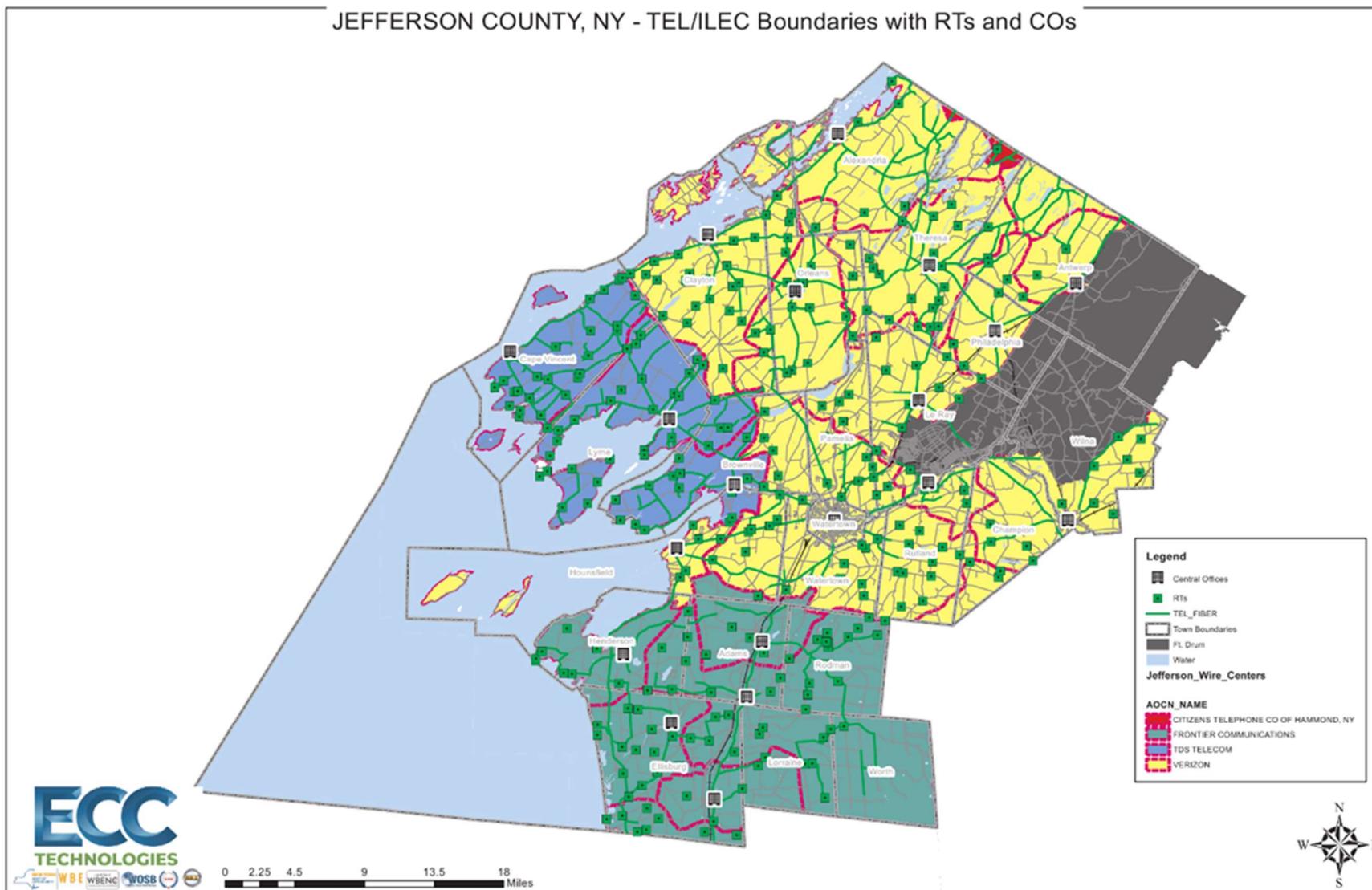


FIGURE 10: ILEC BOUNDARIES, CENTRAL OFFICES AND REMOTE TERMINALS

Telephone Company Fiber Routes and Fiber to the Home Areas

The map in Figure 11 on the next page, is based on the recent RDOF grant awards to Citizens of Hammond, TDS Telecom, Frontier and Verizon. This illustrates the areas where Fiber to the Home infrastructure has been or will be constructed within the County. These installations are primarily in the TDS Telecom and Verizon areas. However, Frontier has a small footprint in the town of Worth, where they have been awarded to build FTTH infrastructure. For these areas, fiber based last mile infrastructure allows for any future level bandwidth service an end user might require.

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JEFFERSON COUNTY, NY - TEL FTTH Areas

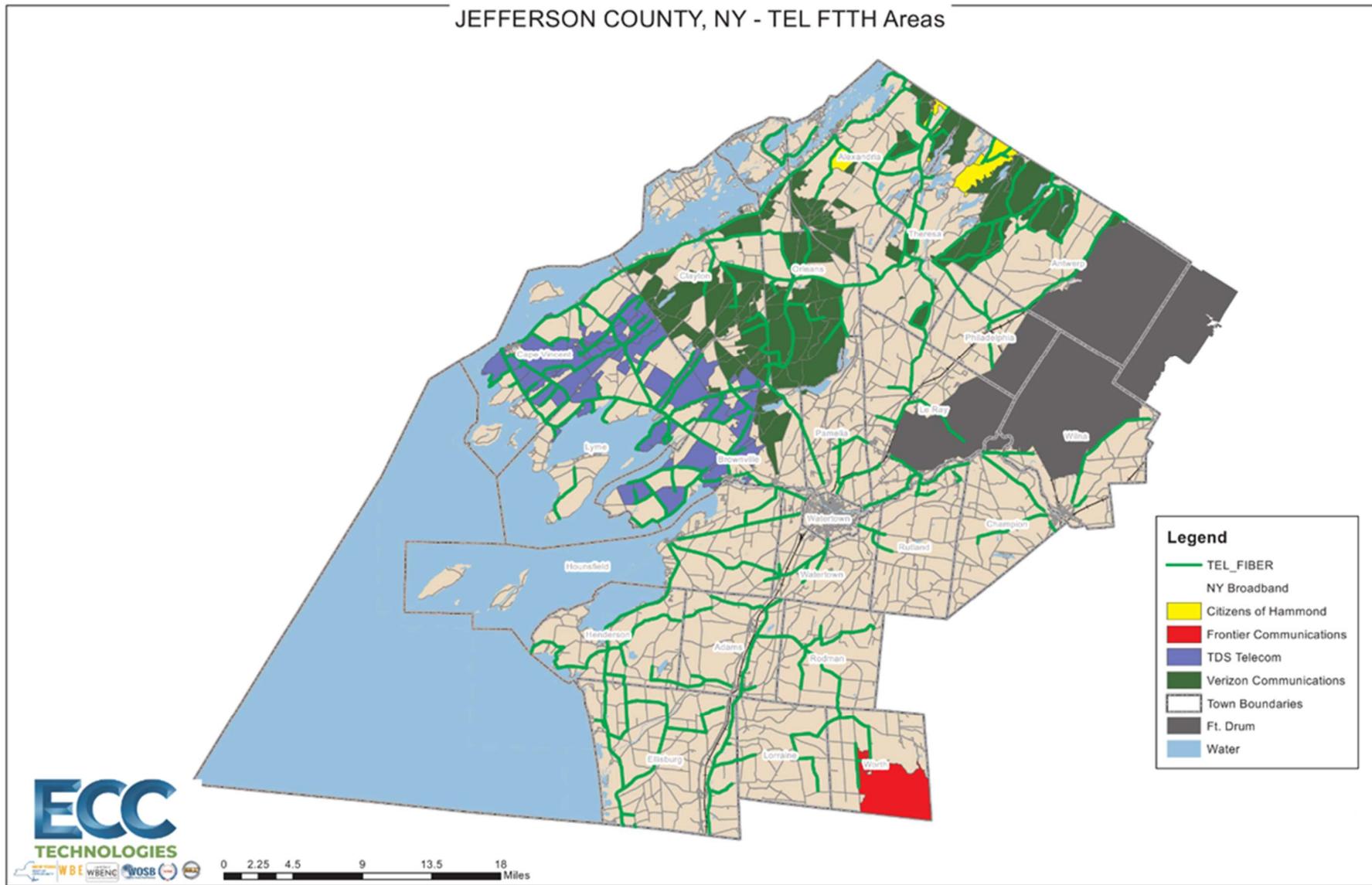


FIGURE 11: TELEPHONE COMPANY FTTH AREAS IN JEFFERSON COUNTY

Competitive Local Exchange Carriers (CLECs)

CLECs are telephone companies created to compete with the Incumbent Local Exchange Carriers (ILECs). CLECs arose because of the Telecommunication Act of 1996, which was intended to promote competition among long distance and local phone service providers.

The term is used to differentiate between new or potential competitors and established local exchange carriers. ECC identified four CLEC type companies with facilities in Jefferson County, NY. These CLECs include: FirstLight (FLTG), GTT Communications, Westelcom and Windstream with Westelcom being the only one that offers fiber-based services.

A CLEC that provides **regional wide area network** services is a company that either owns or leases fiber infrastructure in each area to connect customers to provide customer point to point internal communications or Internet access.

These companies typically target customers such as school districts or healthcare organizations that have multiple locations in a spread-out area. This type of provider can also provide access to another service provider, which is referred to as middle mile access or wholesale backhaul.

GTT Communications

GTT Communications is headquartered in McLean, VA with a regional office in Rochester, NY. GTT is a Tier 1 IP network based service provider that provides service to enterprises, carriers and government. According to their website, they provide connectivity between major commercial centers and secure, private connections to cloud based service providers. And their services include Transport and Infrastructure, Wide Area Networking, Internet, Advanced Solutions, and Enterprise Voice.²¹

According to their FCC 477 filing report, GTT reported providing low bandwidth copper-based services in Watertown to businesses only. They provide coverage in only 1 percent of that area, which means they have a small number of customers in the County.

Westelcom Communications Inc.

Westelcom Communications has been in the northern area of New York since 1981. Westelcom is headquartered in Watertown, has over 50 employees and is an offshoot of the Chazy Westport Telephone Company. In the past 15 years they have designed and constructed fiber networks throughout Northern New York. Their customer base consists of public organizations, vertical markets, non-profits, carriers, and small businesses.

Westelcom's portfolio of offerings include voice services, software defined WANs and unified communications solutions that integrate multiple platforms and dark fiber. Their data-based services include Fiber Internet, Dedicated Internet Access, and Ethernet. They have data centers with collocation facilities in Watertown, Plattsburgh, and Syracuse.²²

According to their FCC 477 filing report, Westelcom provides service in Watertown, Carthage, Clayton, and Black River.

Windstream (Earthlink)

Windstream Communications' headquarters is in Little Rock, Arkansas and has a business location in Fulton, NY. Windstream is a national incumbent telephone company that provides competitive service (CLEC) in some marketplaces.

According to their FCC 477 filing report, Windstream provides copper-based service to a few business customers, less than 2% coverage, in the Watertown area.

FirstLight (FLTG)

As of the date of the FCC 477 last report FirstLight is not providing CLEC based services in the County.

However, during the OSP field study, fiber cable connecting a cell tower back to several utility pole mounted antennas along the St. Lawrence river was found. This type of configuration is consistent with small cell and/or 5G service. Since FirstLight is not technically providing a telecommunications service to the area, they did not report service on the 477 form.

The map of Figure 12 represents the Competitive Local Exchange Carriers' fiber routes identified during the field study.

DANC is a regional owner of fiber and has a significant amount of fiber in the County. DANC will be discussed at length later in the section titled regional wide area networks.

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JEFFERSON COUNTY, NY - OTHER FIBER

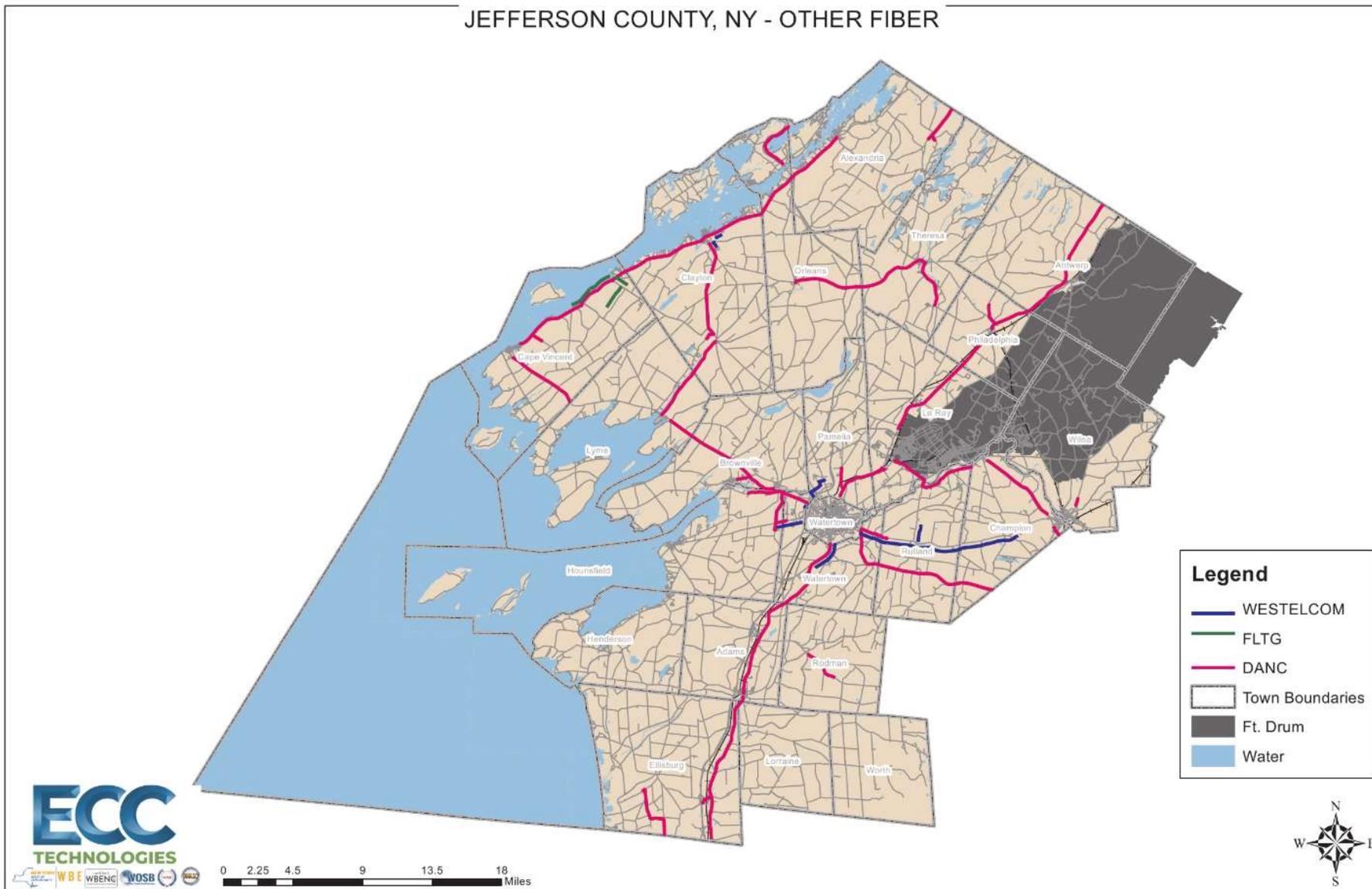


FIGURE 12: CLEC FIBER MAP IN JEFFERSON COUNTY, NY

4.3 Cable TV Provider

Cable providers, like all service providers, will typically build and provide new service where they deem it profitable. Should a company or residential customer purchase a service in an outlying area, and be willing to pay for the installation, the cable provider will expand access, providing service along that new route to businesses and residents. Cable providers offer their service via fiber optic or coaxial cable. **Spectrum Communications** (formerly Charter) and Castle Cable TV are the cable TV providers in the County.

Spectrum Communications and Castle Cable TV provide competitive services to the incumbent’s DSL service. These Cable TV companies (CATV) operate hybrid fiber/coaxial-based network systems in the County, which gives them the capability to provide dedicated business-based fiber services of ethernet, voice, video, managed services, and high bandwidth residential service over coaxial cable.

According to their FCC filing, Spectrum provides residential triple play services of voice, Internet, and cable TV. Internet prices start at \$49.99 for 100 Mbps service. Speeds of 940Mbps are offered to both residential and business customers. Business service packages start at 200Mbps and include business voice services with no contracts.

Castle Cable TV, Inc. is located at 26 South Main Street, Hammond, NY. Castle Cable TV is a subsidiary of Citizens Telephone Company of Hammond, NY. Castle Cable TV, Inc. was acquired by Citizens Telephone Company in 2000. They provide phone, Internet, cable TV and security system services to its customers. Their Internet service ranges from 1 Mbps/256k to 100/25 Mbps.

In 2010 Castle Cable TV was awarded a USDA broadband grant of \$7.2 million to build new infrastructure and provide high bandwidth services to Alexandria Bay and the surrounding area. With this funding, Castle Cable TV expanded its service territory from Alexandria Bay to the southwest portion of the town of Morristown along the St. Lawrence River.

