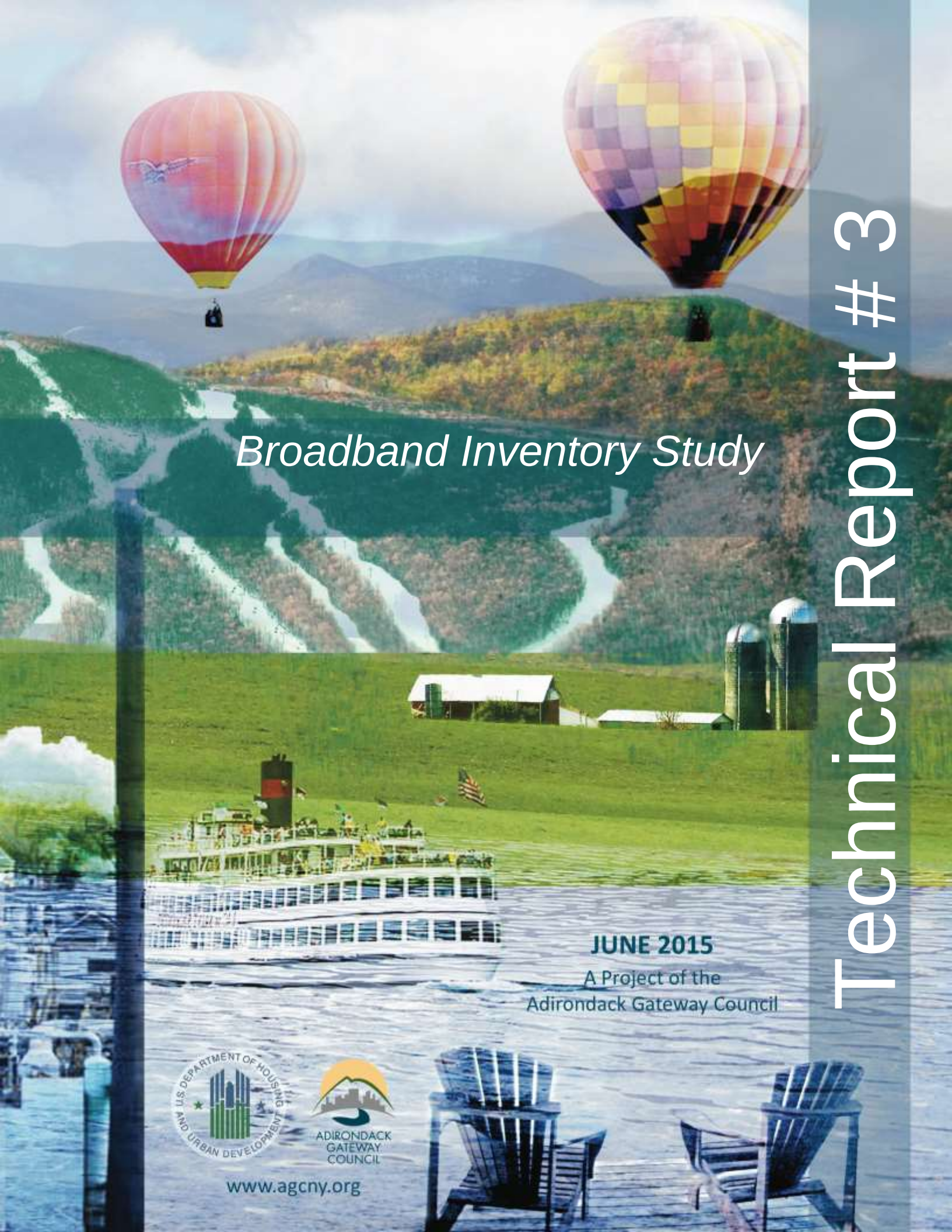

Broadband Inventory Study

Technical Report # 3

JUNE 2015

A Project of the
Adirondack Gateway Council

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

ADIRONDACK GATEWAY COUNCIL

www.agcny.org

Adirondak Gateway Council Broadband Inventory Study

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SECTION 1

COMMISSION OF THE STUDY

1.1 Introduction

In August of 2013, the AGC contracted with ECC Technologies to perform a study of the broadband infrastructure and services within the AGC Regions which encomapaases Warren, Washington and the northern half of Saratoga Counties.

This study was to consist of a Telecommunications Infrastructure Inventory, a Fiber Needs Assessment, and a Preliminary Analysis. The purpose of this study is to gather and document broadband infrastructure and services information, which will be used to support economic development within the County, expand broadband availability for all residents of the region, and better support regional planning.

The first phase of the project, the Telecommunications Infrastructure Inventory**,** was to inventory the current broadband infrastructure and services available in the region. The data obtained was used to compile maps and databases consisting of the following information:

A. Broadband Infrastructure
   - Fiber optic and coaxial cable locations.
   - Cell site locations, occupants, and wireless service providers.
   - Central Office locations and wire center boundaries

B. Telecommunications and Broadband Service Providers
   - Service provider contact information (ILECs, CLECs, CATV, ISP, wireless)
   - Coverage area and areas of operation
   - Services offered at each Central Office

All information has been gathered to the extent that the field survey could identify and as in as much detail as the broadband infrastructure owners and service providers were willing to make available. The information contained herein has been documented to include current ownership of the fiber and coaxial lines, services available by each provider, other infrastructure, and future development and investment plans.

Two other phases of the Agreement with ECC Technologies will follow and build upon this Broadband Inventory Summary. The second phase, the Needs Assessment, will consist of understanding and documenting the region's broadband needs and relating them to adding Open Access fiber and/or wireless infrastructure into the needed areas. As part of the assessment phase, ECC will seek to identify potential entities that might be interested in working with the community to fill the gaps including service providers, wireline and wireless broadband providers, and enterprise customers.

In the final phase, ECC will develop a preliminary outline that will demonstrate the potential partnerships and roles of entities brought forward to assist in determining if the addition of infrastructure is sustainable and will be the basis for applying for grant dollars or other means to pay for the construction, operation, and maintenance of expanded broadband infrastructure. When an initiative is funded a complete business plan, including a business development process, would be necessary to ensure the success of the project.

The business development process consists of working with stakeholders and potential infrastructure users to determine the potential revenues that can be expected to aid in the placement of access locations to the infrastructure. Potential revenue dollar expectations are developed to demonstrate sustainability of the infrastructure, while the user locations help determine preliminary infrastructure routing.

The three phases of this Study complement each other, so that when used together, each phase will greatly assist the region in understanding, planning, creating, and enhancing broadband access for its residents and businesses.

1.2 Importance of Broadband

Broadband, and specifically broadband communications, have transformed the way in which people communicate, educate, congregate, and live. Whether by landline telephone, mobile telephone, Internet, email, video conferencing, or other cellular and wireless technologies, people want and in some cases need to be connected everywhere and all of the time. Today there is almost no facet of our daily lives that is not impacted by broadband communication technologies. In addition to the personal impact broadband has on individuals, it can have an even greater impact on a community. Broadband has become in the 21st century what railroads were in the 19th century and interstate highways were in the 20th century. Broadband is an infrastructure necessity and those communities that have it will prosper while those without it will not.

Employment

Every prospective employee looking for work knows that broadband connectivity is a must. Jobs are listed online, applications are filled out online, and resumes are sent electronically. Looking for work *is* work, and without the proper tools a prospective employee is at a considerable disadvantage. The most important tool is an Internet connection with broadband connection speeds so that job posting websites can be accessed, profiles can be created on networking sites, resumes can be sent electronically via e-mail, and job offers can be received electronically. An electronic resume and the skill to maneuver on the Internet to look for and respond to employment opportunities are essential for today's job seeker.

Economic Development

Broadband enables local communities and regions to develop, attract, retain and expand job-creating businesses and institutions. It also improves the productivity and profitability of large, small, and home-based businesses in many ways and opens their products to new markets locally, nationally, and even globally.

Education

One of the key developing trends in the United States is that education has become a lifelong pursuit that encompasses a wide range of activities, from pre-Kindergarten programs to continuing education classes for professionals. At a time of increasing globalization and technological dependence, failure to adequately prepare students will limit their ability to compete for jobs that require a new level of literacy that involves creative, innovative problem-solving and the ability to use a variety of advanced information and communication technologies.

High speed broadband has a critical role to play in today's educational infrastructure. It has the ability to deliver more knowledge to more students at a lower cost and at a more flexible time than traditional teaching methods.

Real Estate

High speed broadband will have a positive impact on real estate sales and property values. The absence of broadband can encourage a potential purchaser to make a decision to favor one property over another or one community over another. Progressive communities such as Kansas City, Raleigh, Atlanta, Charlotte and others are developing Gigabit to the home strategies in an attempt to draw and retain businesses and professionals.

Healthcare

Broadband makes remote access to clinical services for patients possible and provides significantly improved, cost-effective access to quality healthcare. It allows physicians to monitor their patients through innovative home health devices and provides patients with real-time feedback.

There are many examples in the healthcare industry of collaboration and consultation between physicians and specialists not in close proximity geographically. It is not uncommon for a physician to electronically send test results, x-rays, ultrasound images, CAT scan images, and supporting documentation to a physician who has a specialized expertise for a second diagnosis. Given the size of the files only broadband can accomplish this. In addition, many healthcare entities are starting to use private fiber networks to get the needed bandwidth and security for transferring confidentially sensitive medical records and billing information.

Government Consolidation

Broadband assists government agencies in improving the quality of services it provides by allowing access to tax records, voting records, budgets, service departments, and tax maps to name just a few. Broadband allows citizens to more readily communicate with public agencies and elected officials through e-mail.

Government organizations across the country are using broadband to consolidate services between towns, cities, and counties to lower costs and improve services. E-government is the term used to describe interactive applications with the community.

Telecommuting

According to the U.S. Bureau of Labor Statistics in the report The Hard Truth About Telecommuting by Dr. Noonan and Dr. Glass, the growth of multiple days per week employees (not including self-employed) who telecommute increased 73% from 2005 to 2011. Though the rate of growth slowed during the recent recession to 4.1%, in 2011, 3,148,313 employees, or 2.5% of the workforce, worked from home. In 2013 2.6% of Americans telecommuted. This number is expected to grow, but growth can only occur in areas that have adequate and affordable broadband service.

Senior Citizens and Disabled Persons

Broadband allows for home-based rehabilitation and health monitoring devices for senior citizens. This allows these individuals to gain access to services in their homes rather than in institutional settings. It also allows seniors more options to live anywhere they choose and still stay connected

with medical care, their families and friends, participate in online educational classes, or start new careers or projects after retirement.

Broadband is an important tool in addressing the needs of disabled individuals. With broadband-based applications and supporting technologies, deaf and hearing impaired individuals can communicate with one another through sign language using webcams, and visually impaired people can use "screen reader" programs that audibly describe website material to users. Software programs exist to interpret screen content into Braille. Broadband also permits users of Telecommunications Relay Services (TRS) to use Video Relay Services (VRS) to communicate more readily with voice telephone users.

Consumer Savings

In a study recently released by the Internet Innovation Alliance (IIA), as reported at http://www.Internetinnovation.org/, it was shown that U.S. residents can save nearly $8,400 this year in entertainment, clothing, food, and other expenses by subscribing to broadband compared to a savings of $7,695 last year. During the week of December 8 through 14, U.S. consumers spent $6.9 billion online—an 11% increase over 2011—according to data released by market analyst comScore and reported by Steven Musil of c|net in an article published December 16, 2012.

"The savings difference between this year and last is due to a rising cost of products and services offline and an increase in comparison shopping services on the web," said Bruce Mehlman, the IIA's co-chairman. "Consumers are spending more, and there are more opportunities for differential pricing" between offline and online products as the U.S. economy improves, he said.

Access to the Internet allows shoppers to compare prices on a wide variety of items and gives them access to a larger inventory of products. Shoppers can also find web-only discounts and coupons. In addition, consumers can save gasoline costs by shopping online and by avoiding a drive to the store. Overall, online access provides a variety of ways to save money.

1.3 Current State of Broadband

Broadband and Broadband in the U.S.

1. The Federal Communication Commission (FCC) created the Telecommunications Act of 1996 to establish competition and facilitate growth in the broadband industry. Prior to 1996, the broadband industry was a government regulated monopoly. After the Telecommunications Act, new, competitive telephone companies called Competitive Local Exchange Carriers, or CLECs, emerged and provided consumers with a choice of providers and services. During the same period of time other non-traditional broadband providers, driven by technology, emerged. These new players to the broadband industry, namely cable TV, network providers, and wireless providers, offered alternative and competitive broadband services.

2. **According to Cisco Systems we can expect the following;**

   An increasing number of devices: The proliferation of tablets, mobile phones, connected appliances and other smart machines is driving up the demand for connectivity. By 2015 there will be nearly 15 billion network connections via devices—including machine-to-machine—and more than two connections for each person on earth.

More Internet users: By 2015, there will be nearly 3 billion Internet users—more than 40 percent of the world's projected population.

Faster broadband speed: The average fixed broadband speed is expected to increase four-fold, from 7 Mbps in 2010 to 28 Mbps in 2015. The average broadband speed has already doubled within the past year from 3.5 Mbps to 7 Mbps.