Castle Cable TV also received a New NY broadband award as shown in Table 9 below: ²³

TABLE 9: NEW NY GRANT AWARDS TO CASTLE CABLE TV BY TOWNSHIP

New NY Grant Awards to Frontier by Township			
Location	State Grant	Total Investment	Locations Addressed
Alexandria (town)	\$392,284	\$490,356	80
Alexandria Bay (village)	\$186,335	\$232,919	38
Theresa	\$53,939	\$67,424	11

A map showing Spectrum and Castle Cable fiber and coaxial infrastructure is shown below. Both fiber and coax can be used to provide broadband service. Based on this map, the general availability and level of Internet service provided by the Cable Television (CATV) provider can be made.

As part of the Charter Communications/Time Warner Cable merger that formed Spectrum, New York State required Spectrum to expand its network to pass 145,000 unserved and underserved homes in rural areas of the State. As of July 19, 2019, Spectrum had expanded its service area to 65,000 of the required 145,000 homes. Though not made publicly available, Spectrum has been given until September 2021 to complete its expansion by the State of New York.²⁴

As with all the outside plant (OSP) field generated maps, this map is considered confidential information and careful consideration should be given before it is copied or distributed.

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JEFFERSON COUNTY, NY - CATV COAX & FIBER

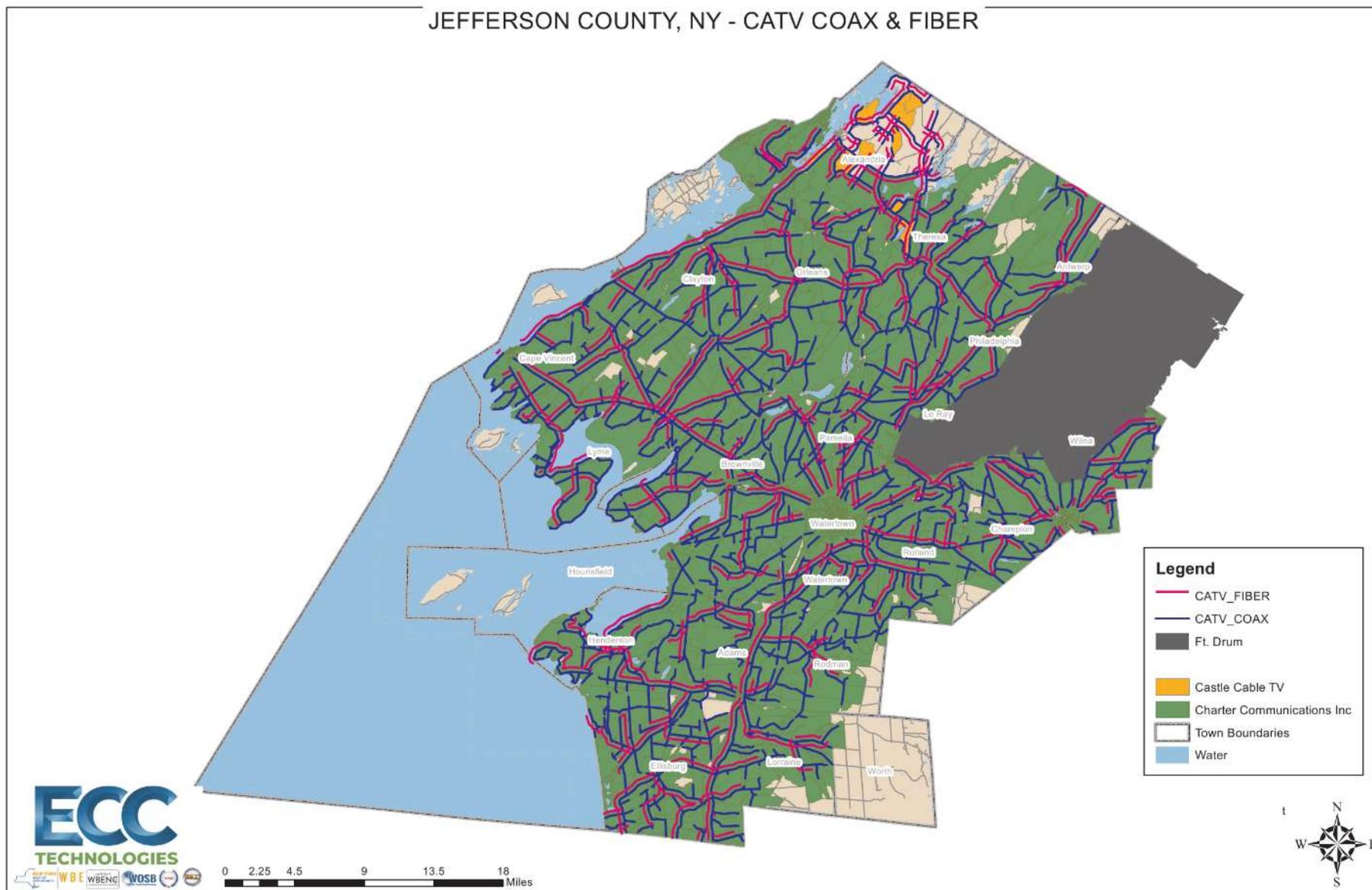


FIGURE 13: JEFFERSON COUNTY, NY - CATV COAX & FIBER

4.4 Wireless Internet Service Providers (WISPs)

King Street Wireless

King Street Wireless, L.P. is the only fixed wireless provider identified in this study. They are headquartered in Alexandria, VA and offer an advertised 1 Mbps at 700 MHz based service with coverage throughout most of the County. Due to its very limited bandwidth offering, King Street is not considered a viable broadband option in Jefferson County at this time.

4.5 Satellite

Satellite providers use geostationary satellites orbiting the Earth at the same speed of the Earth's rotation, allowing them to maintain a "fixed" position to transmit signals from the Network Operations Center (NOC) to a satellite dish mounted on a business or residential structure.

According to their 477 reports, two satellite providers claim 100% residential coverage in Jefferson County. HughesNet advertises speeds of 25Mbps by 3Mbps. Viasat lists speeds of up to 100 Mbps. As with all satellite providers, one of the greatest issues with service is latency, which is typically 0.5 seconds in length. This can prove problematic with VPN connections or when users are engaging in time sensitive activities, such as video conferencing and live online gaming.

Current NY Broadband Program funding will enable HughesNet to deploy its new Gen5 satellite broadband service, offering download speeds of at least 25 Mbps to the awarded Census Blocks. The grant-supported service area will have a monthly rate not to exceed \$60, with an installation fee not to exceed \$49. These are lower than the provider's current price offerings.

The **HughesNet** service plan has a monthly usage allowance. Exceeding the monthly allowance can result in slower service. But the service will not have additional charges. HughesNet has committed to the state to use its best efforts to deliver download speeds of 3 Mbps when a user's data plan has been exceeded, but with no guarantees.

On the next page is a chart that shows the New NY Broadband grant to HughesNet and its total investment. Also shown are the number of locations addressed or to be served by village or township.

TABLE 10: NEW NY BROADBAND GRANT TO HUGHESNET

Location	State Grant	Total Investment	Locations Addressed
Adams (Town)	\$10,395	\$14,850	66
Alexandria (Town)	\$18,113	\$26,957	114
Alexandria Bay (Village)	\$1,260	\$1,800	8
Antwerp (Town)	\$61,583	\$175,418	217
Antwerp (Village)	\$158	\$225	1
Brownville (Town)	\$2,993	\$4,594	18
Cape Vincent (Town)	\$13,703	\$19,575	87
Cape Vincent (Village)	\$158	\$225	1
Champion (Town)	\$33,233	\$79,223	124
Chaumont Village)	\$158	\$225	1
Clayton (Town)	\$83,003	\$125,952	465
Clayton (Village)	\$630	\$900	4
Ellisburg (Town)	\$25,043	\$36,360	158
Henderson (Town)	\$21,105	\$30,150	134
Hounsfield (Town)	\$29,925	\$50,227	137
LeRay (Town)	\$37,013	\$53,756	231
Lorraine (Town)	\$20,475	\$33,281	125
Lyme (Town)	\$945	\$1,350	6
Orleans (Town)	\$23,468	\$38,788	91
Pamelia (Town)	\$4,725	\$12,470	18
Philadelphia (Town)	\$7,875	\$21,584	32
Rodman (Town)	\$40,005	\$58,764	252
Rutland (Town)	\$47,880	\$93,716	185
Theresa (Town)	\$5,040	\$7,200	32
Theresa (Village)	\$315	\$450	2
Watertown (City)	\$20,318	\$29,025	129
Watertown (Town)	\$5,513	\$10,587	21
Wilna (Town)	\$1,733	\$6,148	8
Worth (Town)	\$34,020	\$51,416	216

4.6 Cellular Service Providers

There are three national cellular service providers with complete or partial coverage in Jefferson County with varying connection speeds. The providers' website coverage maps for **AT&T Wireless**, **T-Mobile** and **Verizon Wireless** show they provide 4G LTE coverage, with AT&T and T-Mobile also provide 5G in some areas.

Cellular providers use radio frequencies to complete phone calls, send text messages, and transmit data from the nearest cell tower to the phone in use. Antennas on the towers both transmit and receive signals from mobile phones.

Cellular signals can be impacted by distance between the phone and tower, building wall thickness, hills, or other structures. Clear line-of-sight is not necessary for cellular service to work, but will increase call clarity and data transmission speed.

In addition to these traditional providers, Spectrum Mobile is a new cellular provider that uses Verizon's towers and relies on a network of Wi-Fi hotspots to keep costs low. However, to qualify for Spectrum Mobile the customer must have Spectrum Internet service. US Cellular offers data and voice coverage in the County through a national partner and is therefore considered in the marketplace as a reseller and not as a facilities-based provider.

In terms of 5G/4G coverage in the County, each respective provider's website shows the following.

- AT&T has complete coverage with 5G in approximately two thirds of the County.
- T-Mobile has 5G coverage in many areas and 4G along border areas in the west and northern areas.
- Verizon has 4G coverage in most of the County, except a small area in the southern border.

4.7 Regional Wide Area Networks – DANC

In 1985 the Development Authority of the North Country (DANC) was created by the New York State Legislature to develop and manage the infrastructure needed to help support Fort Drum, and to support the shared interests of Jefferson, Lewis, and St. Lawrence Counties. The Authority operates as a revenue-based public benefit corporation and is independent of state funding. DANC's main office is in the Dulles State Office Building in Watertown, NY.

In 2003, DANC completed the initial build of what would become a large regional fiber system. This system connects school districts and colleges across the areas north of the NYS Thruway, to the Internet. The DANC fiber system is a carrier-class telecommunications network that connects this region to carrier collocation facilities in Albany, Syracuse, and New York City.

The DANC fiber system consists of over 1,800 miles of fiber and 31 Central Offices (COs).²⁵ These Central Office locations are used for cross connection of networks and provider equipment. The current fiber system was completed years ago, with laterals, extensions, and new builds ongoing.

As shown in Figure 14 below, the DANC fiber system is represented by the red line and the central offices are the yellow dots. DANC has a high strand count Open Access backbone fiber cable that routes diagonally north and south and east and west through the middle of Jefferson County, with spurs and secondary routes branching out for many of the routes.

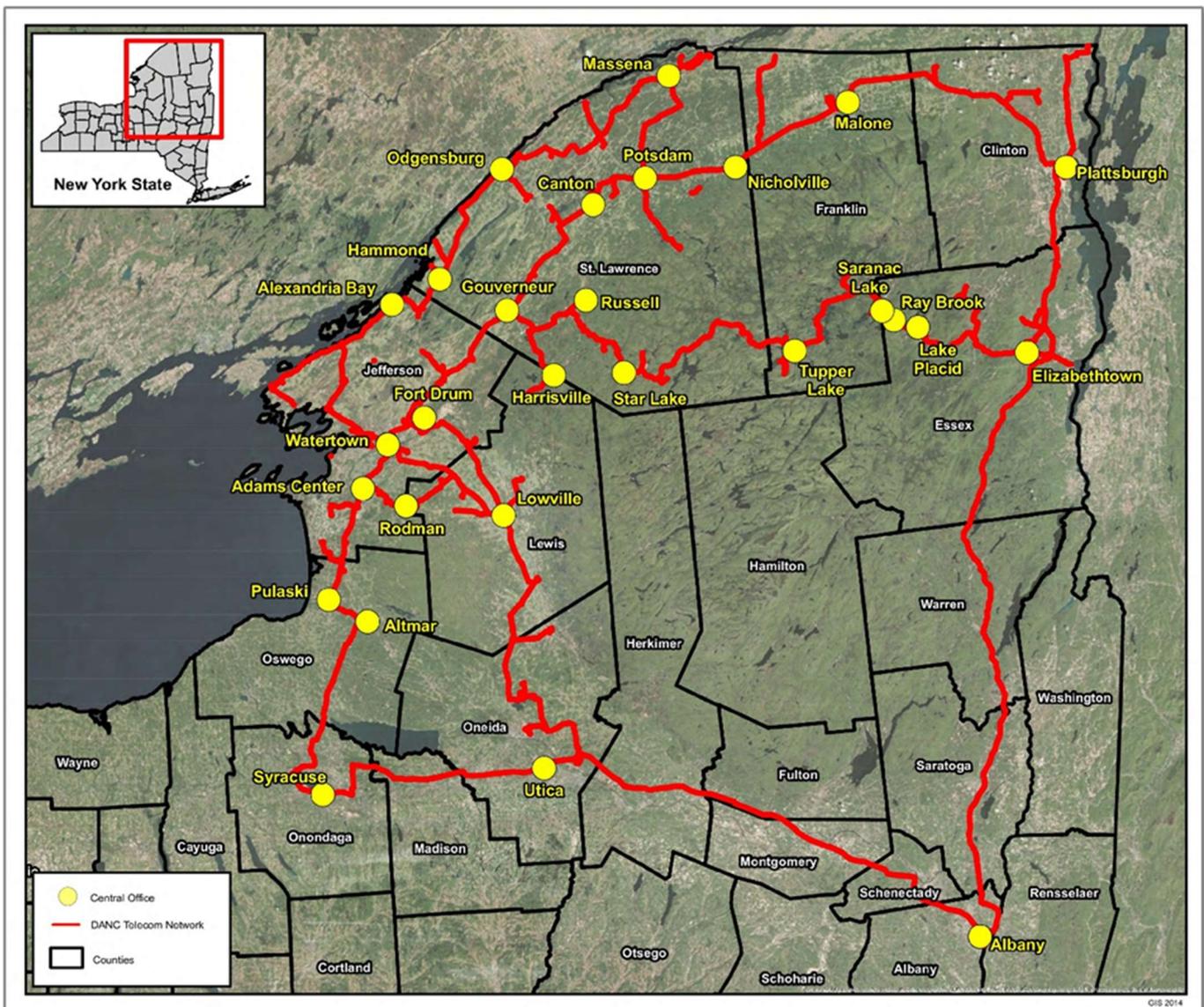


FIGURE 14: DANC NETWORK

In addition to connecting the educational institutions, the fiber is also being made available to any type of service provider. The DANC fiber was built on an open access model and is available to any viable service provider.

According to its website, DANC provides lit services and dark fiber, including: TDM Services, Ethernet Services, Wavelength Services and Private Networks. DANC connects many anchor institutions across the

region including over 100 healthcare facilities, approximately 70 schools, 40 libraries as part of the North Country Library System and more than 150 cell towers.

TABLE 11: DANC SERVICE OFFERINGS

Category	TDM Services	Ethernet Services	Wavelength Services	Private Networks
Description	Traditional SONET based transport service including DS-1, DS-3, and OC-X service. Multiplexing and cross-connect service also available.	Ethernet transport service including 10 Mbps, 100 Mbps, 1Gbps, and 10 Gbps. Higher bandwidth available if required. Includes Virtual LAN service.	Offerings include 2.5 Gbps, 10 Gbps and 100 Gbps wavelengths.	Private networks are high-speed networks connecting multiple locations. Examples include FDRHPO telemedicine network, Jeff-Jefferson BOCES, and St. Lawrence-Jefferson BOCES.
Availability	Throughout the entire network.	Throughout the entire network.	Throughout the entire network.	Private networks are available anywhere and are based on the requirements of each customer.

Although DANC limits its service offerings to those found in Table 11 above, DANC is willing to consider build out and maintenance of wireless or GPON infrastructure in partnership with other firms providing the Internet access, customer billing and support.

DANC’s regional upstate NY fiber system has several service providers using it, including CLECs, FTTH providers, and long-haul carriers such as Verizon Wireless, AT&T, Slic and Westelcom. DANC has a central office or colocation in Adams Center, Rodman, Watertown, Fort Drum, and Alexandria Bay, NY.

4.8 Broadband Availability & Service Gaps

Broadband providers must submit data to the FCC twice per year on broadband deployments. Form 477 is the FCC nomenclature which establishes the format of the data submitted. This FCC data is only granular to the census block level; meaning that **if one household within a block is served by that provider, the whole block is reported as being served.**

Throughput on Form 477 is reported within speed tiers/ranges and reflects the maximum advertised download and upload speeds within that block, by that provider. Said differently, the information by its very nature is **overstated** by the providers.

This data provides an accurate though dated foundation of general broadband availability in a region and can be utilized as a planning tool by capturing which providers are active in which areas or census blocks. However, the Form 477 data does not capture the exact service available to each home within a block.

The map in Figure 15 shows Citizens of Hammond, Frontier, TDS Telecom and Verizon availability for fixed landline broadband services at the maximum available speeds within the County boundaries. Figure 16 displays a map showing the same criteria from Spectrum.