More video: By 2015, 1 million video minutes—the equivalent of 674 days—will traverse the Internet every second.

Broadband in New York

Over the last decade, New York has expanded broadband planning and initiatives. In 2012 and 2013 the New York State Broadband Programs Office has awarded grants to rural areas for the deployment of broadband technologies to rural areas of the State. The New York State Broadband Progrms Office is tasked with helping connect all New Yorkers to the Internet by working with the individual counties and entities across the state to promote broadband adoption and expansion.

Broadband and the Digital Divide

A technology division is occurring across the nation, across New York, and here in the AGC region. It is a division between the areas which are mostly urban that have access to high speed, affordable broadband service and those that do not have such access, which are mostly rural. This division of broadband service has been labeled the "digital divide."

One of the things urban counties have in common is a more developed broadband infrastructure. Employers have more choices for broadband connectivity. Families have greater access to high speed broadband for themselves and their school age children. But a business does not have to be located in the City of Glenns Falls or Saratoga to be successful. There just has to be comparable infrastructure, which includes high speed broadband, for that business to succeed.

Progressive communities are now pursuing Gigabit to the home initiatives. These communities know that investing in the broadband infrastructure will not only increase speeds but also increase Internet usage and foster economic development for their regions. The demand for bandwidth will continue to increase as households add more devices that require greater bandwidth speeds. Gigabit to the home will become the new digital divide.

Broadband and broadband access in particular have become one of the essential infrastructure resources for economic development, on par with paved roads and reliable electric power, that allow a community to compete, thrive, and grow in the 21st century. This study is the first step in allowing the AGC region to grow from a broadband infrastructure standpoint. By identifying what broadband resources are available and what areas are without broadband, community leaders will be better able to plan the regions future.

1.4 Study Methodology

AGC contracted ECC Technologies to inventory the broadband infrastructure and services supporting the region. The information ECC collected has been compiled into a GIS database by the Warren County GIS Department and ECC's own GIS department.

The GIS database provides both mapping and database information related to broadband mapping elements (e.g. Central Offices, LEC coverage areas, wireless tower locations, and fiber optic lines).

The GIS database can determine by location what carriers and services are available in a given area. The AGC will act as a clearinghouse for the dissemination of GIS mapping and data.

Service providers included in the Inventory are:

- Local Exchange Carriers (LECs)
- Inter-Exchange Carriers (IXCs)
- Internet Service Providers (ISPs)
- CATV service providers
- Network service providers
- Dark fiber providers
- Wireless Service Providers (WISPs)

Research Methodology

To gather the information required for this study, ECC technologies conducted one-on-one interviews with the major broadband providers and performed field surveys, or "on-site surveys," to identify and document outside plant (OSP) or cabling infrastructure. Publicly available databases managed by Federal and State agencies and information purchased from telecom industry database research organizations were additional sources used to complete the inventory.

Outside Plant Engineering

ECC's experienced Outside Plant (OSP) Engineers conducted a field data collection inspection. These individuals are educated and experienced in locating and identifying communications infrastructure. In addition they are familiar with design and construction methods of communications cables. They spent months in the region finding and identifying broadband infrastructure.

The OSP Engineers found several owners of fiber optic cable in the region. In addition to cable that was identified there was also cable found with no physically identifying information that would allow us to attribute it to a broadband provider and therefore was classified as "unknown." It is important to remember that all cables have been identified "to the extent possible."

Contacted Providers

The broadband providers in the region were contacted via telephone, in person, and/or by email. Each organization contacted identified the appropriate individual within their respective company and that person was informed of the study and its intent and allowed to provide information on their services.

Public Information

ECC obtained broadband industry data publicly available from Federal and State organizations. Some of these include but may not be limited to the FCC and FAA.

Industry Resources

Other resources included GeoTel and Telcordia, broadband industry research companies, broadband provider websites, broadband industry professionals, ECC Technologies' experienced Outside Plant Engineers that conducted outside plant (windshield) surveys for broadband route identification, and knowledge of the broadband industry.

GIS Mapping/Database

All infrastructure information in this inventory project has been integrated into a GIS model developed by the GIS department at Warren County. This GIS database will be administered, stored, and updated by the GIS department to ensure security and continuity of the resource.

The GIS database of information was developed to support broadband and economic development initiatives going forward. This information will be used by the Economic Development and Planning Department for region and local use. Most of the maps included in this report represent the area's broadband infrastructure surveyed and documented in the fall of 2013 and spring of 2014.

SECTION 2
AGC STUDY OVERVIEW

This study includes an analysis of all the technologies available to bring broadband service to the AGC Region. A brief overview of these technologies may help put the findings and recommendations in perspective.

Wire Line Infrastructure

Wire line infrastructure includes telephone and cable TV cables, which are either buried in the ground or attached aerially to utility poles. Wire line cables can be twisted pairs of copper wire, coaxial cable, or fiber optic cable. The wire line infrastructure for the region is primarily owned and operated by the Incumbent Local Exchange Carriers (ILECs), the cable TV company, and two additional fiber based providers.

Copper Telephone Infrastructure

Traditional telephone copper cable is still the predominant infrastructure serving homes and businesses in the region. Copper cable is used by the telephone companies to connect Central Offices (the building location for telephone switch equipment) to end users for the purpose of providing traditional voice and data services. It should be noted that copper cable has a limited capacity for broadband service. This factor is typically the reason why advanced broadband services are not available in many areas.

The limitation of providing broadband access over copper infrastructure is in direct proportion to the distance from the Central Office or remote signal boosting site, the age of the cable, and the relatively poorer performance qualities inherent in the cable itself.

The majority of residential telephone service in AGC is supplied by copper cable infrastructure that consists of pairs of unconditioned twisted copper wires and is commonly referred to as POTS or "plain old telephone service." In addition to being able to support a single telephone call, POTS lines are capable of providing up to a 56Kbps "dial up" analog connection for Internet use. Nearly all businesses and organizations require services faster than a typical dial up connection.

In an effort to provide a faster service over existing copper lines, the telephone carriers developed digital data communications services called Digital Subscriber Line (DSL) technology, which is a form of broadband. DSL can use a POTS line to deliver bandwidth services of up to 18Mbps service, depending upon the type of DSL, the quality and age of the copper wire, the quality and age of the transmission equipment, and most especially the distance from the last point of transmission equipment. These are the key factors in determining the bandwidth or speed available to the end user. Since its introduction into the broadband industry, DSL has become a popular service for the incumbent providers, since it requires only the addition of equipment and not the replacement of cable. A drawback of the technology, however, is that it requires that customers be within 12,000 feet of the last DSL repeater or signal boosting equipment.

Coaxial Cable TV Infrastructure

The cable TV (CATV) industry utilizes a hybrid fiber optic and coaxial cable network to provide high quality video, high speed data, and voice services to their customers in the region. The high

performance characteristics of coaxial cable make it possible to support the transmission of telephone, video, and data simultaneously over greater distances. Broadband access is available in many parts of the region via this hybrid fiber/coaxial infrastructure installed by the incumbent cable TV providers.

Time Warner uses cable modem technology, which utilizes a single coaxial cable TV connection to a customer location to support the simultaneous transmission of telephone, video, and data. Time Warner is the provider of cable TV services in most of the region.

Fiber Optic Infrastructure

Broadband companies have fiber optic cabling installed in the region, using it primarily as an aggregation or a backbone resource. This infrastructure is used to interconnect Central Office locations, aggregate copper and/or cable lines, or in some cases to make high speed connections to customers. Time Warner, Verizon, Citizens, FirstLight, and PrimeLink each have fiber in one or more of the three counties. The fiber is used as backbone infrastructure to extend service to Central offices, Remote cabinets, headends, neighborhoods and communities. The telephone companies, the cable TV providers, and the fiber network companies such as PrimeLink have made a considerable investment in fiber optic infrastructure along the major traffic cooridoors of the region. Newcommers such as SLIC will also continue to develop fiber infrastructure thoughout the region

Wireless Infrastructure

Wireless technologies are the fastest growing segment of the broadband industry. Wireless infrastructure supports cell phones, pagers, mobile data terminals, messaging, and Internet services. Wireless antennas or access points (AP) are located on towers, tall buildings, and even water towers. In many instances the wireless infrastructure installed in AGC can offer connectivity in areas where landline infrastructure does not. In some instances in AGC due to geographical impediments and the cost of the building landline infrastructure, wireless infrastructure may be a more effective and affordable method to serve areas of low population density. In the town of Thurman a white space trial is underway which if successful may provide options to rural areas of the region.

There are currently 38 wireless towers (either registered on the FCC or FAA websites or confirmed by a wireless provider) constructed in the region. The majority of these towers are located on major roadways and population centers, with the highest concentration of towers positioned in and around Glenns Falls. Cellular coverage was described anecdotally by many to be “spotty” once outside the developed areas of the region. The service coverage of a typical cellular equipped tower can be between one and ten miles depending upon the equipment in use, how the equipment is configured, the terrain, and the height of the towers.

Cellular towers are used by the wireless phone service providers to transmit voice and data sessions from one area or “cell” to another. These towers are strategically placed to provide the maximum coverage with the least number of towers. Cellular antennae on towers in the region are placed primarily along major traffic corridors and populated areas throughout the County so that the cellular companies can provide coverage to the highest number of users. Cellular towers are connected to the Public Switched Telephone Network (PSTN). Current cellular offerings, such as 4G, require fiber connectivity because of the bandwidth demands placed upon them. In fact, the wireline demands placed upon most 3G equipped data antenna is approximately 20Mbps and can be accommodated with copper or coaxial cable. Towers equipped with 4G technology must be served by fiber optic technology because bandwidth demands are typically 200Mbps and growing. Subsequently, cellular

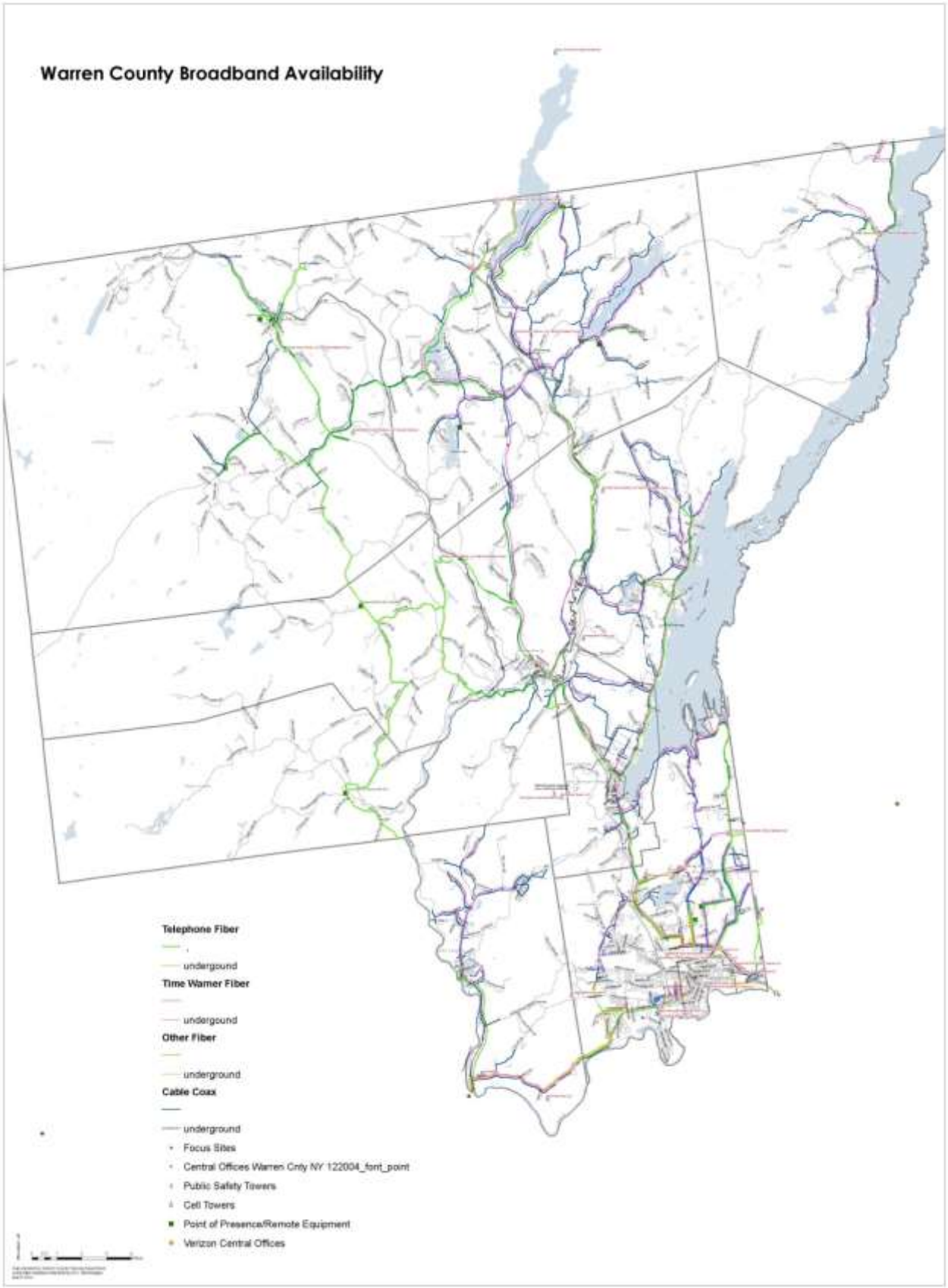
providers are becoming major customers of fiber optic connectivity to their towers in order to provide the seamless, high bandwidth services customers have come to expect and applications have come to demand.