These maps were created by ECC using the publicly available FCC Form 477 datasets. The different colors represent various speeds of service, ranging from no service up to 1 Gigabit. The different colors designate the different speeds offered according to their website. This information will be used to make comparisons to the field inventory study.

The Form 477 information is at least 12 months old and as new network expansions in the County are “turned up,” many of the areas below shown at less than 10 Mb/s speeds will get changed accordingly. The FCC data is often inconsistent with data from private reporting sources and sometimes the provider websites.

In Figure 16, ECC overlaid the CATV fiber and coaxial data layer onto the FCC served census blocks data. Upon closer inspection, it becomes apparent as to where the coaxial cable ends while the entire census block is counted as being served. That said, there are partial census block areas that remain unserved but not eligible for grant funding under the current grant program rules.

Figure 17 shows the broadband infrastructure discovered and documented in the County field survey overlaid on census blocks with color coded population densities.

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JEFFERSON COUNTY, NY - FCC477 ILEC Max Ad Down

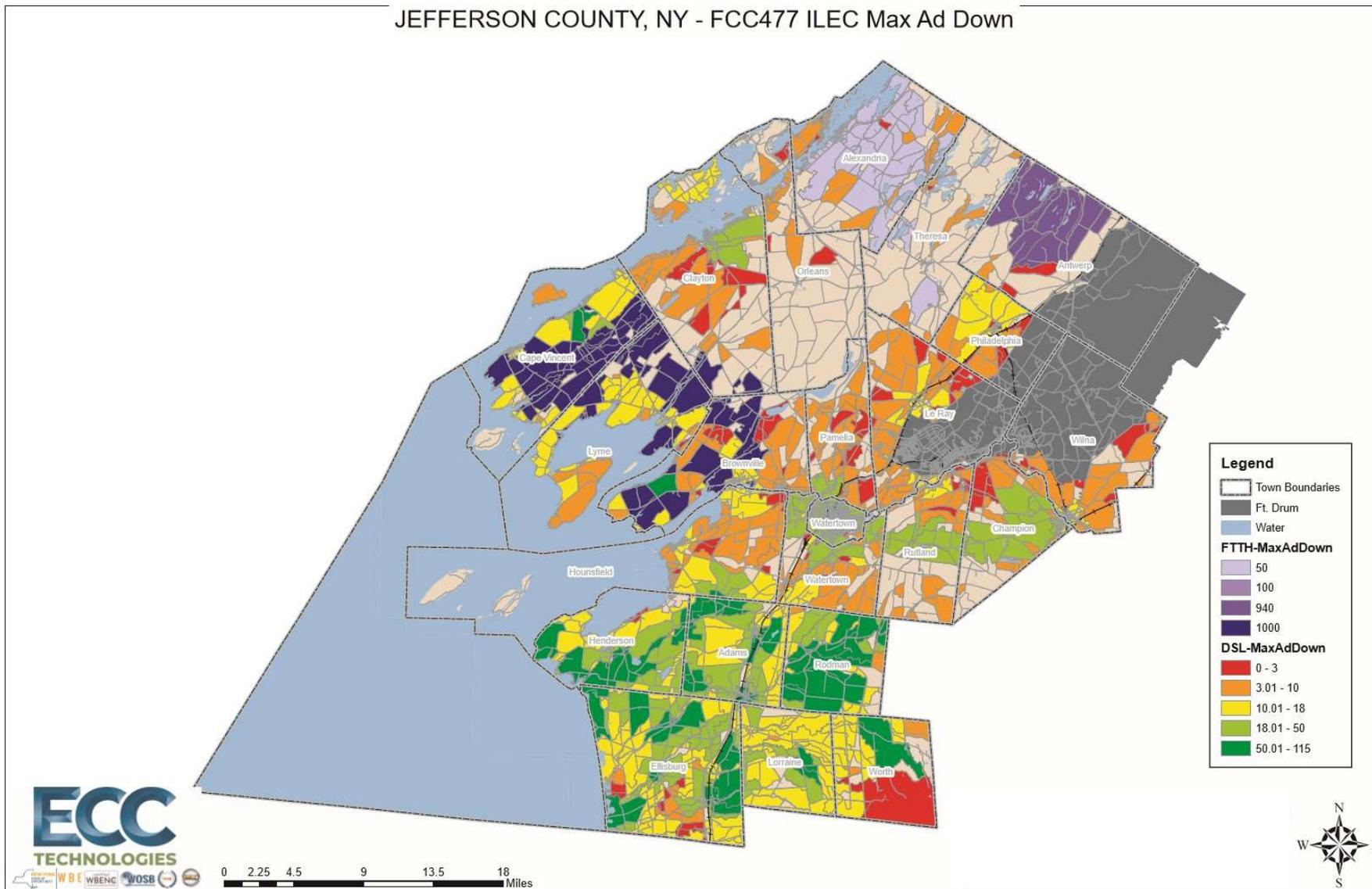


FIGURE 15: FCC 477 DATA - ILEC MAXIMUM ADVERTISED DOWNLOAD SPEEDS

JEFFERSON COUNTY, NY - FCC477 CATV Coax/Fiber

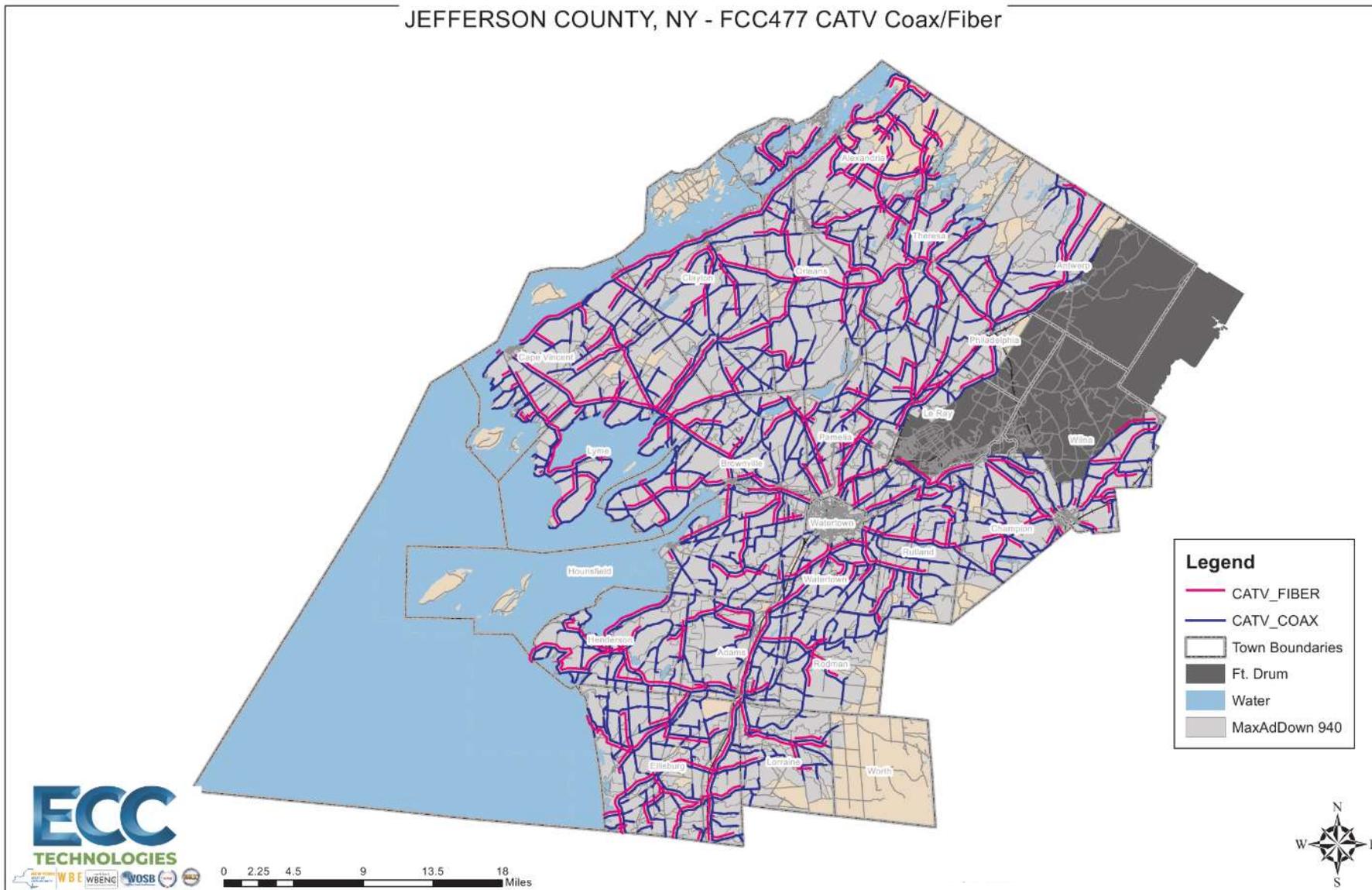


FIGURE 16: FCC 477 DATA - CABLE TELEVISION MAXIMUM ADVERTISED DOWNLOAD SPEEDS

JEFFERSON COUNTY, NY - 2010 Population with Infrastructure

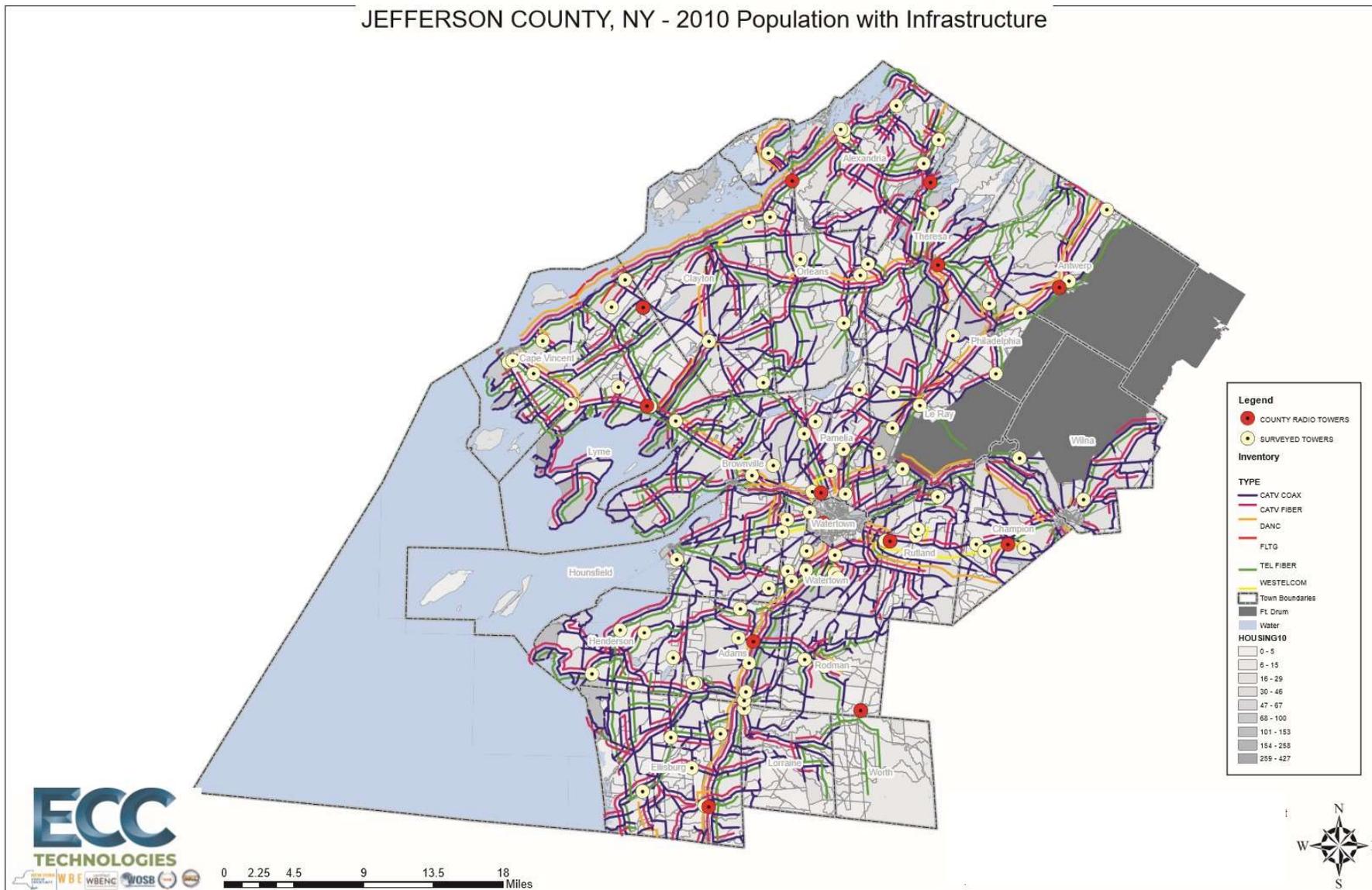


FIGURE 17: JEFFERSON COUNTY POPULATION AND INFRASTRUCTURE

Initial Target Areas for Expansion

The RDOF program allowed for applications in areas previously awarded to HughesNet through the New NY Broadband program. There are census blocks in the County that were awarded through the New NY program to HughesNet and through the RDOF program to Citizens Vermont Acquisition Corporation (Citizens of Hammond), Frontier and SpaceX.

Furthermore, the first two rounds of the ReConnect grant program likewise allowed for applications in census blocks previously awarded to HughesNet by the NYS grant program.

If the third round of ReConnect is consistent with the first two rounds, applications for grant/loans in census blocks that were previously awarded to HughesNet by NYS may be available. The third round of the USDA ReConnect program is anticipated to be available by the end of the year.

On the following page is a map that shows the areas of the County that were awarded to HughesNet by the New NY Broadband Grant program, and not awarded through the RDOF program. These areas represent 2,884 households in the County. These could become new grant target areas and should be considered for future broadband initiatives.

JEFFERSON COUNTY, NY - Potential Grant Eligible Areas

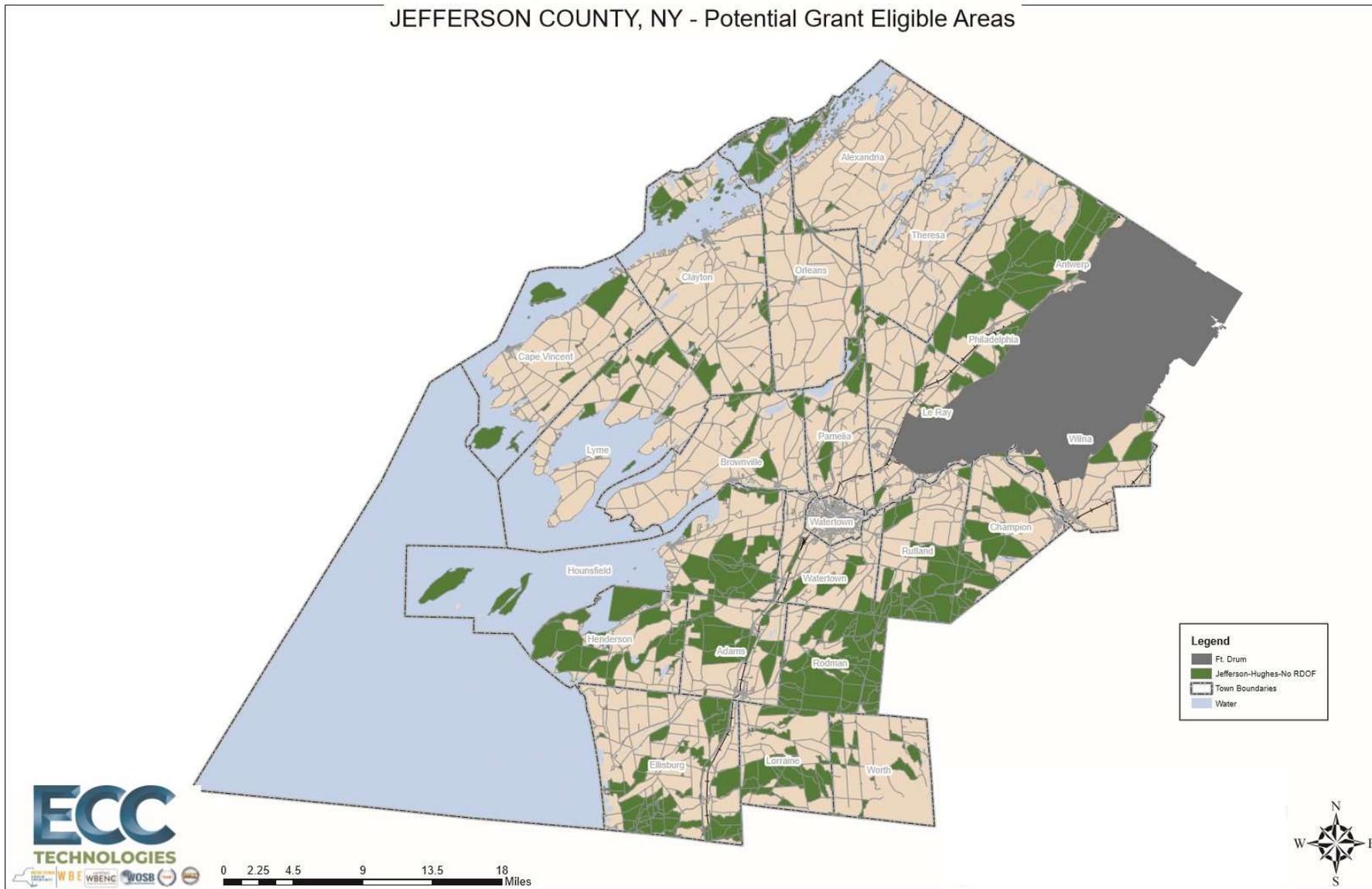


FIGURE 18: NEW NY BROADBAND GRANT AWARD TO HUGHESNET WITH RDOF AREAS REMOVED

4.9 Broadband Providers and Speeds by Town and Zip Code.

The following pages list Internet providers, type of service offered, coverage area and the maximum speed advertised for Jefferson County by municipality. This information was gathered by keying in zip codes from an online database at BroadbandNow.com that utilizes the FCC 477 information.

There are several towns and villages listed that are outside the County but have zip code-based areas in the County. The zip code map is shown below for illustrative purposes and can be used as a key to assist with identifying provider service.

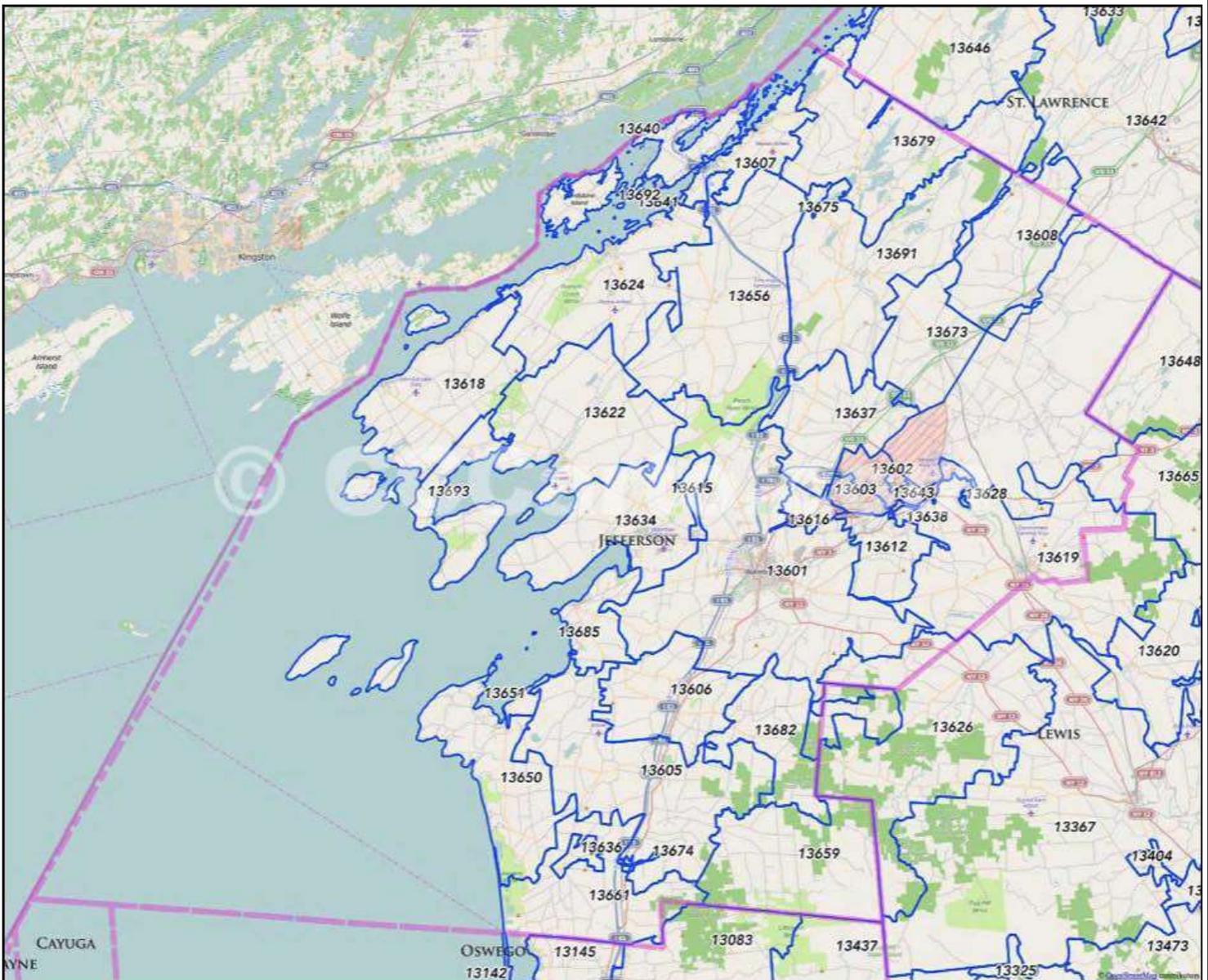


FIGURE 19: JEFFERSON COUNTY ZIP CODE MAP

Jefferson County Locations
Zip Code
Summary of Internet Providers in Watertown
13601

Provider	Type	Coverage	Speed
King Street Wireless	Fixed Wireless	97.7%+	1.0 Mbps
Charter Spectrum	Cable	97.2%+	940 Mbps
Frontier Communications	DSL	1.4%+	24 Mbps
Viasat Internet (formerly Exede)	Satellite	100.0%	100 Mbps
HughesNet	Satellite	100.0%	25 Mbps
Spectrum Business	Cable and Fiber	100.0%	940 Mbps
Westelcom Network	Fiber	25.2%+	-- Mbps
Frontier Business	DSL	6.9%+	24 Mbps
CenturyLink Business	Copper	1.7%+	45 Mbps
GTT Communications	Copper	1.2%+	-- Mbps
Windstream	Copper	1.1%+	1.5 Mbps
Verizon	DSL Fiber	90.7%+	15 Mbps

Summary of Internet Providers in Fort Drum
13602

Provider	Type	Coverage	Speed
Charter Spectrum	Cable	100.0%	940 Mbps
King Street Wireless	Fixed Wireless	100.0%	1.0 Mbps
Viasat Internet (formerly Exede)	Satellite	100%	100 Mbps
HughesNet	Satellite	100%	25 Mbps
Spectrum Business	Cable and Fiber	100%	940 Mbps
Verizon	DSL Fiber	27.5%+	15 Mbps

Summary of Internet Providers in Watertown/Fort Drum
13603

Provider	Type	Coverage	Speed
Charter Spectrum	Cable	100.0%	940 Mbps
King Street Wireless	Fixed Wireless	100.0%	1.0 Mbps
Viasat Internet (formerly Exede)	Satellite	100%	100 Mbps
HughesNet	Satellite	100%	25 Mbps
Spectrum Business	Cable	100%	940 Mbps

Summary of Internet Providers in Adams
13605

Provider	Type	Coverage	Speed
Frontier Communications	DSL	87.9%+	24 Mbps
Charter Spectrum	Cable	87.8%+	940 Mbps
King Street Wireless	Fixed Wireless	78.2%+	1.0 Mbps
Viasat Internet (formerly Exede)	Satellite	100.0%	100 Mbps
HughesNet	Satellite	100%	25 Mbps
Frontier Business	DSL	100%	24 Mbps
Spectrum Business	Cable and Fiber	79.7%+	940 Mbps

Summary of Internet Providers in Adams Center
13606

Provider	Type	Coverage	Speed
King Street Wireless	Fixed Wireless	97.4%+	1.0 Mbps
Charter Spectrum	Cable	88.7%+	940 Mbps
Frontier Communications	DSL	84.9%+	24 Mbps
Viasat Internet (formerly Exede)	Satellite	100.0%	100 Mbps
HughesNet	Satellite	100.0%	25 Mbps
Frontier Business	DSL	100.0%	24 Mbps
Spectrum Business	Cable and Fiber	90.8%+	940 Mbps
Verizon	DSL Fiber	3.3%+	15 Mbps

Summary of Internet Providers in Alexandria Bay
13607

Provider	Type	Coverage	Speed
Castle Cable TV	Fiber and Cable	89.5%+	100 Mbps
Charter Spectrum	Cable	7.3%+	940 Mbps
Viasat Internet (formerly Exede)	Satellite	100%	100 Mbps
HughesNet	Satellite	100%	25 Mbps
Castle Cable TV	Fiber	91.2%+	100 Mbps
Spectrum Business	Cable	11.8%+	940 Mbps
Verizon	DSL Fiber	96.7%+	15 Mbps

Summary of Internet Providers in Antwerp
13608

Provider	Type	Coverage	Speed
King Street Wireless	Fixed Wireless	99.4%+	1.0 Mbps
Charter Spectrum	Cable	74.1%+	940 Mbps
Viasat Internet (formerly Exede)	Satellite	100%	100 Mbps
HughesNet	Satellite	100%	25 Mbps
Spectrum Business	Cable	100%	940 Mbps
Verizon	DSL Fiber	31.4%+	15 Mbps

Summary of Internet Providers in Black River
13612

Provider	Type	Coverage	Speed
King Street Wireless	Fixed Wireless	99.7%+	1.0 Mbps
Charter Spectrum	Cable	92.5%+	940 Mbps
Viasat Internet (formerly Exede)	Satellite	100%	100 Mbps
HughesNet	Satellite	100%	25 Mbps
Spectrum Business	Cable	87.0%+	940 Mbps
Westelcom Network	Fiber	34.5%+	-- Mbps
Verizon	DSL Fiber	90.6%+	15 Mbps

Summary of Internet Providers in Brownville
13615

Provider	Type	Coverage	Speed
Charter Spectrum	Cable	100%	940 Mbps
King Street Wireless	Fixed Wireless	76.8%+	1.0 Mbps
Viasat Internet (formerly Exede)	Satellite	100%	100 Mbps
HughesNet	Satellite	100%	25 Mbps
Spectrum Business	Cable	100%	940 Mbps
Verizon	DSL Fiber	99.3%+	15 Mbps

Summary of Internet Providers in Calcium
13616

Provider	Type	Coverage	Speed
Charter Spectrum	Cable	100%	940 Mbps
King Street Wireless	Fixed Wireless	100%	1.0 Mbps
Viasat Internet (formerly Exede)	Satellite	100%	100 Mbps
HughesNet	Satellite	100%	25 Mbps
Spectrum Business	Cable	100%	940 Mbps
GTT Communications	Copper	2.8%+	-- Mbps
Verizon	DSL Fiber	76.1%+	15 Mbps

Summary of Internet Providers in Cape Vincent
13618

Provider	Type	Coverage	Speed
TDS Telecom	DSL and Fiber	90.1%+	300 Mbps
Charter Spectrum	Cable	100%	940 Mbps
Viasat Internet (formerly Exede)	Satellite	100%	100 Mbps
HughesNet	Satellite	100%	25 Mbps
Spectrum Business	Cable	100%	940 Mbps
TDS Business	Fiber	5.3%+	300 Mbps
Verizon	DSL Fiber	3.8%+	15 Mbps

Summary of Internet Providers in Carthage

13619

Provider	Type	Coverage	Speed
King Street Wireless	Fixed Wireless	99.8%+	1.0 Mbps
Charter Spectrum	Cable	97.9%+	940 Mbps
Viasat Internet (formerly Exede)	Satellite	100%	100 Mbps
HughesNet	Satellite	100%	25 Mbps
Spectrum Business	Cable and Fiber	100%	940 Mbps
Westelcom Network	Fiber	20.6%+	-- Mbps
Verizon	DSL Fiber	90.1%	15 Mbps

Summary of Internet Providers in Chaumont

13622

Provider	Type	Coverage	Speed
TDS Telecom	DSL and Fiber	73.0%+	300 Mbps
Charter Spectrum	Cable	100%	940 Mbps
Viasat Internet (formerly Exede)	Satellite	100%	100 Mbps
HughesNet	Satellite	100%	25 Mbps
Spectrum Business	Cable	100%	940 Mbps
TDS Business	Fiber	6.9%+	300 Mbps
Verizon	DSL Fiber	8%	15 Mbps

Summary of Internet Providers in Clayton

13624

Provider	Type	Coverage	Speed
Charter Spectrum	Cable	96.3%+	940 Mbps
TDS Telecom	DSL and Fiber	18.1%+	300 Mbps
Viasat Internet (formerly Exede)	Satellite	100%	100 Mbps
HughesNet	Satellite	100%	25 Mbps
Spectrum Business	Cable and Fiber	100%	940 Mbps
Westelcom Network	Fiber	16.1%+	-- Mbps
TDS Business	Fiber	5.0%+	300 Mbps
Verizon	DSL Fiber	87%	15 Mbps

Summary of Internet Providers in Deferiet

13628

Provider	Type	Coverage	Speed
Charter Spectrum	Cable	100%	940 Mbps
King Street Wireless	Fixed Wireless	100%	1.0 Mbps
Viasat Internet (formerly Exede)	Satellite	100%	100 Mbps
HughesNet	Satellite	100%	25 Mbps
Spectrum Business	Cable	100%	940 Mbps

Verizon	DSL Fiber	89%	15 Mbps
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Summary of Internet Providers in Dexter 13634

Provider	Type	Coverage	Speed
TDS Telecom	DSL and Fiber	95.9%+	300 Mbps
Charter Spectrum	Cable	99.7%+	940 Mbps
King Street Wireless	Fixed Wireless	52.7%+	1.0 Mbps
Viasat Internet (formerly Exede)	Satellite	100%	100 Mbps
HughesNet	Satellite	100%	25 Mbps
Spectrum Business	Cable	100%	940 Mbps
TDS Business	Fiber	0.7%+	300 Mbps
Verizon	DSL Fiber	13.9%	15 Mbps

Summary of Internet Providers in Ellisburg 13636

Provider	Type	Coverage	Speed
Charter Spectrum	Cable	100%	940 Mbps
Frontier Communications	DSL	72.0%+	24 Mbps
King Street Wireless	Fixed Wireless	6.0%+	1.0 Mbps
Viasat Internet (formerly Exede)	Satellite	100%	100 Mbps
HughesNet	Satellite	100%	25 Mbps
Spectrum Business	Cable	100%	940 Mbps
Frontier Business	DSL	63.4%+	24 Mbps

Summary of Internet Providers in Evans Mills 13637

Provider	Type	Coverage	Speed
Charter Spectrum	Cable	99.6%+	940 Mbps
King Street Wireless	Fixed Wireless	98.2%+	1.0 Mbps
Viasat Internet (formerly Exede)	Satellite	100%	100 Mbps
HughesNet	Satellite	100%	25 Mbps
Spectrum Business	Cable and Fiber	100%	940 Mbps
Verizon	DSL Fiber	83.5%	15 Mbps

Summary of Internet Providers in Felts Mills 13638

Provider	Type	Coverage	Speed
Charter Spectrum	Cable	100%	940 Mbps
King Street Wireless	Fixed Wireless	100%	1.0 Mbps
Viasat Internet (formerly Exede)	Satellite	100%	100 Mbps
HughesNet	Satellite	100%	25 Mbps

Spectrum Business	Cable	100%	940 Mbps
Verizon	DSL Fiber	99.2%	15 Mbps

Summary of Internet Providers on Wellesley Island, (not including T.I. Park)

13640

Provider	Type	Coverage	Speed
Charter Spectrum	Cable	99.3%+	940 Mbps
Viasat Internet (formerly Exede)	Satellite	100%	100 Mbps
HughesNet	Satellite	100%	25 Mbps
Spectrum Business	Cable and Fiber	100%	940 Mbps
Verizon	DSL Fiber	78.6%	15 Mbps

Summary of Internet Providers in Fishers Landing

13641

Provider	Type	Coverage	Speed
Charter Spectrum	Cable	100%	940 Mbps
Viasat Internet (formerly Exede)	Satellite	100%	100 Mbps
HughesNet	Satellite	100%	25 Mbps
Spectrum Business	Cable	100%	940 Mbps
Verizon	DSL Fiber	100%	15 Mbps

Summary of Internet Providers in Great Bend

13643

Provider	Type	Coverage	Speed
Charter Spectrum	Cable	100%	940 Mbps
King Street Wireless	Fixed Wireless	100%	1.0 Mbps
Viasat Internet (formerly Exede)	Satellite	100%	100 Mbps
HughesNet	Satellite	100%	25 Mbps
Spectrum Business	Cable	100%	940 Mbps
Verizon	DSL Fiber	100%	15 Mbps

Summary of Internet Providers in Henderson

13650

Provider	Type	Coverage	Speed
Frontier Communications	DSL	95.8%+	24 Mbps
Charter Spectrum	Cable	54.2%+	940 Mbps
King Street Wireless	Fixed Wireless	17.0%+	1.0 Mbps
Viasat Internet (formerly Exede)	Satellite	100%	100 Mbps
HughesNet	Satellite	100%	25 Mbps
Frontier Business	DSL	100%	24 Mbps
Spectrum Business	Cable and Fiber	43.8%+	940 Mbps
Verizon Business	Copper	2.5%+	1.5 Mbps

Summary of Internet Providers in Henderson Harbor

13651

Provider	Type	Coverage	Speed
Charter Spectrum	Cable	100%	940 Mbps
Frontier Communications	DSL	89.0%+	24 Mbps
King Street Wireless	Fixed Wireless	71.7%+	1.0 Mbps
Viasat Internet (formerly Exede)	Satellite	100%	100 Mbps
HughesNet	Satellite	100%	25 Mbps
Spectrum Business	Cable	100%	940 Mbps
Frontier Business	DSL	98.3%+	24 Mbps

Summary of Internet Providers in LaFargeville

13656

Provider	Type	Coverage	Speed
Charter Spectrum	Cable	63.8%+	940 Mbps
Viasat Internet (formerly Exede)	Satellite	100%	100 Mbps
HughesNet	Satellite	100%	25 Mbps
Spectrum Business	Cable	100%	940 Mbps
Verizon	DSL Fiber	11.6%	15 Mbps