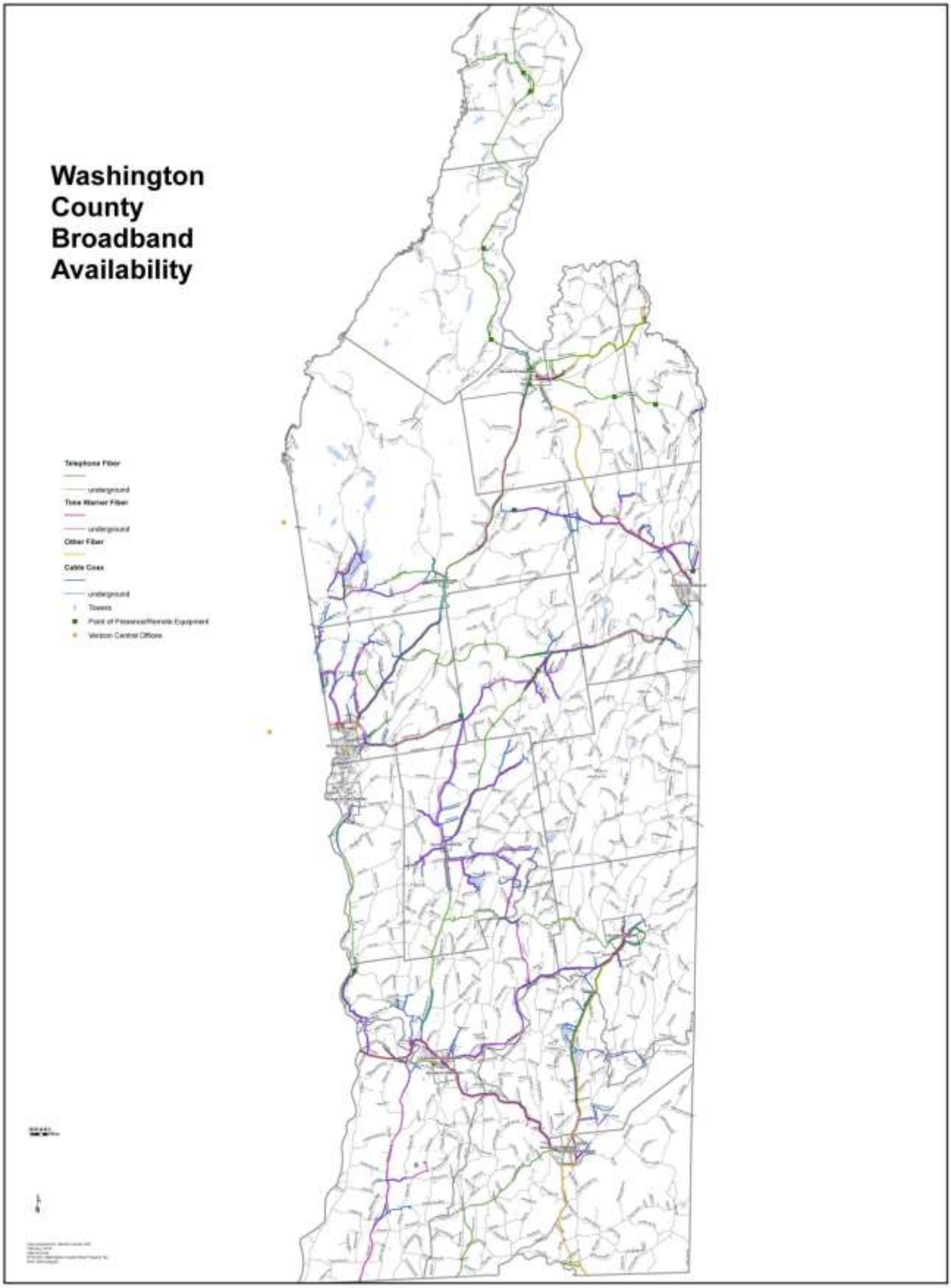
Small cell technologies, which are not currently deployed in significant quantities in the region, will begin to emerge in the coming years. Small cell essentially establishes similar capabilities as a tower in defined areas of a community. Generally small cell deployments will be found in areas where current cellular capacities are oversubscribed, such as sporting events, downtown business sections, etc. Small cell technologiers will see deployments in urban areas on utility poles, buildings, and low priofile antennas. In rural areas it is believed that small cell will play a role by being mounted on existing utility poles, transmission facilities, etc. In either case small cell sites will be connectied via fiber infrastrcutre.

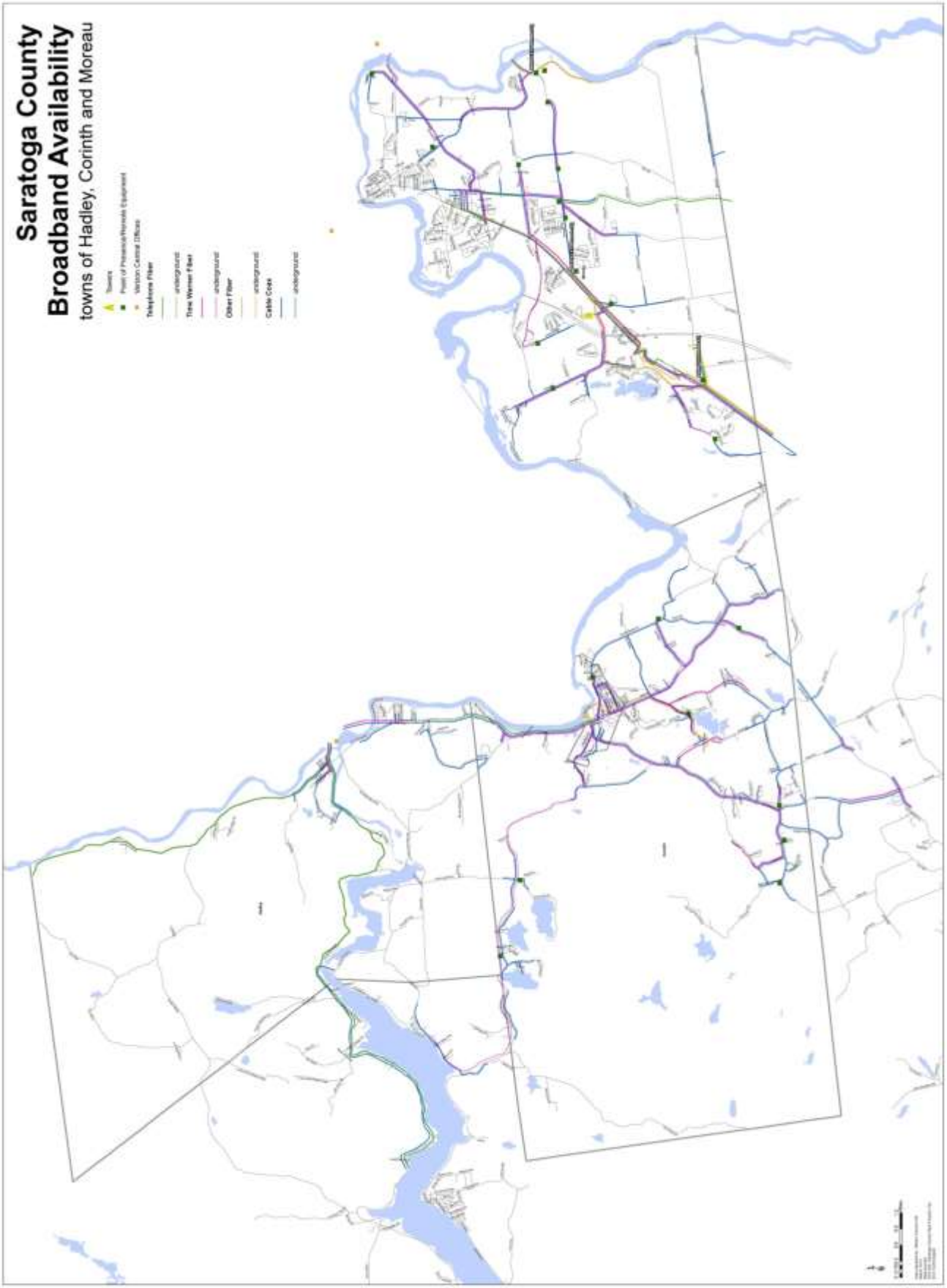
Overview

ECC has found that the region is well served along the major traffic corridors and in the cities and villages. The towns of Glens Falls and Queensbury have access to at least one high speed broadband provider with competitive access widely available. Comparitively speaking, we have found the services along the Rt. 9 corridor are consistent with what we have found in other similar areas across the State. However, the areas outside these more population dense areas of the region have much less coverage. These are typically the more remote sections of Warren and Washington Counties.

As the maps on the following pages will show, there are areas of the region that could benefit from additional investment in diversified fiber and/or wireless broadband service, particularly in the northeastern and northwestern portions of the region.


Warren County Broadband Availability
Telephone Fiber
underground
Time Warner Fiber
underground
Other Fiber
underground
Cable Coax
underground
Focus Sites
Central Offices Warren Cnty NY 122004_fort_point
Public Safety Towers
Cell Towers
Point of Presence/Remote Equipment
Verizon Central Offices


Washington County Broadband Availability
Telephone Fiber
underground
Time Warner Fiber
underground
Other Fiber
Cable Coax
underground
Towers
Point of Presence/Remote Equipment
Verizon Central Offices


Saratoga County
Broadband Availability
towns of Hadley, Corinth and Moreau
Towns
Point of Presence/Remote Equipment
Verizon Central Offices
Telephone Fiber
underground
Time Warner Fiber
underground
Other Fiber
underground
Cable Coax
underground

SECTION 3
WIRELINE PROVIDERS AND WIRELINE INFRASTRUCTURE

3.1 Broadband Infrastructure

Broadband in the region is delivered by a number of competing providers using different technologies and infrastructures. The primary owners of broadband infrastructure in the region include the two incumbent telephone companies (Verizon and Citizens), one cable TV provider (Time Warner), one Competitive Local Exchange Carrier (Windstream), and two independent fiber network providers (Primelink and FirstLight). These wireline organizations provide voice, video, and data services using a variety of technologies and infrastructures, which include land-based telephone, cable television (CATV) lines, and fiber optic cable. In addition, there are five wireless carriers—Verizon Wireless, AT&T, T-Mobile, Sprint and Cricket Wireless—providing 3G and 4G broadband service. AT&T is the parent company of Cricket Wireless. There is one Wireless Internet Service Provider (WISP), Hudson Valley Wireless, providing a wireless broadband product.

The broadband providers in AGC are delivering service to homes, businesses, and other organizations at varying degrees of access, performance, and costs. The predominant broadband infrastructures in use by the industry today in the region are terrestrial based landlines or wire lines consisting of copper, coaxial cable, and fiber optic cable. Wireless based broadband technology utilizing strategically placed towers is also available in some locations.

3.2 Incumbent Local Exchange Carriers

An Incumbent Local Exchange Carrier (ILEC) provides telephone services within a defined local calling area. ILECs are important because they have Carrier of Last Resort (COLR) obligations to ensure that every citizen has access to telephone service. The ILEC is responsible for the development, maintenance, and support of telephone cabling infrastructure necessary to provide broadband services within the calling area. In AGC there are two ILECs: Citizens and Verizon.