Summary of Internet Providers in Lorraine

13659

Provider	Type	Coverage	Speed
King Street Wireless	Fixed Wireless	100%	1.0 Mbps
Frontier Communications	DSL	42.3%+	12 Mbps
Charter Spectrum	Cable	38.1%+	940 Mbps
Viasat Internet (formerly Exede)	Satellite	100%	100 Mbps
HughesNet	Satellite	100%	25 Mbps
Frontier Business	DSL	100%	12 Mbps
Spectrum Business	Cable	21.2%+	940 Mbps

Summary of Internet Providers in Mannsville

13661

Provider	Type	Coverage	Speed
Frontier Communications	DSL	82.5%+	24 Mbps
Charter Spectrum	Cable	67.6%+	940 Mbps
King Street Wireless	Fixed Wireless	29.8%+	1.0 Mbps
Viasat Internet (formerly Exede)	Satellite	100%	100 Mbps
HughesNet	Satellite	100%	25 Mbps
Frontier Business	DSL	100%	24 Mbps
Spectrum Business	Cable	76.4%+	940 Mbps

Summary of Internet Providers in Natural Bridge

13665

Provider	Type	Coverage	Speed
King Street Wireless	Fixed Wireless	100%	1.0 Mbps
Charter Spectrum	Cable	95.2%+	940 Mbps
Frontier Communications	DSL	3.6%+	6 Mbps
HughesNet	Satellite	100%	25 Mbps
Viasat Internet (formerly Exede)	Satellite	100%	100 Mbps
Spectrum Business	Cable	70.8%+	940 Mbps
Frontier Business	DSL	5.6%+	6 Mbps

Summary of Internet Providers in Philadelphia

13673

Provider	Type	Coverage	Speed
King Street Wireless	Fixed Wireless	100%	1.0 Mbps
Charter Spectrum	Cable	95.9%+	940 Mbps
Viasat Internet (formerly Exede)	Satellite	100%	100 Mbps
HughesNet	Satellite	100%	25 Mbps
Spectrum Business	Cable	100%	940 Mbps
Verizon	DSL Fiber	94.0%	15 Mbps

Summary of Internet Providers in Pierrepont Manor

13674

Provider	Type	Coverage	Speed
Charter Spectrum	Cable	100%	940 Mbps
King Street Wireless	Fixed Wireless	100%	1.0 Mbps
Frontier Communications	DSL	92.9%+	24 Mbps
Viasat Internet (formerly Exede)	Satellite	100%	100 Mbps
HughesNet	Satellite	100%	25 Mbps
Spectrum Business	Cable	100%	940 Mbps
Frontier Business	DSL	88.1%+	24 Mbps

Summary of Internet Providers in Plessis

13675

Provider	Type	Coverage	Speed
Castle Cable TV	Fiber and Cable	65.6%+	50 Mbps
Viasat Internet (formerly Exede)	Satellite	100%	100 Mbps
HughesNet	Satellite	100%	25 Mbps
Castle Cable TV	Fiber	79.5%+	50 Mbps
Verizon	DSL Fiber	45.6%	15 Mbps

Summary of Internet Providers in Redwood

13679

Provider	Type	Coverage	Speed
Castle Cable TV	Fiber and Cable	58.3%+	100 Mbps
Charter Spectrum	Cable	1.2%+	940 Mbps
Viasat Internet (formerly Exede)	Satellite	100%	100 Mbps
HughesNet	Satellite	100%	25 Mbps
Castle Cable TV	Fiber	80.8%+	100 Mbps
Spectrum Business	Cable	11.7%+	940 Mbps
Verizon	DSL Fiber	68.5%	15 Mbps

Summary of Internet Providers in Rodman

13682

Provider	Type	Coverage	Speed
King Street Wireless	Fixed Wireless	96.2%+	1.0 Mbps
Frontier Communications	DSL	86.2%+	24 Mbps
Charter Spectrum	Cable	46.4%+	940 Mbps
Viasat Internet (formerly Exede)	Satellite	100%	100 Mbps
HughesNet	Satellite	100%	25 Mbps
Frontier Business	DSL	100%	24 Mbps
Spectrum Business	Cable	31.7%+	940 Mbps

Summary of Internet Providers in Sackets Harbor

13685

Provider	Type	Coverage	Speed
Charter Spectrum	Cable	97.1%+	940 Mbps
King Street Wireless	Fixed Wireless	77.8%+	1.0 Mbps
Frontier Communications	DSL	6.7%+	24 Mbps
TDS Telecom	DSL	4.6%+	5 Mbps
Viasat Internet (formerly Exede)	Satellite	100%	100 Mbps
HughesNet	Satellite	100%	25 Mbps
Spectrum Business	Cable	100%	940 Mbps
Frontier Business	DSL	34.9%+	24 Mbps
Verizon	DSL Fiber	93.1%	15 Mbps

Summary of Internet Providers in Theresa

13691

Provider	Type	Coverage	Speed
Charter Spectrum	Cable	70.3%+	940 Mbps
King Street Wireless	Fixed Wireless	35.6%+	1.0 Mbps
Castle Cable TV	Fiber and Cable	21.5%+	50 Mbps
Viasat Internet (formerly Exede)	Satellite	100%	100 Mbps

HughesNet	Satellite	100%	25 Mbps
Spectrum Business	Cable	100%	940 Mbps
Castle Cable TV	Fiber	32.6%+	50 Mbps
Verizon	DSL Fiber	10.2%	15 Mbps

Summary of Internet Providers in Thousand Island Park 13692

Provider	Type	Coverage	Speed
Charter Spectrum	Cable	100%	940 Mbps
Viasat Internet (formerly Exede)	Satellite	100%	100 Mbps
HughesNet	Satellite	100%	25 Mbps
Spectrum Business	Cable	100%	940 Mbps
Verizon	DSL Fiber	14.8%	15 Mbps

Summary of Internet Providers in Three Mile Bay 13693

Provider	Type	Coverage	Speed
TDS Telecom	DSL and Fiber	99.4%+	300 Mbps
Charter Spectrum	Cable	94.4%+	940 Mbps
Viasat Internet (formerly Exede)	Satellite	100%	100 Mbps
HughesNet	Satellite	100%	25 Mbps
Spectrum Business	Cable	100%	940 Mbps
TDS Business	Fiber	0.0%+	300 Mbps

Summary of Internet Providers in Hammond (out of County) 13646

Provider	Type	Coverage	Speed
Citizens Telephone of Hammond	DSL	70.8%+	5 Mbps
Castle Cable TV	Fiber	35.6%+	100 Mbps
Spectrum	Cable	24.3%+	940 Mbps
Viasat Internet (formerly Exede)	Satellite	100%	100 Mbps
HughesNet	Satellite	100%	25 Mbps
Citizens Telephone of Hammond	DSL	100%	5 Mbps
Castle Cable TV	Fiber	37.2%+	100 Mbps
Spectrum Business	Cable	19.5%+	940 Mbps
Uniti Fiber	Fiber	4.3%+	-- Mbps

5 County Telecommunications Summary

5.1 Summary of Findings:

Based on the information gathered in this study, Jefferson County is quite well served by incumbent telecommunications infrastructure throughout the County including both populated and the more rural areas of the County.

Many areas of the County lacking in broadband service are being addressed through New York State's New NY Broadband Program and the FCC's Rural Digital Opportunity Fund (RDOF).

Regrettably, the RDOF awarded areas may take upwards of six years to have infrastructure fully deployed. The remaining unserved and underserved areas of the County do have broadband infrastructure relatively nearby.

Businesses districts in the County have broadband access through incumbent local exchange carriers, cable companies and DANC. The investments in fiber infrastructure made by DANC also provide access to diverse fiber infrastructure.

The more rural areas of the County, including the Towns of Worth, Rodman and Lorraine as well as parts of Rutland, Champion and Alexandria have small areas requiring infrastructure. Otherwise, the County overall is well served. In this regard, Jefferson County stands out from other rural counties across the State and U.S.

Local Providers.

Four Incumbent Local Exchange Carriers (ILEC), two cable TV providers, and three Competitive Local Exchange Carriers (CLEC) were found to be operating in the County. Additionally, one alternative fiber provider, a fixed wireless provider, and four (4) cellular phone service providers were also identified.

Infrastructure.

From an infrastructure standpoint there are 20 Central Offices (including 3 outside the County) and numerous remote terminals providing service to residents and businesses. There are 24 FCC registered towers, with the majority of these located near developed areas along transportation corridors including Route 81 running north and south, and Route 12E and 126 to the east and north. There are no towers in the town of Worth and one in the very north west corner of Lorraine.

In addition to the central offices and wireless towers, there are miles of fiber infrastructure installed along the major transportation corridors linking towns, communities, and many remote areas.

Through recent state and federal grant funding since 2015, many unserved areas in Jefferson County are being addressed. More than \$17.4M, not including the RDOF awards, has been committed to expand broadband in Jefferson County. The state's New NY Broadband Grant program has provided funding for Castle Cable TV, Citizens, Frontier, TDS and Verizon to implement fiber to the home projects. These areas now have very high bandwidth service.

The remaining census blocks awarded to HughesNet include 2,884 homes. These blocks received grant funding for Hughes Network satellite service which is stated to have a bandwidth of at least 25/3 Mbps.

The federal RDOF areas will receive Gigabit service from Frontier and at least 25/3 Mbps service from SpaceX. However, with the RDOF program, the providers have up to 6 years to complete their buildouts.

Spectrum and Castle Cable TV

Broadband services provided by Spectrum and Castle Cable TV, were verified by identifying their fiber and coaxial cable routes. CATV based services appear to be readily available throughout the County. However CATV based service is not available in much of the town of Worth. Areas of Rodman and Lorraine likewise are lacking in CATV service.

CATV broadband gaps were discovered on several roads in the County. CATV coax and fiber may exist along a length of road, however, may not extend to allow service to all residents along the road. Examples include Nohle Road in Ellisburg, Deer Run Road and Fox Ridge Road in Watertown, and Vanalstyne Road in Depauville.

In addition, it was noted that many residents have very long driveways which could be cost prohibitive to the installation of service impacting broadband adoption.

As part of the Charter/Time Warner Cable merger, Spectrum is required by the State to expand its service to 145,000 unserved homes. We can deduce where these areas are by looking at where the State awarded grant funding as part of the New NY Broadband Grants. These grants were awarded in areas where Spectrum will not be expanding service.

Alternative Providers

Of the 4,612 homes in Jefferson County addressed through the New NY Broadband Grant program, 2,884 (62%) in Jefferson County were awarded to satellite provider HughesNet. The satellite award results in access to the minimum broadband service level of 25Mbps download and 3Mbps upload. In many of these areas of the County, satellite and DSL will be the only choice.

Westelcom is a CLEC type company with limited fiber network infrastructure in and around the Watertown area. According to the FCC 477 report they provide competitive services to businesses in Carthage, Clayton, and Watertown.

In addition, GTT and Windstream have limited areas where they provide copper-based services in the Watertown area. According to their FCC 477 reports both companies cover less than 2% of the area they are in. If they choose to connect to customers elsewhere, they will need to rely on the incumbent's infrastructure or build their own. This limits the competitive impact these companies have in other areas of the County.

DANC has open access fiber throughout Jefferson County, providing diverse routes to most of the municipalities in the County. DANC can be found on major routes including 11, 12, 12E, 26 and 411. This fiber allows CLECs and others that want to compete in the County a low-cost entry into the market. Since the DANC fiber is already in place, the competitive provider need only to build a lateral off the backbone to access customer locations to provide service.

Cellular Providers

The cellular providers in the County are AT&T Wireless, Verizon Wireless, T-Mobile, and Spectrum. All of the cellular companies have equipment on towers strategically placed in the County to provide mobile

wireless service to the maximum number of customers. A couple of the providers, AT&T and T-Mobile, claim to have 5G coverage in many areas of the County.

County Infrastructure

The County owns six towers for its communications radio system. Based on the FCC information, the County has registered all six towers in the following areas: Glen Park, Mannsville, Theresa, and Watertown with two located in Champion.

Broadband Availability and Adoption Tool (BAAT) Results

The broadband inventory data collected, corroborated the findings of the Broadband Availability and Adoption Tool Survey administered concurrently with the field Inventory. Mainly, the County is well served except for isolated areas of limited to no service. A common theme in the respondent data from the BAAT program is the importance of competitive choice for broadband service. Over 85% of the respondents indicated a choice in providers was important or very important. In many areas of the County, the residents have access to CATV based broadband. However, the competitive service available is either DSL which provides a fraction of the speed or Satellite based service which is impacted by line of site issues caused by heavy rain or snow. In the open-ended responses, many complained about service quality and the inability to choose another broadband provider.

The next two pages show Figures 20 and 21. These figures represent data collected from the BAAT survey program implemented in Jefferson County in February, March, and April of 2021.

Figure 20 shows a breakdown of the type of service subscribed. CATV based broadband is the most prevalent across the County. However, pockets of satellite, DSL, and Dialup are seen in Antwerp, Theresa, Alexandria, Worth Lorraine, Rutland, and Champion.

Figure 21 shows where respondents have indicated they cannot purchase the speed they need. Again, the results show areas in Antwerp, Theresa, Alexandria, Worth, Lorraine, Rutland, and Champion.