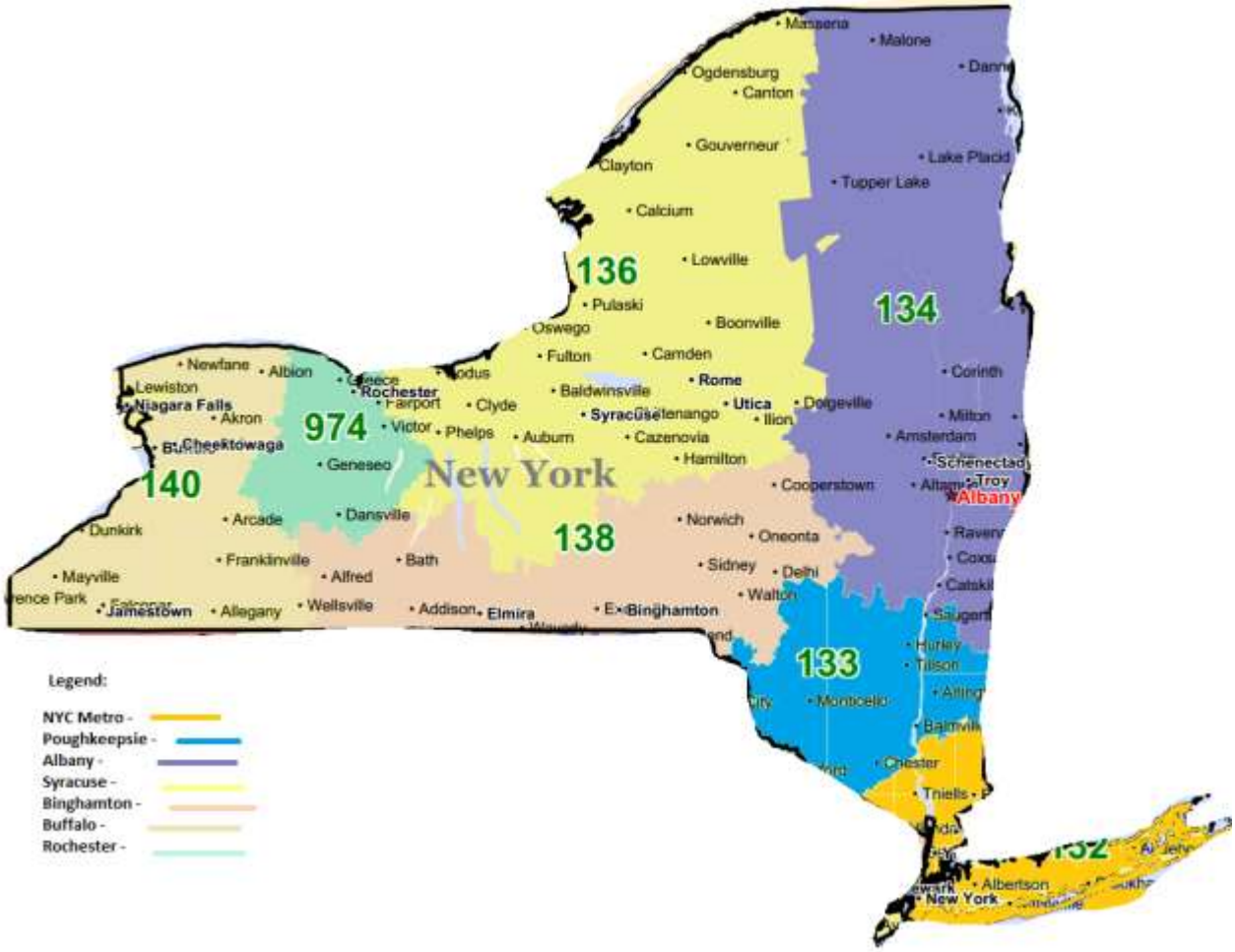
The local contact for each ILEC service provider is below.

Incumbent Local Exchange Carrier (ILEC)		
Company Name	**Contact Name**	**Contact Phone Number**
Verizon	N/A (must call NJ offices)	(800) 837-4966
Citizens/Frontier	Robert McCarthy	(518) 773-6138

LATAs and Area Codes

LATAs are local wireline service areas prescribed by the federal government. The AGC is in the Albany region's Local Access Transport Area (LATA) designated as LATA 134. Telephone numbers in the AGC use the 518 area code number.

The map shows the LATAs and area code boundaries for the State of New York. The different color shaded areas represent the different LATAs. The heavy black lines outline the boundaries for the various area codes.

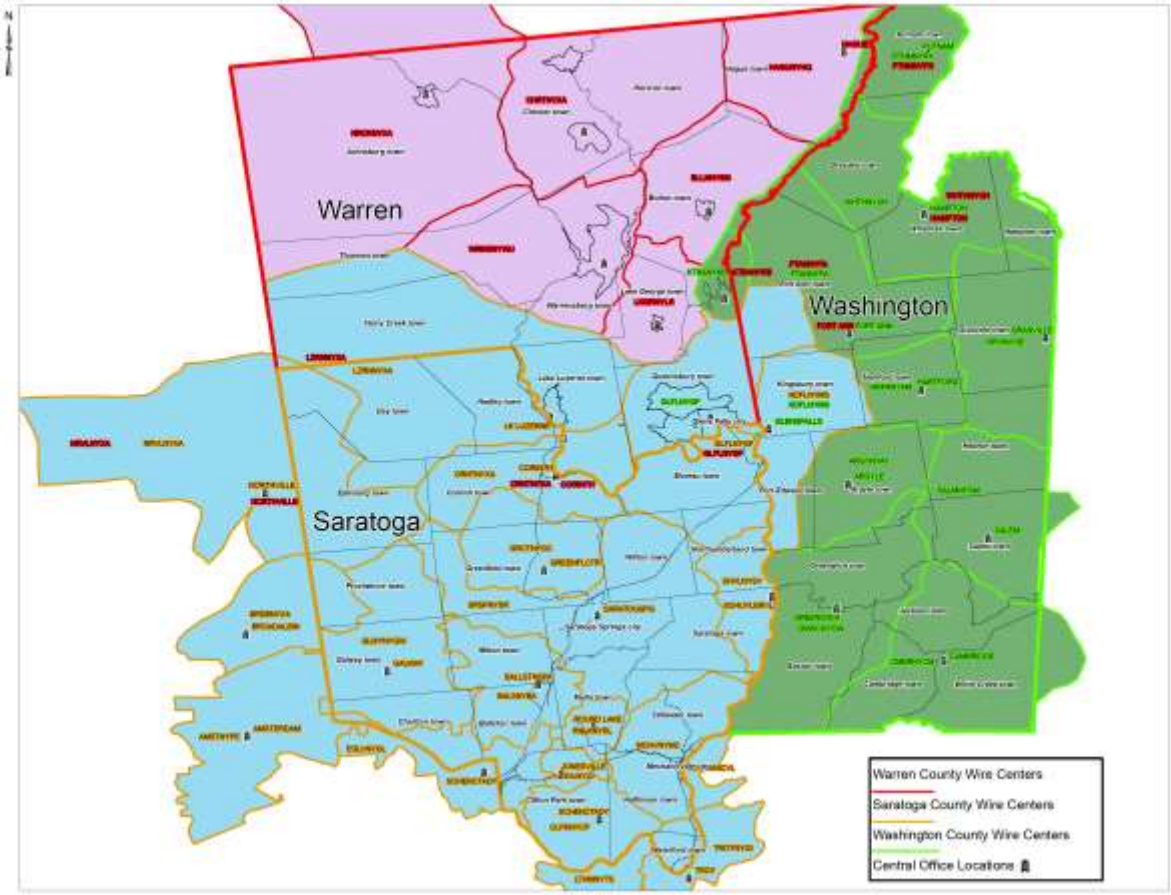


Central Offices

The Central Office (CO) is the physical location where the Incumbant Local Exchange Carrier (ILEC) maintains the broadband equipment infrastructure that delivers voice, data, and video services. The ILEC's fiber and cable infrastructure terminate on one end at the customer's location and on the other end in the CO building. In basic terms, a CO is a location where a large number of network cables terminate onto equipment that transmits, receives, and translates signals. The services available from the local Central Office for a given area determine the level and availability of services within that ILEC's wire center boundary or area. The County has two ILECs that have installed and provided service from a number of COs.

AGC is served by nineteen Wire Center boundaries, three by Citizens and sixteen by Verizon. The Wire Centers are depicted in the map on the next page. Wire Center boundaries do not necessarily follow County lines, so the COs for some Wire Centers providing service within AGC are located outside of the County. The map shades in the Wire Centers for each ILEC as follows:

Wireline Boundaries



Verizon Territory CO's:
Warren County – Purple
Johnsburg/ North Creek- NRCKNYXA
Hague - HAGUNYHQ)
Bolton - BLLNNYBG
Lake George - LKGRNYLR
Warrensburg - WRBGNYWU

Washington County – Green
Putnam – PTNMNYPX
Whitehall/Dresden/Hampton – WHTHNYUH
Fort Ann – FTANNYFA
Katskill Bay – KTBANYK
Granville – GRVINYGE
Hartford – HRFRNYHR
Argyle – ARGYNYAY
Salem/Hebron – SALMNYSM
Greenwich/Easton – GNWCNYGW
Camnbridge/Jackson/White Creek – CMBRNYCM

Saratoga County – Sky Blue
Glens Falls/Queensbury/Moreau – GLFLNYGF

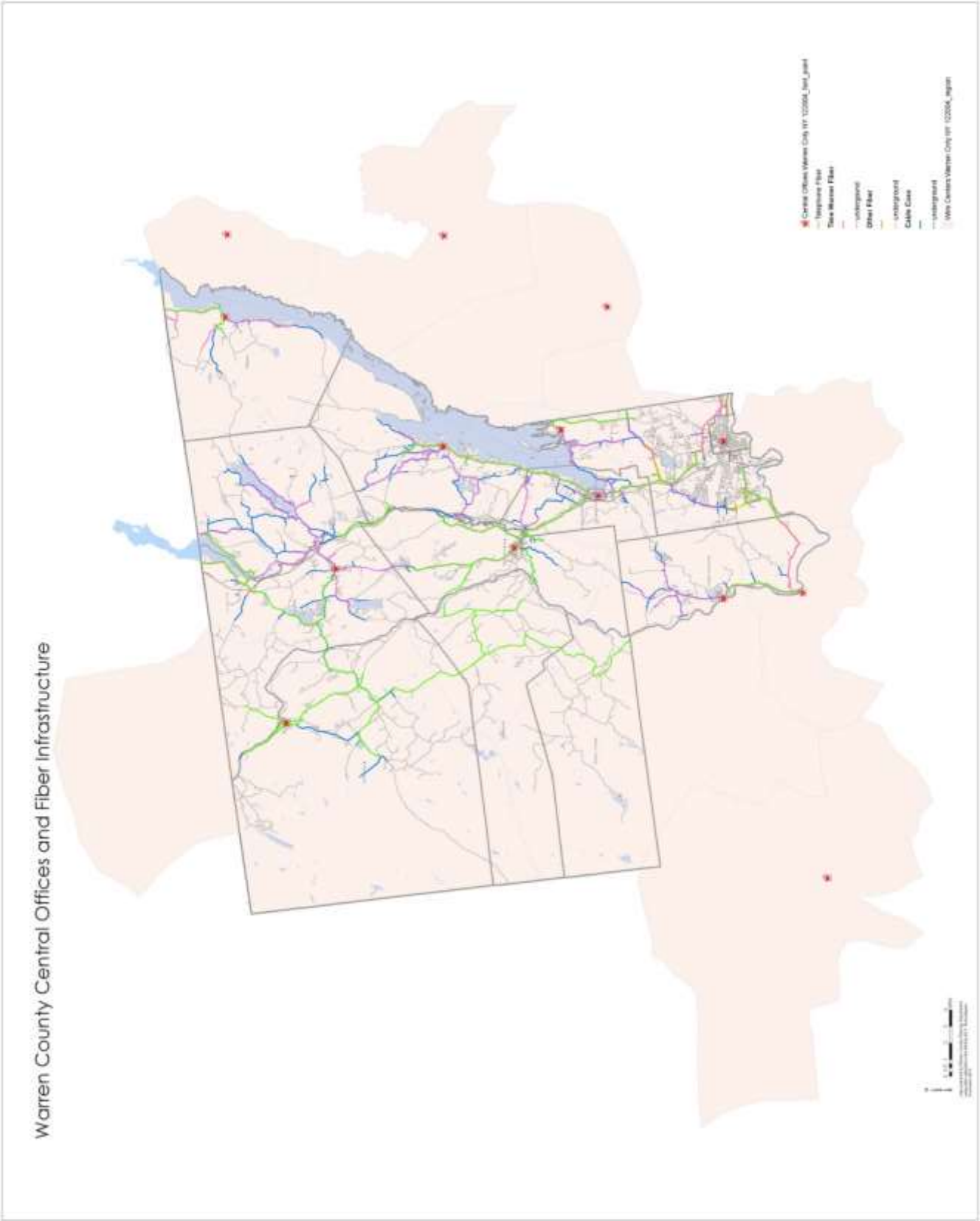
Citizens Territory CO's:
Warren County – Purple
Chester Town – CHRTNYXA

Saratoga County – Sky Blue
Lake Luzerne/Stony Creek/Hadley – LZRNNYXA
Corinth - CRNTNYXA

AGC Inventory Summary Report

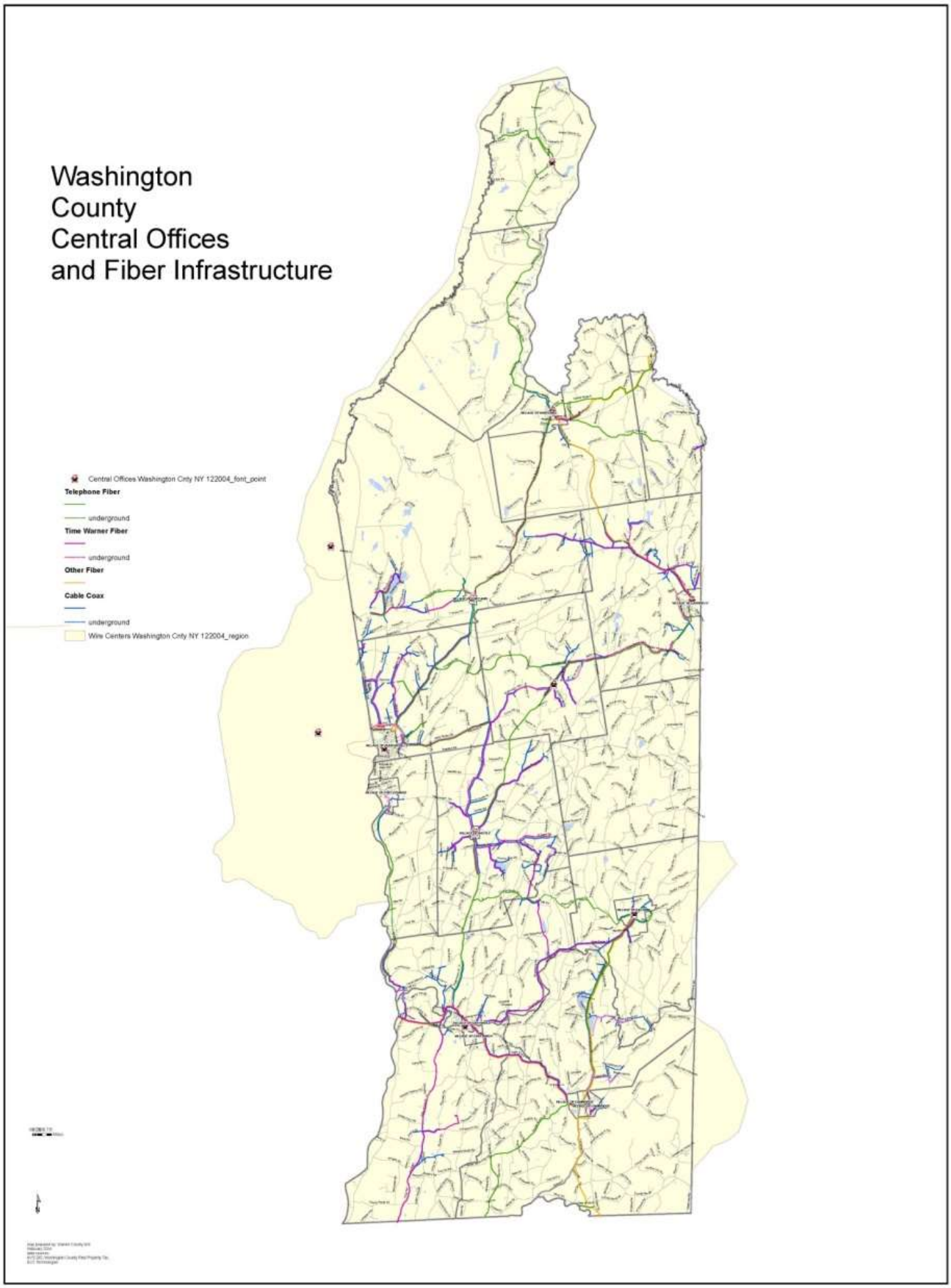
The are eight Central Office locations within Warren County. They are designated by the red icons in the towns designated below:

Location Identifier	Municipality	Provider
LKGRNYLRRS0	Lake George	Verizon
GLFLNYGFDS0	Glens Falls	Verizon
NRCKNYXADS0	North Creek	Citizens Telecomm
HAGUNYHQ	Hague	Verizon
BLLNNYBG	Bolton Landing	Verizon
LZRNNYXA	Lake Luzerne	Citizens Telecomm
WRBGNYWU	Warrensburg	Verizon
HDFLNYMSRS0	Hudson Creek	Verizon


Warren County Central Offices and Fiber Infrastructure

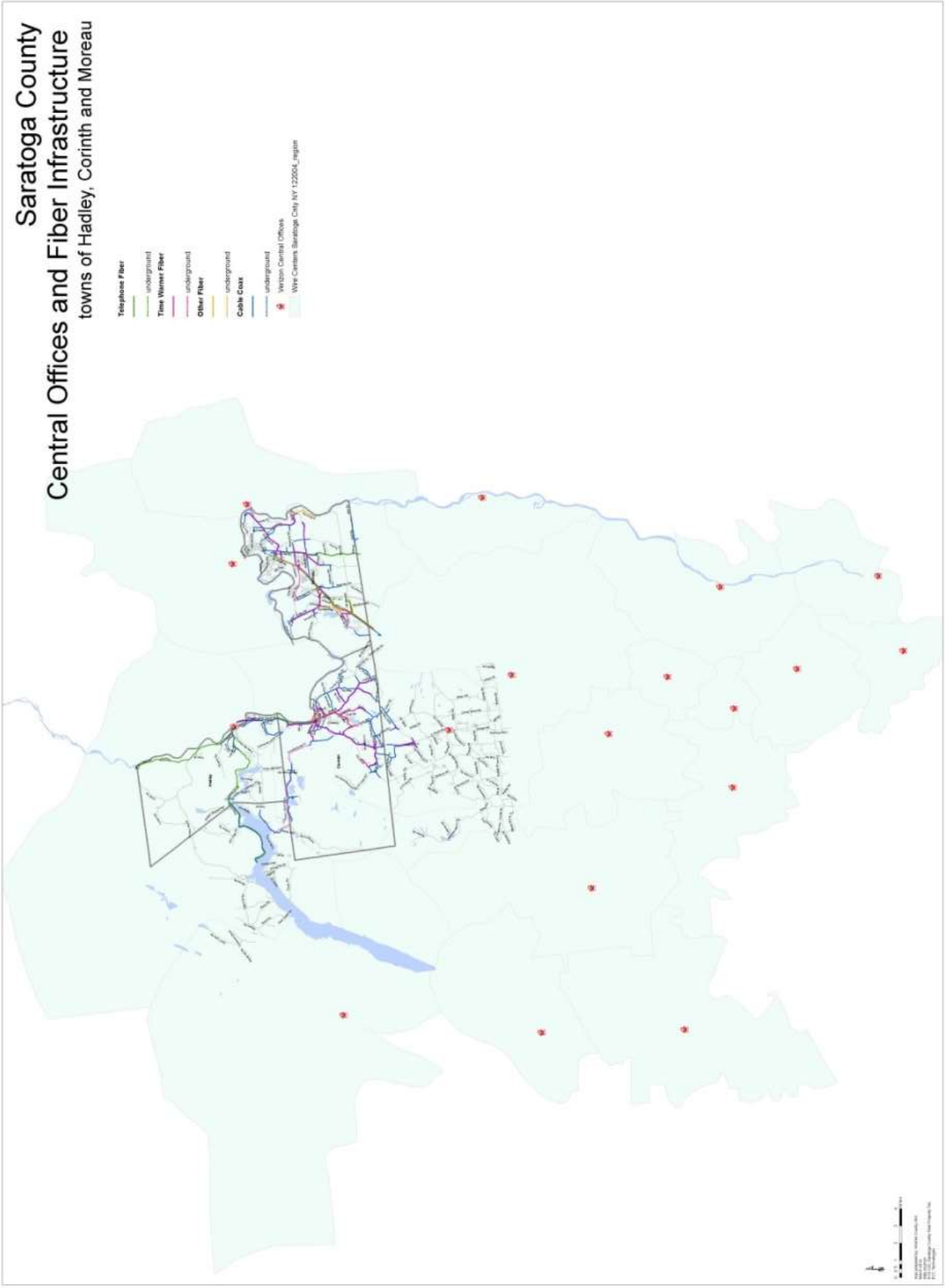
There are 11 Central Offices in Washington County. They are designated by the red icons in the map below:

Location Identifier	Municipality	Provider
PTNMNYPXRS0	Putnam	Verizon
WHTHNYUHRS0	Whitehall	Verizon
KTBANYKBRS0	Katskill Bay	Verizon
FTANNYFARS0	Fort Ann	Verizon
ARGYNYAYRS0	Argyle	Verizon
SALMNYSMDS0	Salem	Verizon
GNWCNYGWDS0	Greenwich	Verizon
GRVINYGERS0	Granville	Verizon
HDFLNYMS	Hudson Falls	Verizon
HRFRNYHR	Hartford	Verizon
CMBRNYCM	Cambridge	Verizon


Washington
County
Central Offices
and Fiber Infrastructure
Central Offices Washington Cnty NY 122004_font_point
Telephone Fiber
underground
Time Warner Fiber
underground
Other Fiber
Cable Coax
underground
Wire Centers Washington Cnty NY 122004_region

There is one Central Office in the Northern part of Saratoga County. The town of Hadley is served by the Lake Luzerne Central Office in Warren County and the town of Moreau is served by the Glens Falls Central Office, also in Warren County.

Location Identifier	Municipality	Provider
CRNTNYXADS0	Corinth, NY	Citizens Telecom


Saratoga County
Central Offices and Fiber Infrastructure
towns of Hadley, Corinth and Moreau
Telephone Fiber
underground
Time Warner Fiber
underground
Other Fiber
underground
Cable Coax
underground
Verizon Central Offices
Wire Centers Saratoga City KY 122004_region

3.3 CATV/Cable Providers

Time Warner Cable

Time Warner Cable's (TWC) sales office for the region is located in Glens Falls, NY. TWC's territory includes the entire County and provides strong competitive services to the incumbent's DSL service for residential areas.

TWC's Internet access service is available in multiple levels of bandwidth, including 7Mbps down and 756Kbps up to 50Mbps down by 5Mbps up and is the only cable modem service in the region. The technological characteristic of cable modem service allows TWC to provide Internet access to any area that has cable TV service. TWC has Internet networking equipment installed in all of the towns and villages in the County. TWC has invested significantly in their hybrid fiber/coaxial-based network system in the region over the years and has the capability to provide voice, video, and data service in many areas of the Adirondacks. Notable exceptions include low population areas and the western portion of Warren County.

Hamilton County Cable Television

Hamilton County Cable TV is an independently owned and operated cable provider. They provide basic cable and network channels and also an optional package of premium digital programming. They do not offer high speed Internet or voice services at the present time. Their coverage territory is mainly in Hamilton County, but they also offer residential cable service in the Northwestern portion of Warren County. Service in Warren County does not go beyond Route 8.

3.4 Network Fiber Providers

An interconnect network provider may be a LEC, IXC, cable TV, or ISP. Depending upon the geography being served, multiple providers may be required to interconnect a particular network. Network service providers can interconnect remote sites and provide high speed Internet connections. Availability and cost of these data circuits is dependent upon the carrier's cable plant, Point of Presence (POP) location, and equipment.

High bandwidth (broadband) services are defined by the FCC as data commication services that support download transmission rates of at least 4Mbps and upload speeds of at least 1Mbps. Broadband carriers provide high bandwidth services through a variety of technologies. Most network service providers can offer low speed services in areas they have wire based infrastructure. Fiber providers are significant in that they can offer services in very high bandwidth capacities.

There are two fiber optic cable providers that provide fiber optic network infrastructure in the County aside from the ILECs and the CATV, namely PrimeLink and FirstLight. These organizations offer many of the end user "lit" services businesses and public entities desire, including Ethernet and Internet access.

"Dark fiber" as used here is a broadband industry term that describes fiber optic strands (within a cable sheath) that are leased or sold to a customer without "lit services" being delivered over it by the leaser/seller. Lit services are voice, data, video, and Internet capability. What distinguishes dark fiber is that the customer who leases or purchases the fiber optic strand lights the fiber, and thereby operates and maintains the network that resides within that fiber strands. This type of fiber is typically used to connect multiple locations together over an end user's private network. The lessee

or owner can be another service provider or a non-broadband corporate or public entity. The advantage to dark fiber is that the end user controls the network and the technology used, however the end user is also responsible for the operation and maintenance of the network. Listed below are companies in AGC that provide this type of infrastructure.

Fiber Providers		
Company Name	**Contact Name**	**Contact Phone Number**
Primelink	Randy LaBombard	(518) 324-4115
FirstLight	Ed Novak	(617 388-4484

PrimeLink

PrimeLink is headquartered in Plattsburgh, NY and is a "full service telecommunications company." PrimeLink provides voice, data, and Internet services to both businesses and residences. These services are delivered over a fault tolerant fiber optic self healing ring with a capacity to meet any bandwidth requirements. In addition, PrimeLink can provide legacy type voice services as well as IP voice services, such as VoIP and hosted services. PrimeLink provides services in the Adirondacks to Montreal and throughout Canada. They own 240 miles of fiber from Albany to Montreal. The fiber runs mainly along the railway route.

PrimeLink will market dark fiber to certain customers where it makes business sense for them.

FirstLight

FirstLight is headquartered in Albany, NY. FirstLight, formerly known as Tech Valley Communications, was founded in 1999. The company name was changed to FirstLight in 2013. The company provides high speed data, Internet, colocation, and voice services to commercial customers in upstate New York, New Hampshire, Vermont, Massachusets and Maine. FirstLight delivers its services over its own fiber network. FirstLight owns approximately 190,000 miles of fiber optic cable in the areas where they do business.