JEFFERSON COUNTY, NY

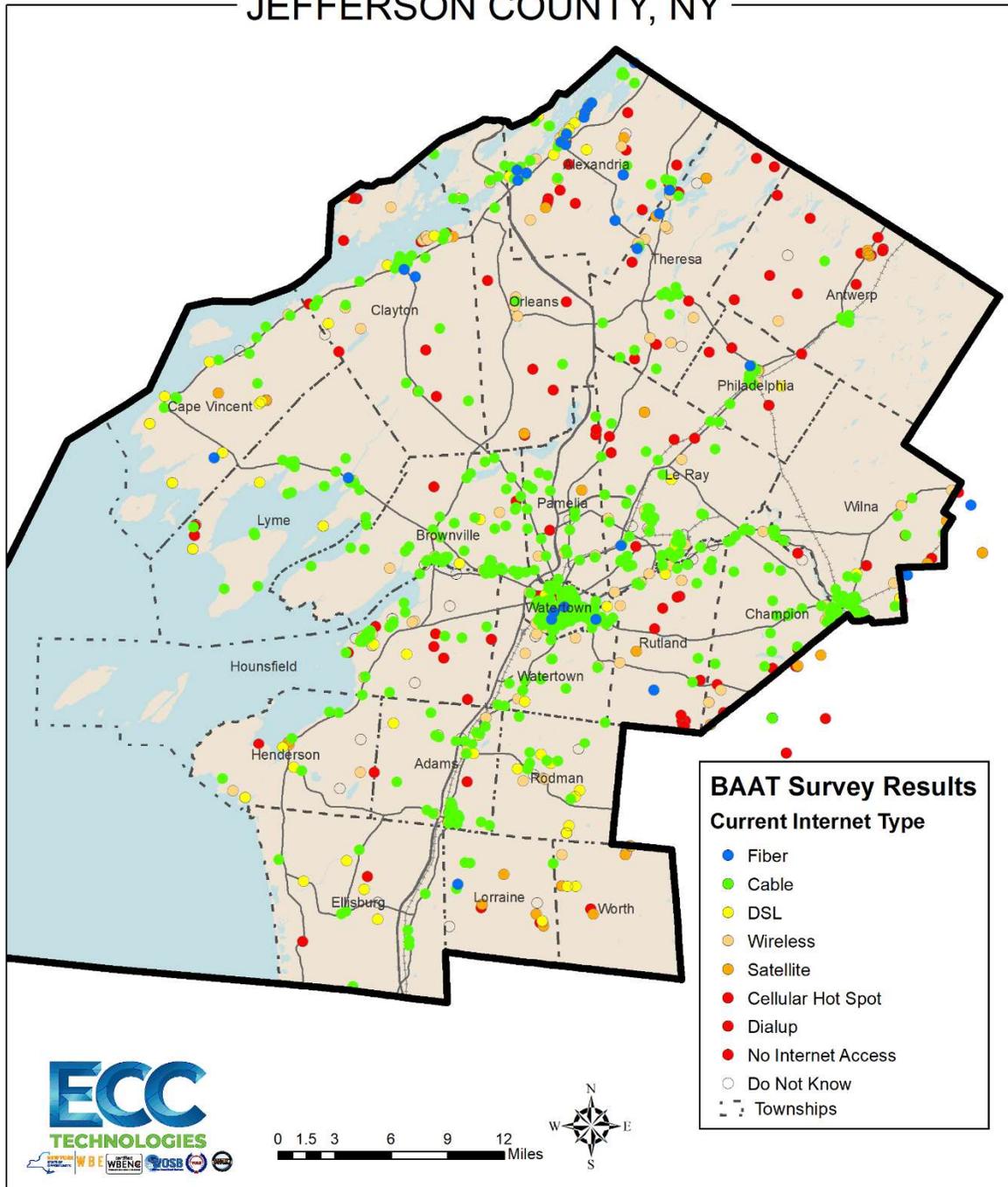


FIGURE 20: TYPE OF INTERNET SUBSCRIBED

JEFFERSON COUNTY, NY

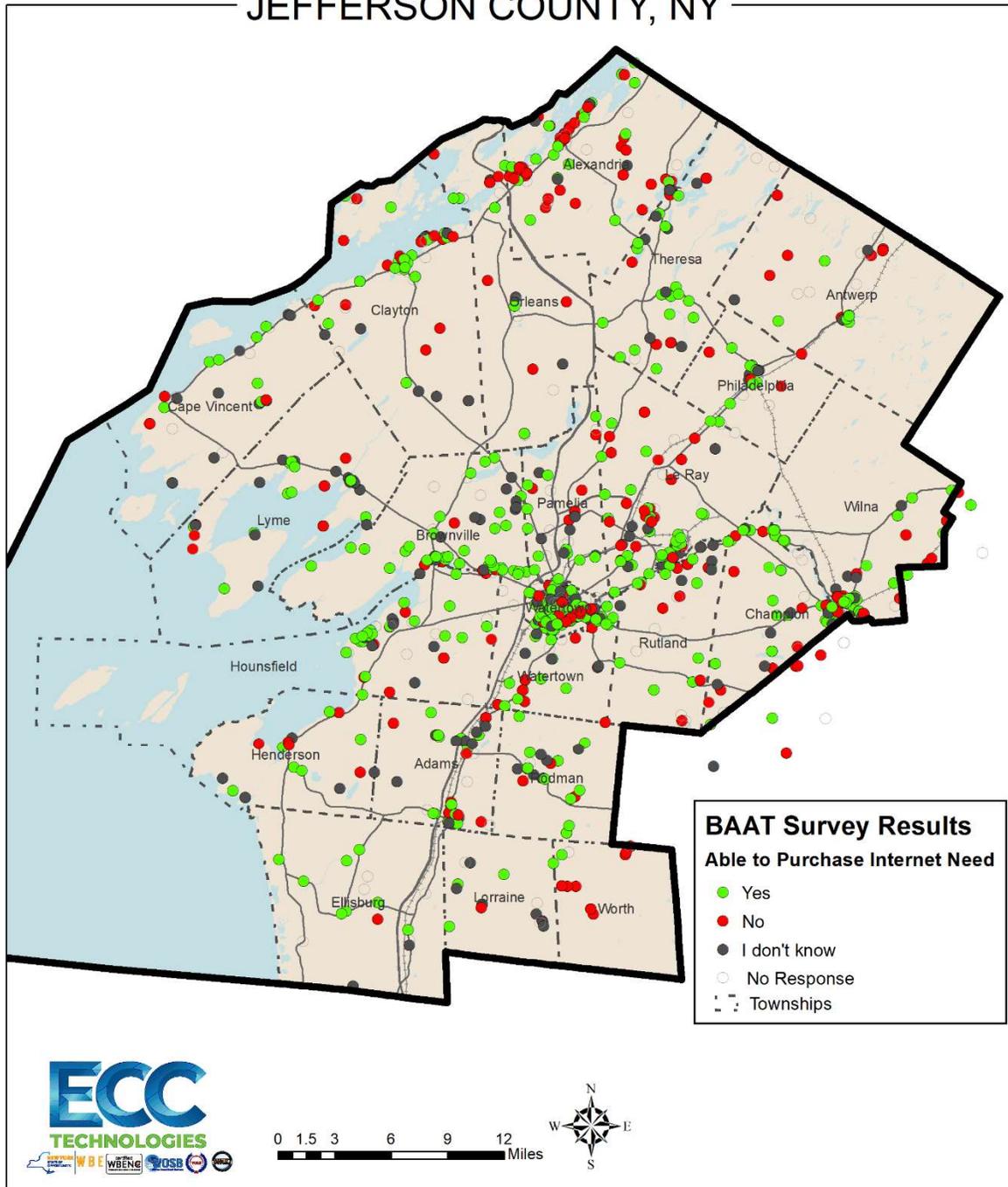


FIGURE 21: ABLE TO PURCHASE THE NEEDED SPEED

6. Next Steps:

6.1 Summary of Actions

The study has shown that there are relatively small areas within the County that do not have access to acceptable broadband services. Like other communities, the County has the option to request that providers implement their own programs via RDOF or other means. Due to the RDOF rules, Carriers have up to six-years to complete their construction. In addition, some roads in the County have CATV based broadband service but with significant breaks in the service area. Figure 22 below, shows an example of the breaks in CATV Broadband coverage in the County. A section of Route 2 with portions of Williams Road and Hunter Road in the Town of Alexandria represents nearly 20 homes that do not have access to sufficient broadband. The Cable TV operator or Incumbent phone company could be approached to extend service to these areas.



FIGURE 22: EXAMPLE OF BREAKS IN CATV BROADBAND COVERAGE

It has been noted there are limited choices for residential subscribers. In some areas of the County, residential customers have or will have a choice between CATV based broadband service and Fiber to the Home (FTTH) services. Efforts from the New NY Broadband Grants and RDOF will result in the expansion of FTTH in Cape Vincent, Lyme, and Brownville through TDS Telecom. The Towns of Clayton, Orleans, and Antwerp will have FTTH from Verizon. The towns of Alexandria and Theresa will be served via FTTH services from Verizon, Citizens of Hammond, and next generation satellite service from SpaceX. Worth will have FTTH from Frontier.

The County has the option to play a lead role in developing solutions to meet the needs and requirements of the County as a whole.

ECC assumes with respect to these solutions the County does not want to be a service provider, providing broadband service to the home, and that the Development Authority of the North Country (DANC) also does not want to be a to-the-home broadband provider.

Both the County and DANC would play a supporting role as needed and the optimum solution would be to create programs that incentivize providers to expand services to the unserved areas of the County.

In taking a leadership role the County has several options in which to accomplish its goals of 100% broadband availability. We believe and recommend that any options would involve a partnership of the County and service providers working together. DANC as a major infrastructure owner in the County could also be brought to the table to provide access to critical fiber infrastructure which will be needed.

Option 1.

The County can self-fund the build-out of infrastructure, fiber or wireless, needed to provide the unserved residents with broadband. Once built, the County would partner with a reliable established broadband partner that would operate it.

This option would have a significant level of expense and could represent a direct burden to the taxpayers. It does, however, allow for a shared revenue relationship which would allow the County to recover some costs.

Aside from the cost burden of this type of program it is likely that many of the currently served residents may also want this service delivered to them. This would initially create an uncertain financial model, be difficult to manage and require the buildout to areas already served.

Several communities across the U.S., mostly cities and villages, are implementing this model. It is widely known as Municipal Broadband and generally is a last resort in rural communities. ECC does not recommend this approach, but in the absence of any other options, this could be considered.

Option 2.

The County can consider creating a partnership with broadband service providers to solicit grant programs through the County, State or Federal programs to pay for infrastructure needed to expand broadband to unserved areas.

This program, which ECC recommends, would enable the County to play a leadership role and share the costs with public, private and grant funding sources. The information developed as part of this Broadband study will serve as justification for the County and its partners to solicit the needed grant funds.

Grant funds historically have been available via the FCC. The County could pursue broadband grant opportunities for rural area broadband access, such as those periodically provided by the USDA, NTIA, New York State, Public Safety, the Northern Border Regional Commission, private foundations, and others.

Locally in New York, this type of program has been implemented by several counties including Yates, which secured grant funds via the USDA ReConnect program and Madison County, which has submitted a request to the USDA ReConnect program as well. Both Yates and Madison Counties used ECC's inventory and BAAT programs as the foundations to support their grant requests. However, the Yates and Madison County programs addressed significant areas of unserved and underserved households in their communities. Jefferson County does not have as extensive unserved and underserved population.

A summary of the Madison County program is as follows,

Madison County, NY.

The County identified areas that needed broadband expansion and investment by conducting a broadband inventory and BAAT campaign like that done in Jefferson County. The County leveraged their study information to create a partnership with and team with Empire Access to apply for a USDA ReConnect grant to offer a fiber-to-the-premise solution.

Their program will offer high speed data, TV, and phone services to the unserved and underserved areas. The solution would make fiber based broadband available to 970 homes that currently do not have access to adequate broadband in the County.

The total project is estimated to require over \$16M. The County will contribute \$3.4M, the USDA Grant would contribute \$10.2M and Empire Access will contribute \$2.5M.

The County will own the infrastructure. Empire will use the infrastructure to offer services, invoice and service clients and maintain the network. The application is still under review by the USDA for approval.

6.2 Analysis

After evaluating the infrastructure within the County and understanding the grant awards that have been made with the plans to expand broadband within the County, we can clearly begin to see areas of the County that need additional help in the expansion of broadband availability.

Selecting the census blocks awarded to HughesNet through the New NY Broadband Grant program helps to narrow the set of census blocks which can be prioritized and targeted for funding of new broadband infrastructure. Further elimination of RDOF awarded census blocks leaves us with Figure 23 Potential Grant Eligible Areas. The blocks in green on the map show the resultant of the HughesNet awarded blocks minus the RDOF awarded blocks representing the initial areas of focus for expanding broadband.

By overlaying the infrastructure data collected during the field inventory onto the potential grant eligible areas, a clearer picture and understanding of nearby infrastructure can be realized. Figure 24: Potential Grant Eligible Areas with Infrastructure Overlay provides us with that view.

Figure 25: Potential Grant Eligible Areas by Household Density assists in prioritizing areas of focus to maximize the infrastructure investment to services the greatest number of homes.

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JEFFERSON COUNTY, NY - Potential Grant Eligible Areas