FirstLight provides services to wholesale and enterprise businesses. They do not offer residential services. Their servies offerings include Metro Ethernet and Wavelength up to 10 Gbps, SONET services from DS1 up to OC192, and Fibre Channel. They also provide both dedicated symmetrical and asymmetrical Internet connections, legacy voice services that include SIP trunks, PRI/T1, traditional business lines, and audio conferencing. Colocation services are also available as well as Virtual PBX.

While they do not have fiber available throughout the entire AGC region, they will review any requests on a case by case basis to determine build out feasibility. FiberLight does not market dark fiber.

Internet Service Providers (ISPs)

Internet service providers (ISPs) are dependent on the last mile infrastructure of the providers. An ISP's service may or may not include the network connection. For instance, dial-up accounts to an ISP typically do not include the cost of the phone line, whereas a cable modem account does include the CATV service to the home or business. Internet service providers offer their services in one of two ways: by using wireline infrastructure such as telephone or cable TV, or by using wireless infrastructure such as towers and satellite.

A LEC that also offers an ISP service will provide both the physical network connection and Internet service. Many ISPs are not telephone or CATV companies and require that the customer connect to their site via some type of network circuit (telephone line, T1, DSL, etc.).

Internet speed (bandwidth) to an ISP is dictated by the infrastructure supporting the Internet connection. Regular telephone lines supporting a dial-up connection to an ISP have a maximum speed of 56Kbps. This is speed is insufficient for most applications. Customers within two to three miles of a telephone company's Central Office equipment or remote terminal can use digital subscriber lines (DSL) for Internet speeds between 128Kbps to 1.5Mbps. Higher bandwidth connections are available depending upon infrastructure availability in greater increments such as T1, frame relay, SONET, and Ethernet connections.

The below lists the ISPs that can provide service in the AGC region:

Internet Service Providers	
Local & Regional	**Telephone No.**
Verizon	(888) 225-6277
Frontier	(866) 844-6976
Windstream	(855) 852-9460
PrimeLink	(518) 203-3414
FirstLight	(518) 598-0900
Time Warner Cable	(518) 640-8574
Other Providers	**Telephone No.**
HughesNet	(866) 278-9707
LocalNet	(888) 488-7265
NetZero	(800) 638-9376

SECTION 4
WIRELESS COMMUNICATIONS

All wireless communications rely upon terrestrial based structures known as wireless towers to mount transmission and reception equipment. Two classifications of wireless communications exist: mobile and fixed. Both types of service utilize radio frequencies (RF) to transmit and receive signals through the air. Mobile wireless communications utilize bandwidth from 800MHz to 2,100MHz. This type of service is intended for the end user to be using a mobile or moveable receiving device, such as a cellular/mobile telephone. Mobile wireless services include: radio dispatch, paging, cellular telephone, digital telephone, Wi-Fi, and Internet services. Fixed wireless communications utilize radio frequencies (RF) from 1.5Ghz to 4.5GHz. Fixed wireless commonly uses microwaves for transmission of the signal. This type of service is intended for the end user to be at a fixed location, as service is designed to be a point-to-point or a point-to-multi-point configuration. Fixed wireless transmitters have to be positioned to have line-of-sight (or near line-of-sight) to the desired coverage area, in order to provide acceptable service. Fixed wireless services include, VoIP telephone, Wi-Fi, LAN, WAN, and Internet services. Mobile and fixed wireless solutions both have strengths that can contribute to the overall broadband coverage solution of an area.

4.1 Wireless Towers

To provide a generic definition of wireless towers, it is important to note that these locations are not always “towers,” but can be any structure that supports the RF equipment necessary to transmit and receive signals for wireless services. These structures can be buildings, water towers, high voltage transmission towers, utility poles, stadium light poles, and the list goes on.

In the early years of the wireless industry most wireless broadband carriers constructed, owned, and maintained their own wireless towers. Generally this resulted in one provider on one tower, which by today’s standards would seem wasteful and impractical, not to mention expensive. As the industry grew and the number of towers increased, the existence of third party wireless tower builders and owners came into dominance. By the mid 1990s the “real estate” business of building, owning and leasing space to the wireless providers became commonplace in the wireless industry. Companies like Crown Castle and American Towers began buying wireless towers across the country and renting space to multiple commercial wireless service providers on the same tower.

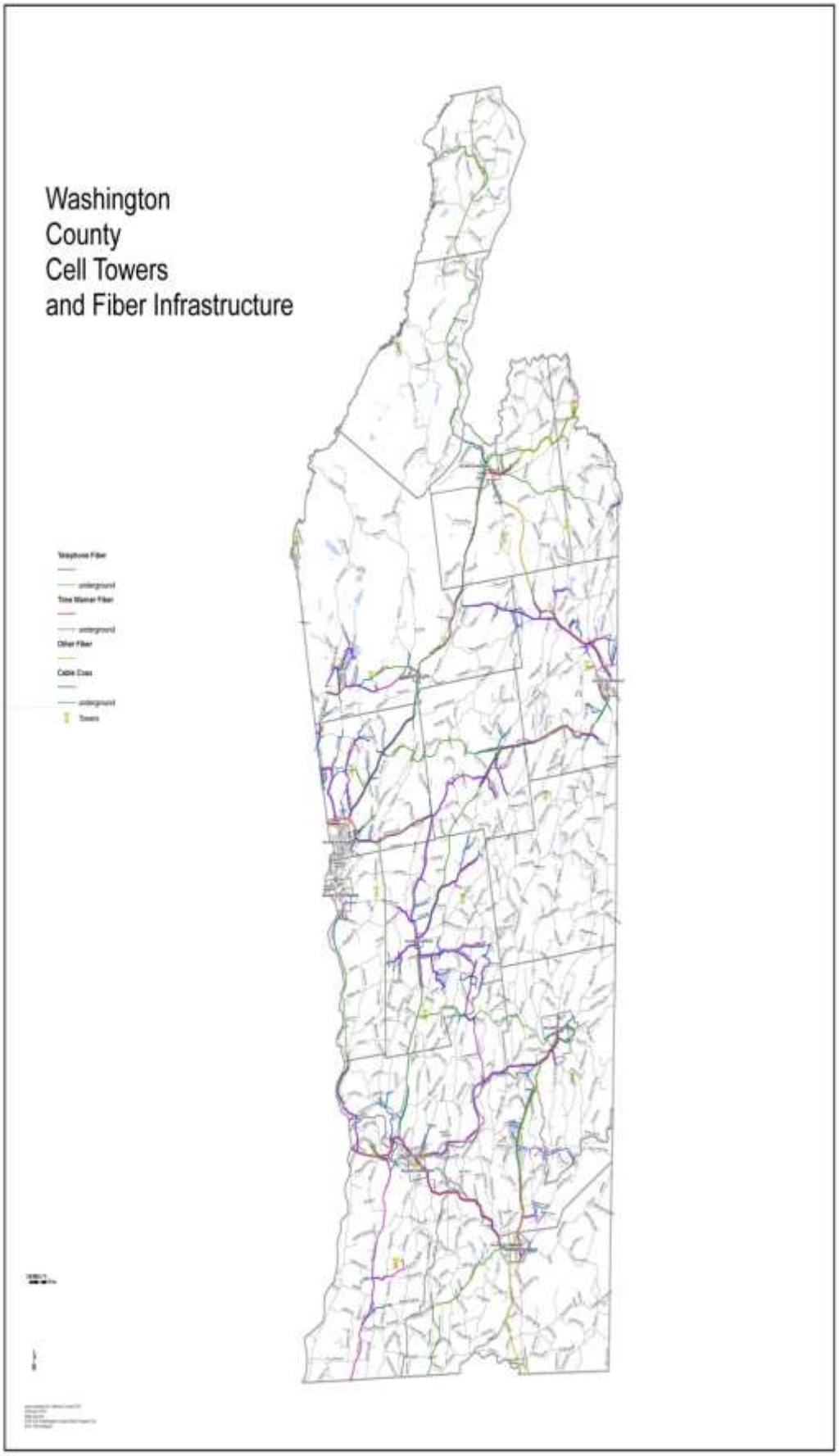
In the AGC region, ECC Technologies verified 52 wireless towers. The chart on the following page lists these sites, along with location address, latitude/longitude, and tower owner. The Warren County GIS Department has created a database of this information.