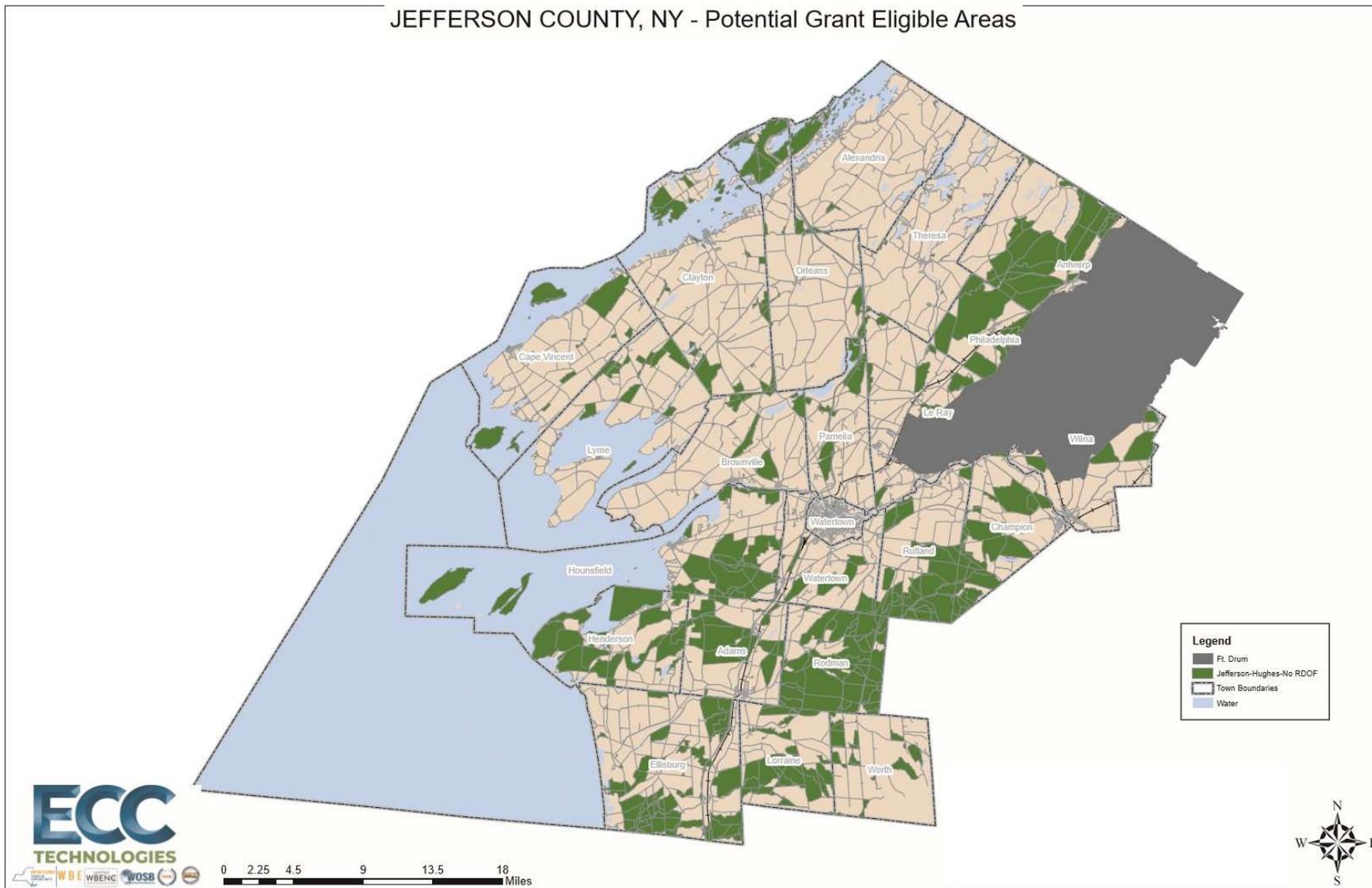


FIGURE 23: POTENTIAL FEDERAL GRANT ELIGIBLE AREAS

JEFFERSON COUNTY, NY - Potential Grant Eligible Areas

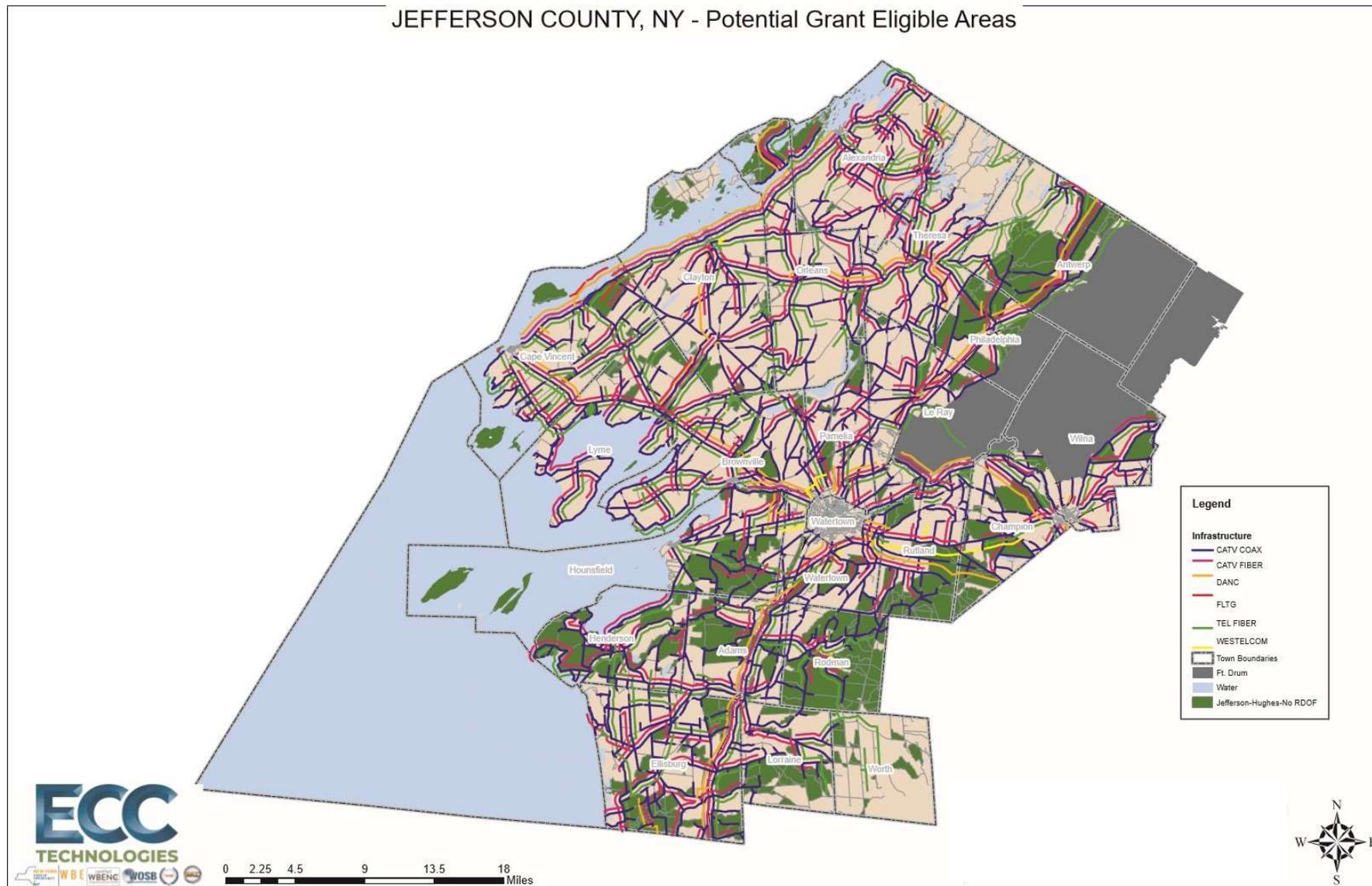


FIGURE 24: POTENTIAL GRANT ELIGIBLE AREAS WITH INFRASTRUCTURE OVERLAY

JEFFERSON COUNTY, NY - Potential Grant Eligible Areas

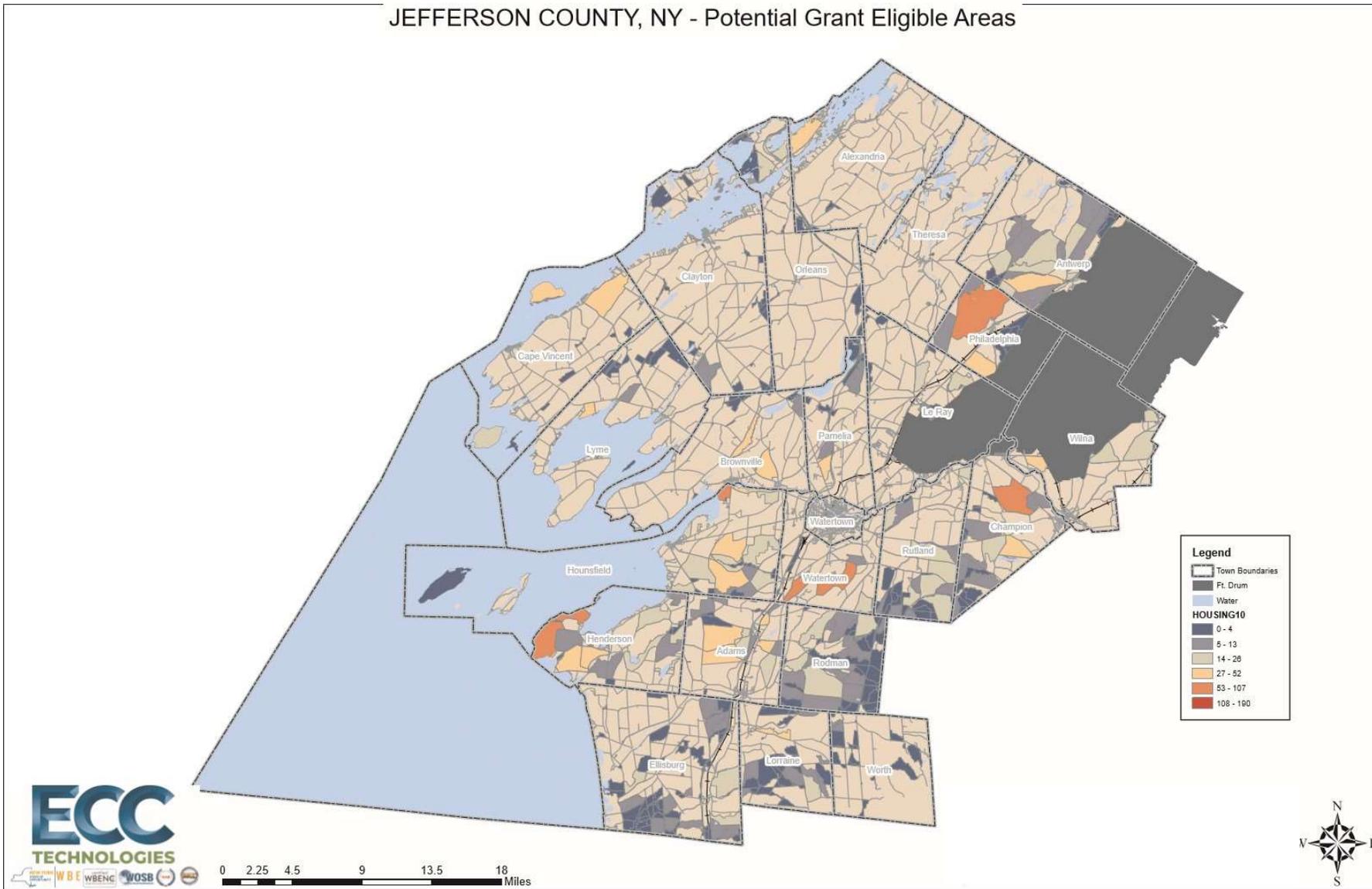


FIGURE 25: POTENTIAL GRANT ELIGIBLE AREAS BY HOUSEHOLD DENSITY

6.3 Target Areas

Based upon Figure 26, 27, 28 and 29 we have defined four potential areas to target for broadband expansion and possible grant funding. The areas have been defined into the following geographic areas:

1. **Champion/Rutland** – This area consists of 67 households served by basic telephone and HughesNet Service. This area has DANC owned fiber infrastructure along Route 12 through the middle of the area with CATV fiber branches on the outside edges.

This could be an ideal area for DANC or Spectrum to leverage their fiber infrastructure to provide either Coaxial or Fiber based broadband services. Another option could be to deploy a fiber fed fixed wireless solution for the area. This area could also prove to be ideal for a Northern Border Regional Commission Grant as the backbone infrastructure is nearby.

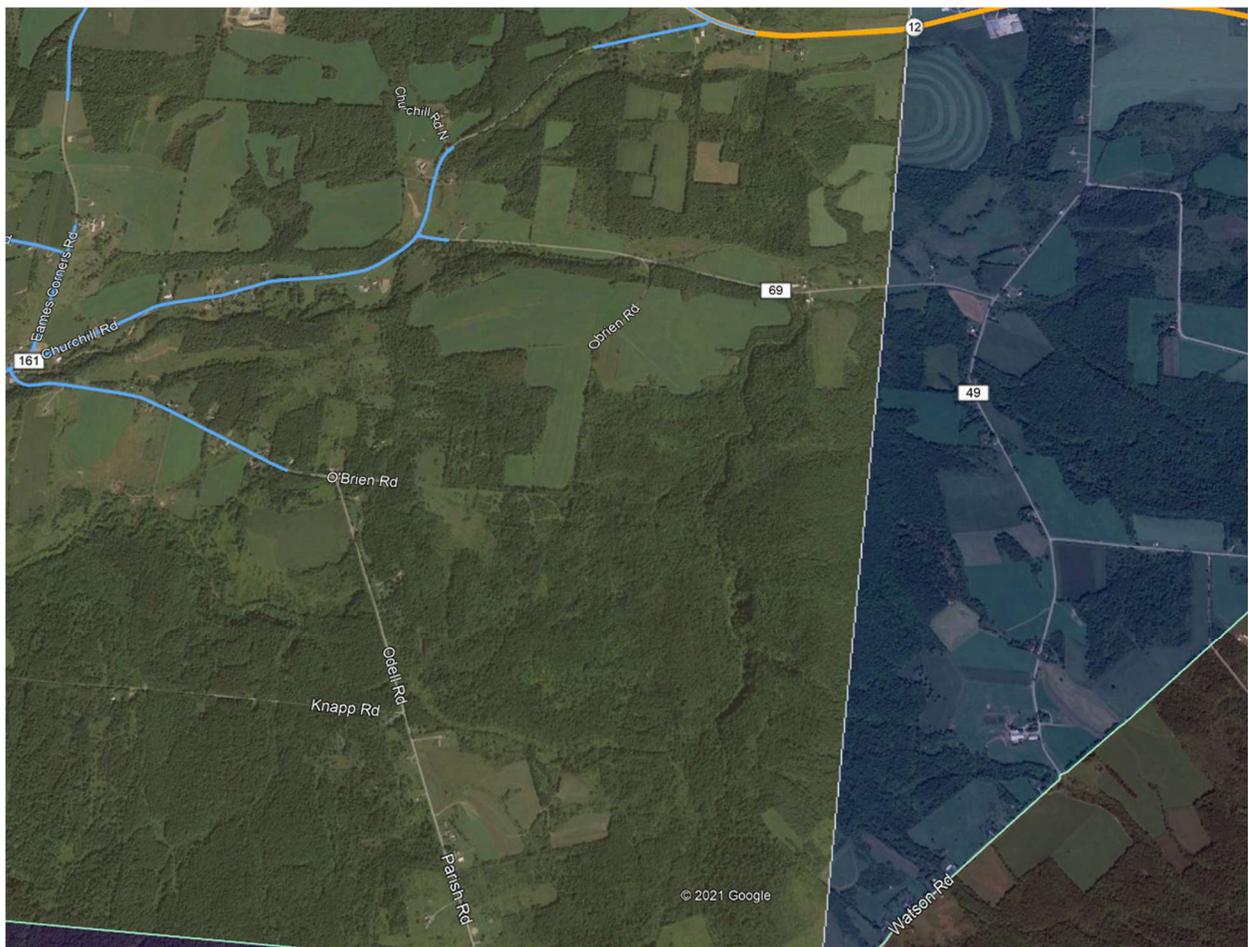


FIGURE 26: CHAMPION/RUTLAND

2. **Alexandria** - 41 Households near Clear and Mud Lake in the Town of Alexandria appear to be lacking in broadband service. In addition, as was stated earlier, a section of Route 2 with portions of Williams Road and Hunter Road in the Town of Alexandria represents nearly 20 additional homes that do not have access to sufficient broadband. The Cable TV operator or Incumbent phone company could be approached to extend service to these areas.

CATV and Telephone Fiber are in the area. The County could negotiate with Spectrum or Verizon to extend broadband services to the homes in this area. DANC fiber is not very near this section and a build would be costly.



FIGURE 27: ALEXANDRIA

3. **Rodman (South East)** – The southeast corner of the town has 27 households that are underserved. Spectrum has service on the roads but stop short of these homes.

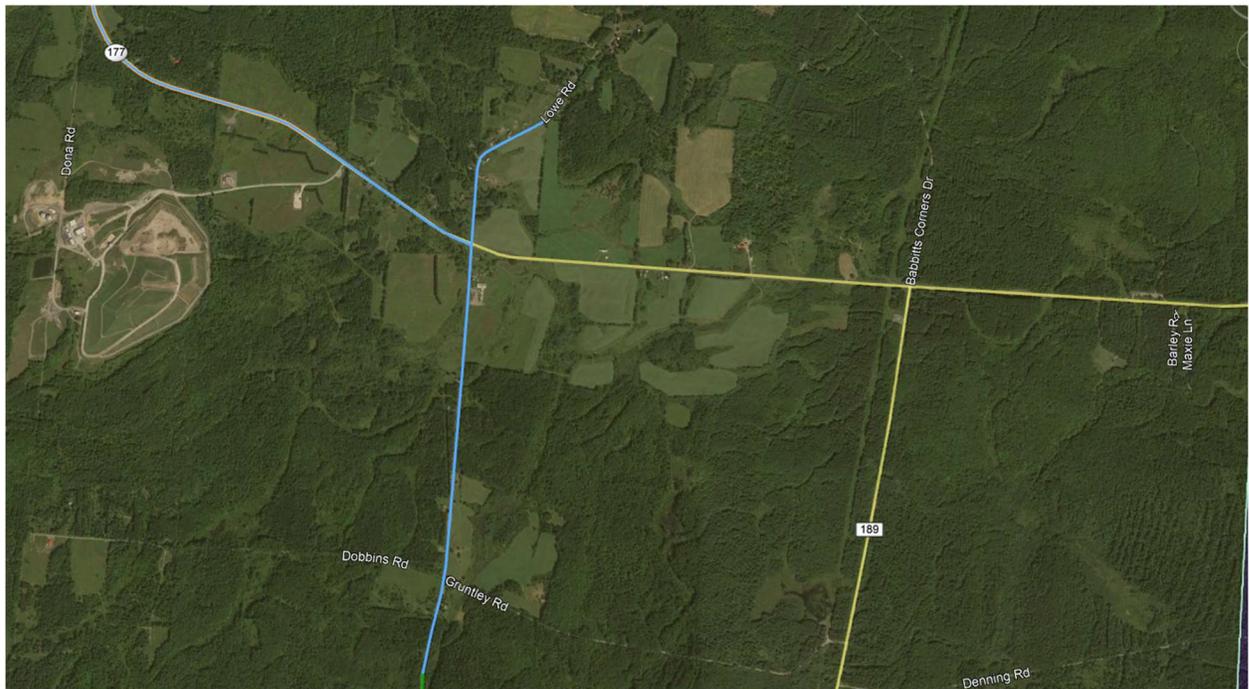


FIGURE 28: RODMAN

4. **Hounsfeld** – To the northeast of Sackets Harbor is an area with nearly 63 homes with CATV infrastructure very close by. Again, this is another area that could be negotiated with Spectrum to expand their service.

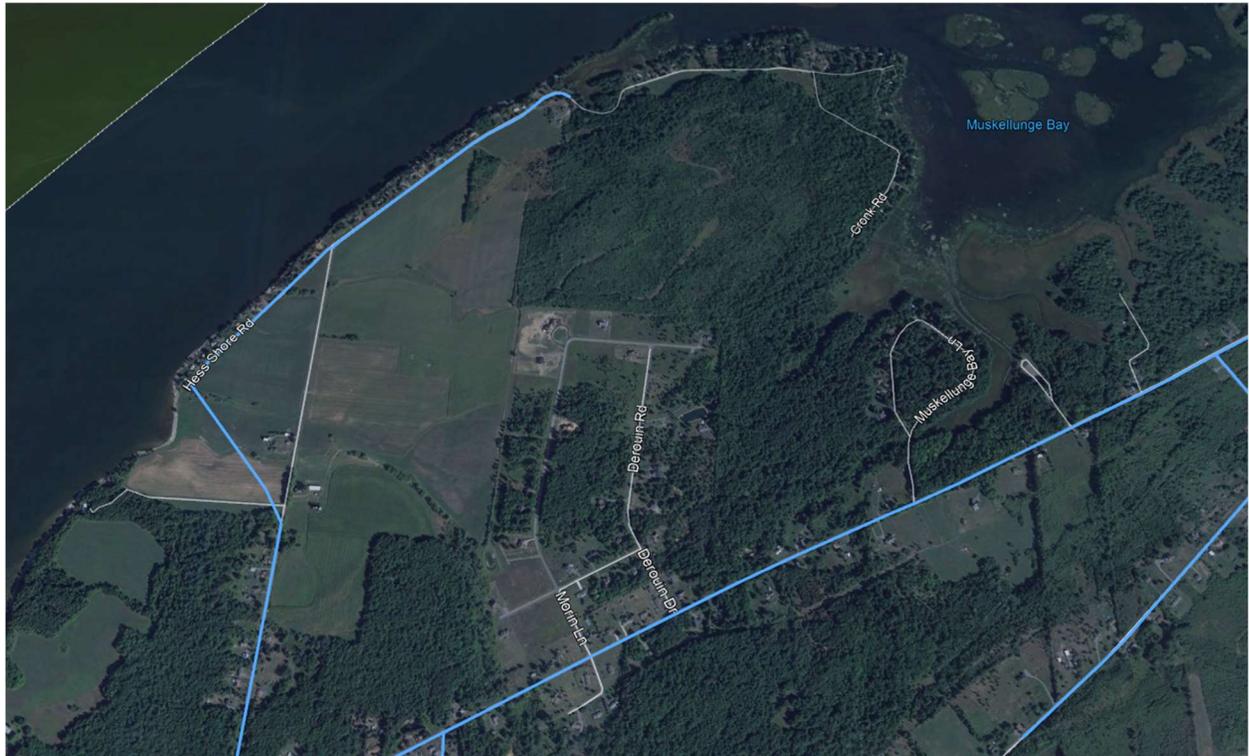


FIGURE 29: HOUNSFELD

Appendix

Appendix A. Provider Service, Speeds and Costs

Spectrum Residential



176 Duffy St Watertown, NY 13601

Internet Get high-speed Internet with no data caps	\$49 ^{99/mo} for 12 mos. Pricing Info
Speeds up to 100 Mbps	CHOOSE
Read more	
Internet Ultra Go faster and turbo charge all your devices with Internet Ultra	\$69 ^{99/mo} for 12 mos. Pricing Info
Speeds up to 400 Mbps	CHOOSE
Read more	
Internet Gig For the ultimate experience choose Internet Gig - our fastest speed available	\$109 ^{99/mo} for 12 mos. Pricing Info
Speeds up to 940 Mbps	CHOOSE
Read more	

Spectrum Business

200 Mbps INTERNET

\$64⁹⁹/mo
for 12 mos*

No contracts. No hidden fees.

200 Mbps INTERNET + VOICE

\$69⁹⁸/mo
for 12 mos
when bundled*

No contracts. No hidden fees. No
added voice taxes.

200 Mbps INTERNET + VOICE
+ TV ESSENTIALS

\$89⁹⁷/mo
for 12 mos
when bundled***

No contracts. No hidden fees. No
added voice taxes.

Bonus Gift: Get Apple TV 4K on us**
Offer not applicable to Bars and Restaurants

Frontier



8 Wright St Adams, NY 13605

Internet Only

Internet

- Speed up to: **↓9 Mbps** ⓘ
- Connection: **DSL**
- Setup: \$85.00 (Includes activation fee.)
- Data Caps: **No Caps**
- Price: **\$37.99/mo**

Internet Only

Internet

- Speed up to: **↓25 Mbps** ⓘ
- Connection: **DSL**
- Setup: \$85.00 (Includes activation fee.)
- Data Caps: **No Caps**
- Price: **\$44.99/mo**

1 year promo rate.

Internet Only

Internet

- Speed up to: **↓50 Mbps and ↑50 Mbps** ⓘ
- Connection: **Fiber**
- Setup: \$85 Activation fee (\$49 for NY)
- Data Caps: **No Caps**
- Price: **\$49.99/mo**

1 year promo rate. Regular rate is \$59.99.

Internet Only

Internet

- Speed up to: **↓115 Mbps** ⓘ
- Connection: **DSL**
- Setup: \$85.00 (Includes activation fee.)
- Data Caps: **No Caps**
- Price: **\$54.99/mo**

1 year promo rate.

Internet Only

Internet

- Speed up to: **↓500 Mbps and ↑500 Mbps** ⓘ
- Connection: **Fiber**
- Setup: \$85 Activation fee (\$49 for NY)
- Data Caps: **No Caps**
- Price: **\$59.99/mo**

1 year promo rate. Regular rate is \$69.99.

Internet Only

Internet

- Speed up to: **↓940 Mbps and ↑880 Mbps** ⓘ
- Connection: **Fiber**
- Setup: \$85 Activation fee (\$49 for NY)
- Data Caps: **No Caps**
- Price: **\$79.99/mo**

1 year promo rate. Regular rate is \$89.99.

Frontier Internet for Business

Speeds up to 115Mbps

- ✓ Consistent monthly pricing.
- ✓ Zero data caps.* No overage charges.
- ✓ Bundled options for a variety of Internet packages for best value.
- ✓ Static IP blocks also available.

\$49⁹⁹/mo*

Wi-Fi router & unlimited monthly data included*

Citizens of Hammond

Monthly Service Charges:

Internet Services

1mb/256k	\$29.95
5mb/2mb	\$42.95
25mb/4mb	\$59.95
50mb/4mb	\$129.95
100mb/25mb	\$179.95

Cable Services

Lifeline Pak	\$52.50
Basic Value Pak	\$83.25
Extended Basic Pak	\$103.00

Premium Channels

HBO-(4 channels)	\$20.50
Starz/Encore (10 channels)	\$11.25
Cinemax (3 channels)	\$11.25

Bundled Internet & Cable TV Packages

Ext Basic Pak Cable/1/256 Internet-	\$107.95
Ext Basic Pak Cable/5/2 Internet-	\$120.95
Ext Basic Pak Cable/25/4 Internet-	\$137.95
Ext Basic Pak Cable/50/4 Internet-	\$207.95
Ext Basic Pak Cable/100/25 Internet-	\$257.95

Cable Pak's include 1 Standard Definition set top box at no additional charge.

****Business rates may be slightly higher.****

****Telephone Service is not required for internet/cable TV services.**

Monthly Service Charges:

SAVE ME 300 PLAN

(Includes Phone & Internet) Unlimited local calling, call id, call waiting, call forwarding, 300 minutes of long distance and internet.

1/256K	\$65.94
5/2mb	\$78.94
25/4mb	\$95.94
50/4mb	\$165.94
100/25mb	\$215.94

SAVE ME 300 PLUS

(Includes Phone & Internet) Unlimited local calling, call id, call waiting, call forwarding, 300 minutes of long distance internet & Extended Basic Pak Cable TV

1/256K	\$148.94
5/2mb	\$161.94
25/4mb	\$178.94
50/4mb	\$248.94
100/25mb	\$298.94

SAVE ME 600 PLAN

(Includes Phone & Internet) Unlimited local calling, call id, call waiting, call forwarding, 600 minutes of long distance and internet.

1/256K	\$89.94
5/2mb	\$102.94
25/4mb	\$119.94
50/4mb	\$189.94
100/25mb	\$239.94

**** Pricing effective 04/01/2020 and is subject to change.****

Monthly Service Charges:

SAVE ME 600 PLUS

(Includes Phone & Internet) Unlimited local calling, call id, call waiting, call forwarding, 600 minutes of long distance, internet & Extended Basic Pak Cable TV

1/256K	\$172.94
5/2mb	\$185.94
25/4mb	\$202.94
50/4mb	\$272.94
100/25mb	\$322.94

INSTALLATION FEES

Phone-	\$19.83
Internet-	\$49.00
Cable (up to 2 TV's)	\$99.99
Cable&Internet-(up to 2 TV's)	\$99.99
Add'l Set Top Box	\$52.95 ea
Cable pack's include one standard set top box at no additional charge or one HD box for \$7.95	
Installation includes the install of up to 2 set top boxes.	

EQUIPMENT FEES-Monthly Charge

Standard Definition Set Top Box	\$5.95
HD Set Top Box-	\$7.95
HD/DVR Set Top Box	\$12.95

WIRELESS ROUTER

Wireless Router	\$89.99
Free Installation when installed during initial service installation.	
Anytime after initial install-	\$75.00
Program Wireless Router-	\$30.00

Seasonal Service Dates: May 1-Nov. 1 or Dec 1,

Seasonal customers who subscribe to cable and or internet will be charged a monthly fee of \$5.00 for each service for the six months the service is suspended. The six month fee will be billed in November or December, according to your chosen suspension date.

Citizens is working on expanding our FTTH (Fiber to the Home).
Not all areas have FTTH, please contact the business office to verify location.

Verizon Residential



176 Duffy St Watertown, NY 13601

Residential

The available DSL Internet and home phone bundle is \$74.99 + taxes (Download Speed 15 Mbps)

Verizon Business

Download speeds (up to)	10 Mbps	25 Mbps	50 Mbps
Unlimited data	22 GB of premium network access ○	22 GB of premium network access ○	22 GB of premium network access ○
Price	\$69/mo Plus taxes, fees and equipment charges ○	\$99/mo Plus taxes, fees and equipment charges ○	\$199/mo Plus taxes, fees and equipment charges ○

TDS Telecom



11887 State Route 12E Chaumont, NY 13622

1 High-Speed Internet

Internet Options

Please select a High-Speed Internet Plan.



Turbo Internet

\$62.95/mo.

Download Range: 6Mbps to 15Mbps; Max Upload: 768Kbps. [More Details.](#)



Express Internet

\$57.95/mo.

Download Range: 2Mbps to 5Mbps; Max Upload: 512Kbps. [More Details.](#)

Selection Summary

High-Speed Internet

Modem **\$10.00/mo.**

Terms & Installation

Professional Installation **\$49.95**

Professional Installation Full Waiver **(\$49.95)**

One-time costs **\$49.95**

One-time credits **\$49.95**

Monthly Charges **\$10.00**
Plus Taxes and Fees

Add to Cart



Appendix B USDA ReConnect

Appendix B USDA ReConnect

The scope of the ReConnect grant is extensive, in depth and complex. ECC will be happy to work closely with and support DANC and the County on the development of any grant application.

Below, however, is an example of the information required from the Round 2 ReConnect Grant application.

USDA Round 2 ReConnect Application Tasks:

SECTION A - GENERAL INFO ON THE APPLICANT AND THE PROJECT

- General Info on the Applicant
- A description of the project (which will be made public)
- The estimated dollar amount of the Funding Request

SECTION B - AN EXECUTIVE SUMMARY OF THE PROPOSED PROJECT

- Description of Existing Operation
- Key Management
- Description of Workforce
- Interaction between Parent and Affiliate or Subsidiary
- Detailed description of the proposed Project

SECTION C - DESCRIPTION OF THE PROPOSED FUNDED SERVICE AREA

- Description of the Proposed Funded Service Area including Homes Passed

SECTION D - SUBSCRIBER PROJECTIONS

- No. of Subscribers for BB, Video and Voice -- and other services
- Description of the Proposed Service and the Pricing Plan
- Explanation of Service Affordability

SECTION E - MAP OF THE PROPOSED FUNDED SERVICE AREA (PFSA)

- Create Map from RUS Mapping Tool -- reconnect.usda.gov
- Identify and Prove Areas without BB and non-funded service areas of the applicant*
 - Assessment of Current BB in Project Area
 - Description of data source or methodology to capture data
 - Unserved Areas - Identify Eligible Areas
 - Map of Unserved area
 - BAAT data
 - Census Block Overlay

*Donut Holes are allowed in PFSA and MM Fiber can route through noneligible area

SECTION F - DESCRIPTION OF ADVERTISED PRICES BY COMPETITORS IN THE SAME AREA

- Description of Advertised Prices by Competitors in the Same Area
- Description of Existing Services and Speeds

SECTION G - NETWORK DESIGN

- Description of Proposed Technology Used
 - Narrative explaining design of deployment
 - Explanation of current networks and equipment to be leveraged
 - Explanation of tying the number of users - for new service
 - Fixed Wireless providers explain frequency to be used and other info

- Explanation of Scalability
- Demonstrate that all premises can be served
- A Network Diagram
- Buildout Timeline and Milestone
- Network Information Certified by Professional Engineer
- Certify 100Mbps both ways? Y or N
- List all Required Licenses and Regulatory approvals needed for project
- List how much Applicant will rely on contractors and vendors to deploy network

SECTION H - RESUMES, READINESS AND ORG CHART

- Resumes of Key Management
- Description of org's readiness to manage BB network
- Org Chart showing all Parent orgs and subsidiaries and affiliates

SECTION I - LEGAL OPINION (Client legal team provides)

- Ability to enter Award Documents
- Describe all pending litigation matters
- Pledge Security
- Ability to Provide BB under State Law

SECTION J - INFRASTRUCTURE COSTS

- Summarize and itemize Budget of infrastructure costs
 - Narrative
 - Budget Detail
- Describe Ratio of Loans to Grant, and any other outside funding

SECTION K - WORKING CAPITAL

- Description of Working Capital requirements and Source of Funds

SECTION L - HISTORICAL FINANCIAL STATEMENTS

- Last 4 years or since startup --including income statement, balance sheet, cash flow

SECTION M - AUDITED FINANCIAL STATEMENT

- 2 Previous Years of Operation from Each of the Partners

SECTION N - PROJECT PRO FORMA -- PER US GAAP ACCOUNTING PER GOV'T WEBSITE

- As per <http://www.rd.usda.gov/files/accounting/guidance10.PDF>
- Subscriber estimates, annual financial projections with balance sheets, income statements, and cash flow, depreciation schedule
 - Narrative
 - Budget Detail
 - Financial Model
 - Definition
 - Creation
 - Review
- Committed Resources of Capital Funding and Include Bridge Year

SECTION O - RUS APPLICATION SYSTEM ATTACHMENTS

- Download forms below from USDA website and fill out the ones that apply
 - Closing Instructions
 - Legal Opinion
 - Mortgage-Co-Lender

- Mortgage-Existing Borrower
- Mortgage- New Borrower
- ReConnect Agreement – Loan/Grant and Security Agreement
- Farm or Business Pre-Subscription Form
- Network Design Certification

SECTION P - SCORING SHEET

- Create Scoring Sheet set forth in FOA

SECTION Q - OBLIGATIONS

- List of Obligations, security agreements, service agreements etc.

SECTION R - ENVIRONMENTAL INFORMATION

- Required to certify construction meets the NEPA and Endangered Species
- Use Online system and after the fact info

SECTION S - CERTIFY AGREEMENTS TO INVESTORS

- Certification that agreements or obligations with investors do not breach government draft award

SECTION T - TRIBAL LAND

- Certification from Tribal Official that they support the project
- Include land that will be part of project, owned or held in trust, ID landowners

SECTION U - OTHER MATERIAL REQUESTED IN THE ONLINE APPLICATION SYSTEM

ECC will be happy to work closely with DANC and the County to project manage, develop, and submit grant applications. Once it is determined grant application(s) will be required, ECC develops a detailed project plan with action items for the DANC and the County. ECC staff, DANC and County representatives compile data and responses to be entered into the respective grant portal.

Appendix C Glossary

Appendix C – Glossary

BACKBONE. Backbone, in the context of networking, refers to the highest speed and widest bandwidth point of a communications circuit or path. In most cases, all information central to the users is connected to the backbone (e.g., shared databases or servers).

BANDWIDTH. Bandwidth is the amount of data that can be carried by a circuit between two points of a network. Bandwidth is typically measured in Hertz (cycles per second), bits per second or kilobits per second (shortened to Bps or Kbps). The top speed of today's modems is 56,000Bps or 56Kbps.

The wire connecting a private home to the telephone company carries up to 128,000Bps while one strand of fiber optics can carry 20,000,000,000 (20 Gigabits). A 20Gbps fiber optic strand can interconnect 357,000 telephone calls.

8 bits equal one byte of data – a byte is generally the same as one character – for example, the letter “a.”

BROADBAND. Broadband is a descriptive term for evolving digital technologies that provide consumers a signal switched facility offering integrated access to voice, high-speed data service, video-demand services, and interactive delivery services.

CATV (Cable Television System). A broadband communications system capable of delivering multiple channels of programming from a set of centralized satellite and off-air antennae, generally by coaxial cable, to a community. Many cable-television designs integrate fiber-optic and microwave links.

A service through which subscribers pay to have local television stations and additional programs brought into their homes from an antenna via a coaxial cable.

CENTRAL OFFICE (CO). A CO is a major equipment center designed to serve the communications traffic of a specific geographic area. CO coordinates are used in mileage calculations for local and interexchange service rates. A Central Office usually has less than 100,000 telephone lines within its wire boundary. COs are usually owned and operated by LECs.

CLEC (Competitive Local Exchange Carrier). A CLEC is a telephone company that competes with the incumbent telephone company. The formation of these organizations is a direct result of the Telecommunications Act of 1996.

COAXIAL CABLE. A type of cable used for broadband data and cable systems. Also known as “coax.” Coaxial cable is composed of an insulated central conducting wire wrapped in another cylindrical conducting wire. It is usually wrapped in another layer and an outer protective layer and has the capacity to carry great quantities of information.

DARK FIBER. Dark Fiber is fiber optic cable, typically between end user locations, that the end user owns, lights, and operates.

DSL (Digital Subscriber Line). DSL is technology that allows for the simultaneous transmission of voice and Internet data over a single telephone line. Central Offices that have DSL technology can support DSL services to customers within approximately 18,000 feet of the Central Office.

DSL is delivered either asymmetrically (ADSL) or symmetrically (SDSL). ADSL lines have download transmission rates higher than upload rates and are typical for residential or business users that receive

much more Internet content than they send. SDSL are for businesses that generate and receive large amounts of Internet data.

DOWNLOAD SPEED. The rate at which data is transferred from the Internet to the user's computer is termed download speed. This speed is typically stated in Megabits (1,000,000 bits) per second or Gigabits (1,000 Megabits) per second.

FIBER OPTICS. The technology of guiding and projecting light for use as a communications medium. Hair-thin glass fibers that allow light beams to be bent and reflected with low levels of loss and interference are known as "glass optical wave guides" or simply "optical fibers."

This cable comes in two types, single mode and multimode, each with its own unique place in communications. Single mode FO cable is typically used where long distances and very high speeds are required, while multimode is used for intra-building communications and places where lower bandwidths are required.

FIBER-OPTIC CABLE. A cable containing one or more optical fibers.

INCUMBENT LOCAL EXCHANGE CARRIER (ILEC). An ILEC is the local telephone company that provides service to business, organizations, and residences within the LATA. The ILEC is responsible for the development, maintenance, and support of cabling infrastructure necessary to provide telecommunications services within the LATA.

INTERNET. A widely used public computer network, initially developed by the U.S. military that links smaller computer networks and allows users on different electronic-mail systems to communicate with one another on a global scale.

INTERNET PROTOCOL (IP). In TCP/IP, a connection Internet layer protocol that provides a best-efforts datagram delivery service. Note the functional layer (TCP/IP) corresponds to the OSI model network layer. The Internet layer provides routing and relaying functions that are used when data must be passed from a host to some other network on the Internet. It operates in the source and destination hosts and in all the routers along the path between the hosts.

ISP (Internet Service Provider). A company that provides access to the Internet to individuals or companies. Some ISPs lease connections from Internet backbone providers.

LANDLINE. Traditional wired phone service.

LAST-MILE. Last Mile is used to describe the final connection to a building, as differentiated from the high-capacity circuits extending across a city or County. The connection from the cable television trunk cable to your house is considered a "last-mile" connection.

NETWORK. Any connection of two or more computers that enables them to communicate. Networks may include transmission devices, servers, cables, routers, and satellites. The phone network is the total infrastructure for transmitting phone messages.

RF (Radio Frequency). RF refers to the electromagnetic waves operating between 10KHz and 3MHz propagated without guide (wire or cable) in free space.

RIGHT-OF-WAY. Right of Way (ROW) refers to a designated space alongside a street or other access (such as a railroad line). An entity wishing to install fiber optic cable between various sites/locations must first

obtain the rights to a path along those routes. As the cable may be installed underground or on poles, right-of-way access may be granted by a city, a private landowner, or the owner of poles such as a cable company, a telephone company or power company. Cities typically require written permits— usually for a fee.

SERVICE PROVIDER. A telecommunications provider that owns circuit switching equipment.

UPLOAD SPEED. The rate at which data is transferred from the user’s computer to the Internet is termed upload speed. This speed is typically stated in Megabits (1,000,000 bits) per second or Gigabits (1,000 Megabits) per second.

WAN (Wide Area Network. WAN is used to extend LAN connectivity beyond a city or County, usually through common carrier facilities.

WIRELESS. Wireless describes a means of sending signals (voice, video, or data) “over the air” rather than using cables. To date, wireless bandwidth rates (capacities) are significantly lower than wire rates. There are significant new developments in wireless, many of which will come to market in 2014 and beyond.

Appendix D Notes

Appendix D – Notes

- 1 <https://www.cisco.com/c/en/us/solutions/collateral/executive-perspectives/annual-internet-report/white-paper-c11-741490.html#Executivesummary>
- 2 <https://arstechnica.com/tech-policy/2019/04/charter-avoids-getting-kicked-out-of-new-york-agrees-to-new-merger-conditions/>
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- 5 <https://www.nokia.com/blog/redoing-the-math-the-impact-of-covid-19-on-broadband-networks/>
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- 7 <https://www.fcc.gov/general/broadband-deployment-data-fcc-form-477>
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- 10 <https://www.starlink.com/faq>
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- 12 Federal Register / Vol. 84, No. 239 / Thursday, December 12, 2019 / Notices 67913
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