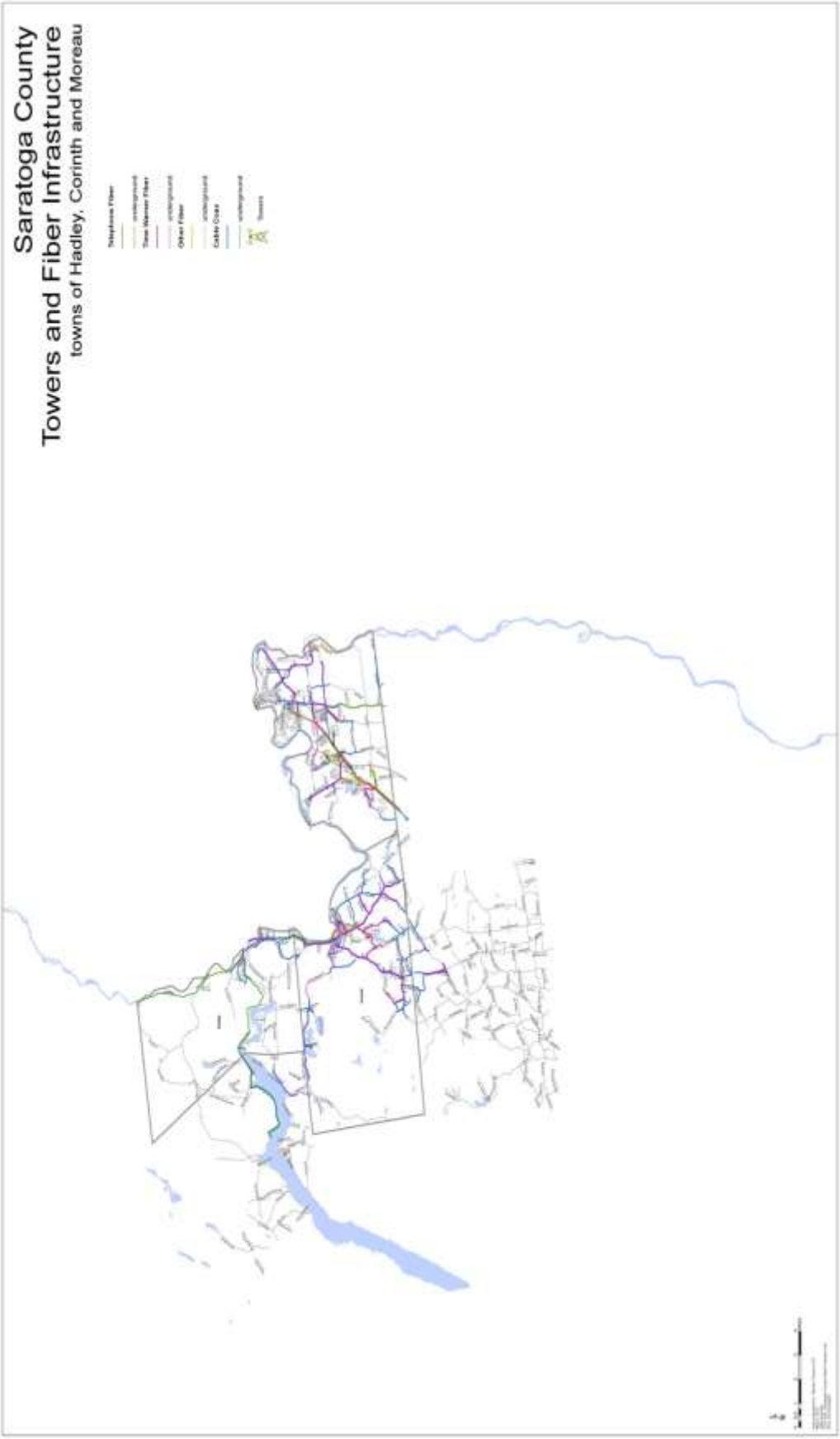
AGC Inventory Summary Report

#	Structure Owner	FCC Registration Number	Latitude	Longitiude	Structure Address	Structure City	Height AGL (ft)
1	Independent Towers, LLC	1273018	43.512694	73.739139	236 Wall Street	Bolton	29.6
2	Vox New York, LLC	1007712	43.244444	73.771111	2 MILES EAST OF CORINTH	Corinth	93.0
3	NEW CINGULAR WIRELESS PCS, LLC	1003994	43.293639	73.683583	BIG BAY RD	Glens Falls	90.8
4	CROWN ATLANTIC COMPANY, LLC	1009720	43.29025	73.679194	112 BIG BOOM ROAD	Glens Falls	59.4
5	Capital Media Corporation	1200269	43.304722	73.751389	4.4 mi. West of Glens Falls City limits	Glens Falls	68
6	Time Warner Cable Northeast LLC	1237300	43.316111	73.621944	227 Dix Avenue	Glens Falls	64.0
7	National Grid USA Service Company, Inc	1242730	43.320833	73.624	Quaker Road	Glens Falls	24
8	Better living radio	1240926	43.3095	73.644278	206 Glen St	Glens Falls	32.9
9	Northern Broadcasting Company, Inc.	1251165	43.308139	73.641778	Stichman Towers building, Jay Street	Glens Falls	50
10	National Grid Communications, Inc.	1252908	43.327	73.674694	Aviation Mall	Glens Falls	
11	BRADMARK BROADCASTING COMPANY	1009552	43.223056	73.740556	OLD SARATOGA RD 8.5 KM SW	Glens Falls	150
12	Florida Tower Partners, LLC DBA North Atlantic Tow	1274304	43.74575	73.520056	NY1037 Hague - 68 Decker Hill Road	Hague	33.5
13	Florida Tower Partners, LLC DBA North Atlantic Tow	1274534	43.690611	73.792278	NY1013 Horicon West - 3428 E Schroon Riv	Horicon	22.9
14	SpectraSite Communications, LLC. through America	1274805	43.633917	73.9225	NY1023 Wevertown - 2154 State Route 28	Johnsburg	35.1
15	Florida Tower Partners, LLC dba North Atlantic Tow	1277086	43.682222	73.976556	Route 28	Queensbury	36.6
16	SBA Properties, LLC	1222495	43.37275	73.692361	61 State Road 149	Queensbury	60.6
17	SpectraSite Communications, LLC. through America	1229352	43.324667	73.682944	1 Abbey Lane	Queensbury	33.5
18	Vox New York, LLC	1007713	43.377778	73.665	RT 149 1.7 MI E RT 9	Queensbury	93.6
19	BAY RIDGE VOLUNTEER FIRE COMPANY INC	1251855	43.398056	73.625	1400 RIDGE RD	Queensbury	18.2
20	6 Johnson Road Licenses, Inc.	1280797	43.329111	73.647889	89 Everts Avenue	Queensbury	56.7
21	Bay Ridge Rescue Squad	1064379	43.374444	73.627222	1109 Ridge Rd	Queensbury	15
22	Florida Tower Partners, LLC DBA North Atlantic Tow	1274303	43.767778	73.806944	200 Old Schroon Road	Schroon Lake	36.6
23	New York RSA 2 Cellular Partnetship	1210807	43.854444	73.7575	South St	Schroon Lake	35.1
24	Florida Tower Partners, LLC DBA North Atlantic Tow	1274924	43.559639	73.853028	NY1040 The Glen - 85 Huber Road	Thurman	39.6
25	Time Warner Cable Northeast LLC	1005868	43.421667	73.763611	BLACK SPRUCE MOUNTAIN	Warrensburg	42.7
26	Florida Tower Partners, LLC DBA North Atlantic Tow	1272357	43.599	73.722556	1792 East Schroon River Road	Warrensburg	30.5
27	American Towers, LLC.	1281519	43.420139	73.757778	Prospect Mountain (075069)	Warrensburg	32.6
28	Adirondack Two-Way Radio, Inc.	1211139	43.020056	73.524	WILLARD MOUNTAIN 1.5 MI NE OF	Easton	34.7
29	DBA DENNIS COMMUNICATIONS	1213944	43.020083	73.524167	SUMIT OF WILLARD MTN	Easton	45.7
30	Crown Atlantic Company LLC	1237380	43.020278	73.522389	Intervale Road	Easton	46
31	Washington, County of	1248517	43.019639	73.522972	Willard Mountain	Easton	30.4
32	Washington, County of	1248517	43.019639	73.522972	Willard Mountain	Easton	30.4
33	Armadillo Holdings Corporation	1007288	43.513333	73.305	2 MI SSE	East Whitehall	68.5
34	NEW CINGULAR WIRELESS PCS, LLC	1003993	43.415	73.543056	Goodman Rd	Fort Ann	78.9
35	SBA Towers, LLC	1216451	43.437	73.455389	Old Route 4	Fort Ann	79.2
36	SBA Properties, LLC	1214423	43.381694	73.601389	22 Wescott Ave.	Glens Falls	78.3
37	US Coast Guard Navigation Center	1259717	43.353333	73.54	96 ROUTE 42, Ft. Edward, NY, 12808-0000	Glens Falls	90.2
38	Washington County Office of Emergency Services	1005525	43.331944	73.338333	(NORTH HEBRON) BIG BIRCH HILL RD	Granville	77.7
39	SBA Properties, LLC	1245922	43.418444	73.286889	160 Mineral Hill Road	Granville	24.4
40	SBA Towers II LLC	1246732	43.096861	73.546833	330 Old Schuylerville Rd	Greenwich	48.2
41	Time Warner Cable Northeast LLC	1247074	43.095861	73.487278	Prospect Street and Sloan Road	Greenwich	56.1
42	Cellco Partnership	1263827	43.093417	73.487944	13 Prospect Street	Greenwich	31.9
43	Batten Kill Railroad Company, Inc	1286149	43.08675	73.49875	1 Elbow Street	Greenwich	20
44	CROWN COMMUNICATION LLC	1228026	43.589667	73.297306	Golf Course Road	Hampton	51.8
45	Florida Tower Partners, LLC DBA North Atlantic Tow	1274302	43.636	73.504639	NY1017 - 1 Deer Run Way	Huletts Landing	33.5
46	SBA 2012 TC Assets, LLC	1270488	43.507028	73.628722	1684 Pilot Knob Road	Kattskill Bay	34.7
47	CROWN ATLANTIC COMPANY, LLC	1009601	43.352306	73.567611	UNDERWOOD RD	Kingsbury	58.5
48	Northeast Mountain Radio	1213917	43.263944	73.437889	TODD MOUNTAIN	North Argyle	21.3
49	Tower Development Corporation	1267508	43.186667	73.484389	28 Coach Road	North Argyle	79.6
50	CROWN ATLANTIC COMPANY, LLC	1009599	43.141333	73.312361	RICH HILL RD	Shushan	80.5
51	SBC TOWER HOLDINGS LLC	1009126	43.505556	73.381944	DICK HYATT RD	Whitehall	89.6
52	CROWN ATLANTIC COMPANY, LLC	1014197	43.505361	73.381889	DICK HYATT RD	Whitehall	81.9

The following maps shows the wireless tower locations in the region, as verified by ECC. The yellow tower symbols represent wireless tower locations. There is one map per county.

Warren County Towers and Fiber Infrastructure


Washington
County
Cell Towers
and Fiber Infrastructure


Saratoga County
Towers and Fiber Infrastructure
towns of Hadley, Corinth and Moreau

As previously mentioned, the tower owners lease space on their respective towers to wireless service providers. The wireless service providers house broadband and power equipment within the tower compound and mount RF panels, antennae, and other transmission equipment on the tower structure. A list of major tower owners and the number of towers owned in AGC that ECC found during the field survey is shown in the following chart.

The following chart includes wireless tower owners and contact information.

Wireless Tower Owners	
American Towers, (3 towers) Regulatory Compliance 10 Presidential Way Woburn, Ma. (678) 265-6770	**New Cingular Wireless PCS, LLC (3 towers)** Reginald Youngblood 5601 Legacy Drive MS A-3 Plano, TX 75024 (469) 229-7471
Florida Tower Partners (7 towers) Curtis L. Miller 1001 3rd Ave W Bradenton, Fl 34205 (941) 757-5010	**SBA Properties (6 Towers)** Edward G. Roach 5900 Broken Sound Parkway NW Boca Raton, FL 33487 (561) 995-7670
Crown Atlantic Company (6 towers) Monica Gambino 2000 Corporate Drive Canonsburg, PA 15317 (724) 416-2000	

4.2 Mobile Wireless Communications

Commercial mobile wireless communications is one of the fastest growing and most commonly used forms of communication. The convenience of having a mobile wireless device, a cell phone that provides communication connectivity in multiple locations, is a personal utility that cannot be duplicated by the wireline industry. According to CTIA, a wireless industry association, estimates of the number of wireless subscriber connections is over 320 million in the U.S. today and growing. In 2011 the number of cell phones in use exceeded the number of wireline telephones in use today. This migration to the mobile wireless industry from wireline companies such as the ILECs in the region is particularly pronounced in the residential telephone sector. The trend nationwide aggravated by a poor economy is resulting in the replacement of the family's home residential telephone with a cell phone for each family member, and while current statistics are not available estimates suggest a loss of wireline telephone service to wireless telephone service at approximately 4.5% per year.

But there are drawbacks in migrating completely to wireless service. With commercial mobile wireless service, even basic service offerings can be expensive. Costs vary considerably based upon the type of package a user subscribes to, the services an individual is willing to pay for, and discounts. But in the end, most commercial mobile wireless users pay more for the convenience of

being able to make and answer a call in more than one location. An additional drawback is depending upon a caller's proximity to the nearest cell tower, and the quality of wireless service is generally considered to be not as good as wireline service for three reasons.

First, wireless communications are a radio transmission/reception and radio signals are affected by atmospheric conditions, including dense fog and rain. Second, physical obstructions such as buildings, mountains, and forest coverage can block a radio signal. Third, wireless communications is not a duplex technology like traditional wireline service. It is one way, for both transmit and receive, which is why it is difficult sometimes for two people to speak and be heard without talking over each other.

The cellular industry is in the midst of a national competitive upgrade to increase the speed of service to wireless subscribers. From a device perspective, most wireless phones being sold on today's market are voice and data devices. They have key pads or touch screens that facilitate texting. It is difficult to find a voice only flip cell phone so popular just a few years ago. These older voice only cell phones are being largely relegated to the pre-paid cellular market. The new voice and data devices provide connectivity to the World Wide Web and there now exists a surprising number of applications (apps) to various Internet services. This connectivity is provided by a mobile commercial wireless provider generally at a speed known as 3G.

Mobile Wireless Service Providers

The mobile wireless providers in the region are Verizon Wireless, Sprint, AT&T, and Cricket Wireless. All of these mobile wireless providers have transmission equipment on towers, strategically placed in the area to provide mobile wireless service to the maximum number of customers. Not surprisingly, the majority of investment in cellular-based infrastructure is located in and around the I-87 corridor. The two companies that represent most of the commercial mobile wireless in AGC are AT&T Mobility and Verizon Wireless. The other providers furnish services on a smaller scale.

Generally speaking, the mobile wireless providers in AGC are providing 3G wireless services. 3G can provide broadband bandwidth of 200KBps to 1MBps to mobile users, which again is insufficient for some Internet applications. (3G is the third generation of cellular technology, with analog being the first and digital being the second). 4G service is currently being rolled out across the country with the major cities being the first to get this type of service. Verizon Wireless 4G LTE can provide up to 12Mbps to the end user. The eventual rollout of 4G wireless services by cellular providers will have a positive impact on broadband deployment in the footprints they cover.

Because of this increase in transmission speed to end users, the high speed backhaul connections to cell towers are also changing from wire and cable based to fiber optic based connections. 3G can effectively operate using a 20Mbps backhaul circuit. 4G wireless service requires 200Mbps of backhaul connectivity to accommodate the increased speeds. Fiber optic cable provides the only foundation capable of supporting this level of bandwidth for today and future generations of faster wireless technologies. While 4G may be appropriate for most residential and individual consumers, generally the speeds required by most business customers, particularly those with multiple employees, is not well suited for a commercial enterprise.

AT&T Wireless

AT&T Wireless is headquartered in Dallas, Texas and has over 95 million wireless subscribers nationwide. AT&T is one of the nation's largest commercial mobile wireless providers and has nearly 27,000 Wi-Fi hotspots around the country.

The closest AT&T store supporting the AGC region is located at 74 Quaker Rd, in Queensbury, NY. There is not a business office in the area. According to their website, they have voice service throughout the region with their best coverage along the I-87 corridor. As for data service, AT&T can provide 4G data service in the populated areas of the region, again along the I-87 corridor, including Glens Falls, Queensbury, and Lake George. The rest of the County where AT&T wireless service is available enjoys 3G Enhanced Data rates for GSM Evolution, with typical speeds of 75 to 135Kbps in certain areas. AT&T Wireless has a data service called DataConnect Pass that allows laptops or netbooks with an aircard/connect card the ability to connect to AT&T's wireless network. AT&T Mobility has been identified on seven cellular towers in the area.

AT&T has acquired radio spectrum through more than 40 negotiated agreements this year (some pending regulatory review) and has plans to buy additional wireless spectrum to support its 4G LTE network. Much of the additional spectrum came from an innovative solution in which AT&T gained FCC approval to use WCS spectrum for mobile broadband. Between what the company already owns and transactions pending regulatory approval, AT&T expects to have about 118MHz of spectrum nationwide. The company has announced they will continue to advocate with the FCC for release of additional spectrum for the industry's long-term needs.

In addition to all the above and as part of Project VIP, AT&T expects to deploy small cell technology, macro cells, and additional distributed antenna systems to increase the density of its wireless network, which is expected to further improve network quality and increase spectrum efficiency.

Sprint Nextel

Sprint's corporate headquarters are located in Overland Park, Kansas. They do not have an office presence in the Adironadacks. Sprint Nextel offers wireless services to consumer, business, and government customers. Sprint Nextel operates two separate wireless networks: one for conventional cellular service and the other for their walkie-talkie service. Sprint is also a Tier 1 Internet provider, which means they wholesale or supply other service providers with Internet access.

Sprint offers digital voice, Nextel Direct Connect (walkie-talkie), and wireless data services. Sprint 3G On Network offers 600Kbps to 1.4Mbps or 350Kbps to 500Kbps and the Nationwide Sprint Network offers 50Kbps to 70Kbps. According to their website, Sprint has On Network coverage primarily in the towns along I-87: Glens Falls, Queensbury, and Lake George.

Verizon Wireless

Verizon Wireless offers service to businesses and residents in the AGC area. Verizon Wireless is the leading wireless provider in the area. In the metro areas 4G LTE service is widely available, which provides the fastest access available to Verizon's high speed wireless Internet service, real-time e-mail, and entertainment services.

The closest Verizon Wireless retail stores are at 756 Upper Glen St. in Queensbury and 3062 Route 50 in Saratoga Springs. There is not a Verizon Wireless corporate business office in the area.

Mobile Wireless Costs and Contacts

Pricing for commercial wireless service varies greatly depending on the type of service (voice, data) and level of technology used (3G, 4G), the discount plan, and the commitment timeline. Each provider's website has pricing matrixes that show multitudes of plans and service levels for individual customers and businesses. In an effort to minimize network bottleneck, many of the cellular providers are going from unlimited plans to a capped monthly data service to limit the bandwidth used.

The following chart provides a list of mobile wireless service providers along with sales contact information for each that ECC Technologies identified in the AGC area.

Mobile Wireless Service Providers' Contacts		
Company	**Contact**	**Phone Number**
AT&T Mobility	Domenico Cimmino	(518) 792-4700
Verizon Wireless	Todd Danforth	(518) 615-0778
Sprint/Nextel	Sales	(518) 798-6282
Cricket Wireless	Sales	(888) 235-3993
T-Mobile	Brian Reilley	(215) 990-1955

4.3 Fixed Wireless Communications

Fixed wireless service providers are commonly called Wireless Internet Service Providers (WISPs). WISPs offer Wi-Fi broadband technology utilized in the 900MHz, 2.4GHz, and 5GHz unlicensed radio frequency bands developed under and in compliance with the 802.11 international standard. WISPs tend to be thought of as the most cost effective technology for serving rural unserved and underserved markets, particularly when the terrain is mountainous and/or the cost of building out last mile fiber optic infrastructure is prohibitively expensive. Commercial off the shelf (COTS) products are available at reasonable prices. The technology is well developed to provide a high level of service. The cost of entry into the market using these technologies is not on the order or magnitude seen by the cellular broadband carriers, and may be incrementally implemented. All these factors combine to make a WISP a preferable option in many circumstances.

Fixed wireless technologies require wireless access points (APs), which can be located on radio towers, tall buildings, utility poles, or other high structures. Remote households receiving broadband service will require a roof mounted antenna that will feed an indoor modem. Internet service will then be available at the modem, and can be redistributed to an in-home wired or wireless network. The cost of a Wi-Fi access point may be as low as $5,000 and Customer Premises Equipment (CPE) as low as $200.

Successful system configuration is dependent upon the WISP having access to tall structures, at least above treetop level. These structures can be cellular or other radio towers, utility electrical transmission towers, water tanks, or multi-story buildings.

WISPs can be an attractive alternative to traditional landline services. In many cases, customers of WISPs can avoid very costly landline builds, resulting in more affordable bandwidth. WISPs fill the void in unserved and underserved areas, supplying reliable connectivity using their fixed point-to-point and point-to-multi-point microwave network.

There is one Primary WISP in the AGC area, Hudson Valley Wireless.

Hudson Valley Wireless

Hudson Valley Wireless was created to deliver high speed internet services to rural areas in upstate New York. Their deployments focus on areas that do not have access to cable or DSL. They are upstate New York's largest WISP, delivering last mile and middle mile connectivity to subscribers in rural and remote villages and townships. They are continually expanding their coverage to unserved and underserved markets by partnering with local communities.

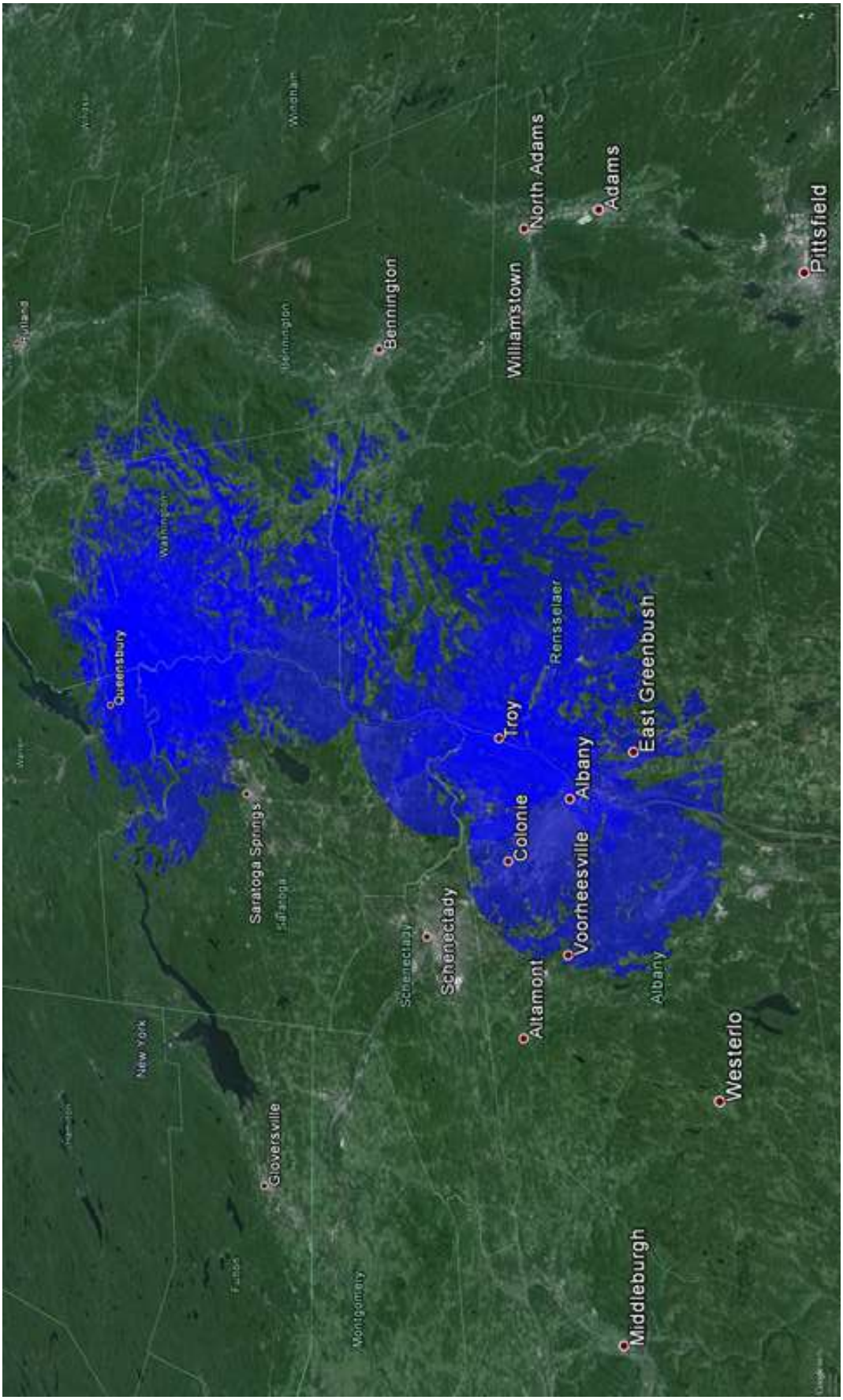
Their broadband platform has the product name of Nitro. They have two different types of service offerings, the basic service is 6MBPS upload and 1.5Mbps download. The higher service offering is 10mg upload to 2mg download. Basic service starts at $40 per month.

In the AGC area they currently provide service from Queesnbury to Corinth and also the northeastern part of Washington County. In conjunction with this study, they are currently working on an expansion project that will provide additional service to parts of Warren and Washington County.

Mobile Wireless Service Providers' Contacts		
Company	**Contact**	**Phone Number**
Hudson Valley Wireless	Jason Guzzo	(518) 379-9470

Fixed Wireless Coverage

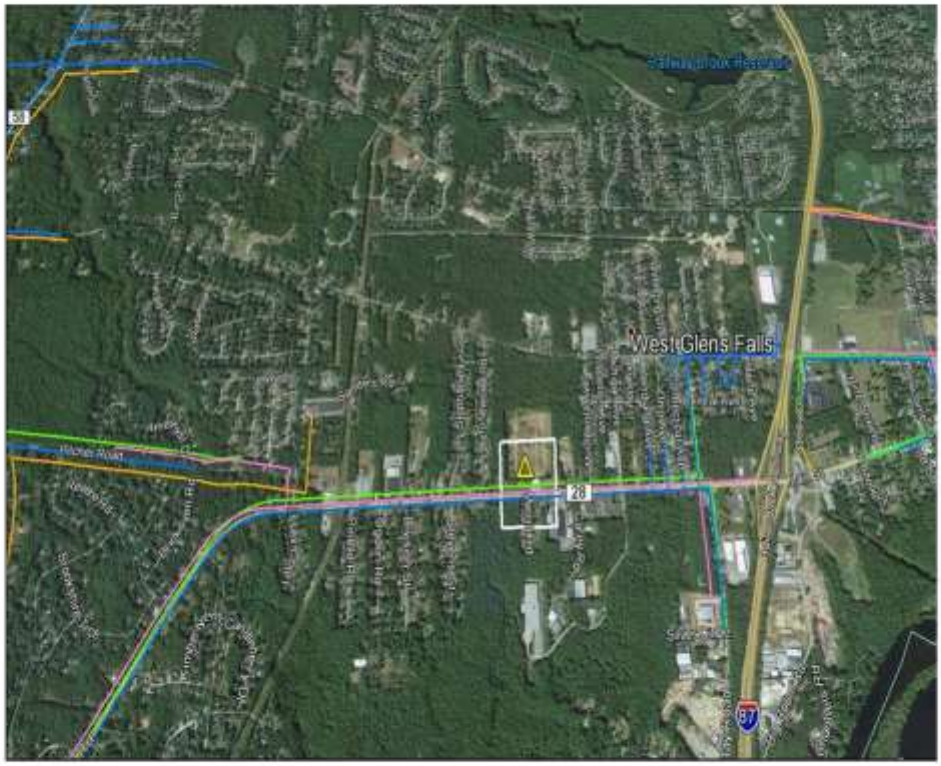
The blue shaded areas in the map on the next page depict fixed wireless coverage.


Queensbury
Saratoga Springs
Gloversville
Middleburgh
Schenectady
Altamont
Colonie
Troy
Voorheesville
Albany
East Greenbush
Westerlo
Bennington
Williamstown
North Adams
Adams
Pittsfield

SECTION 5
ECONOMIC DEVELOPMENT SITES

ADIRONDACK GATEWAY COUNCIL

Carey Industrial Park



Carey Industrial Park: Corinth Road Queensbury, NY 12801

Telecom Infrastructure Near Site

- Verizon is the Incumbent Local Exchange Carrier (ILEC). Verizon has aerial fiber along route 28 / Corinth Rd., which runs in front of the site from the Southeast along Route 58 / Corinth Rd.
- Time Warner Cable provides CATV service in the area, as well as, broad-band services. TW has fiber to the West, East and Southeast of the site. The fiber runs along route 28 coming from route 58 which are both also known as Corinth Rd. The fiber also runs on Pitcher Rd and Big Bay Rd.
- Time Warner also has coax cable that runs in front of the site along the same routes as their fiber.
- Fiber Light formerly known as Tech Valley Communications has fiber that runs from the north up route 58 / Corinth Rd then heads east on Pitcher Rd. To Vandusen Rd. Fiber Light's fiber is within a 1/3 of a mile of the site.

Legend

- Tel Fiber
- CATV Fiber
- Other Fiber
- CATV
- Site Boundary

ECC TECHNOLOGIES

ADIRONDACK GATEWAY COUNCIL

Carey Industrial Park
Telecom Focus Site

Fiber Availability/Services at Site

Approximate distance to the nearest fiber infrastructure by owner is illustrated in the chart to the right. Verizon has fiber that runs directly by the site. Fiber Light has fiber within a 1/3 of a mile to the northwest of the site. Windstream has fiber within a mile of the site. All three can provide high bandwidth services.

Fiber Owner	Distance from Site
Verizon	At site
Fiber Light	.33 mi
Windstream	approx. 1 mi

Fiber Diversity and Redundancy

Redundancy and diversity can be achieved through multiple providers. A combination of the providers listed abover will allow diverse fiber access from three directions to this location. Both Fiber Light and Windstream would require short builds to reach the site. Fiber could be constructed either underground or aerially. An underground build would create diversity at the physical level. Fiber diversity would require additional network investment.

Competitive Services

Time Warner can provide coax and fiber services to this site.

Verizon can provide data services from T-1 up to 10 Gigabit MPLS.

Windstream can provide T-1 service from 1.5 to 3 mg. Speeds over 3 mg would require a build.

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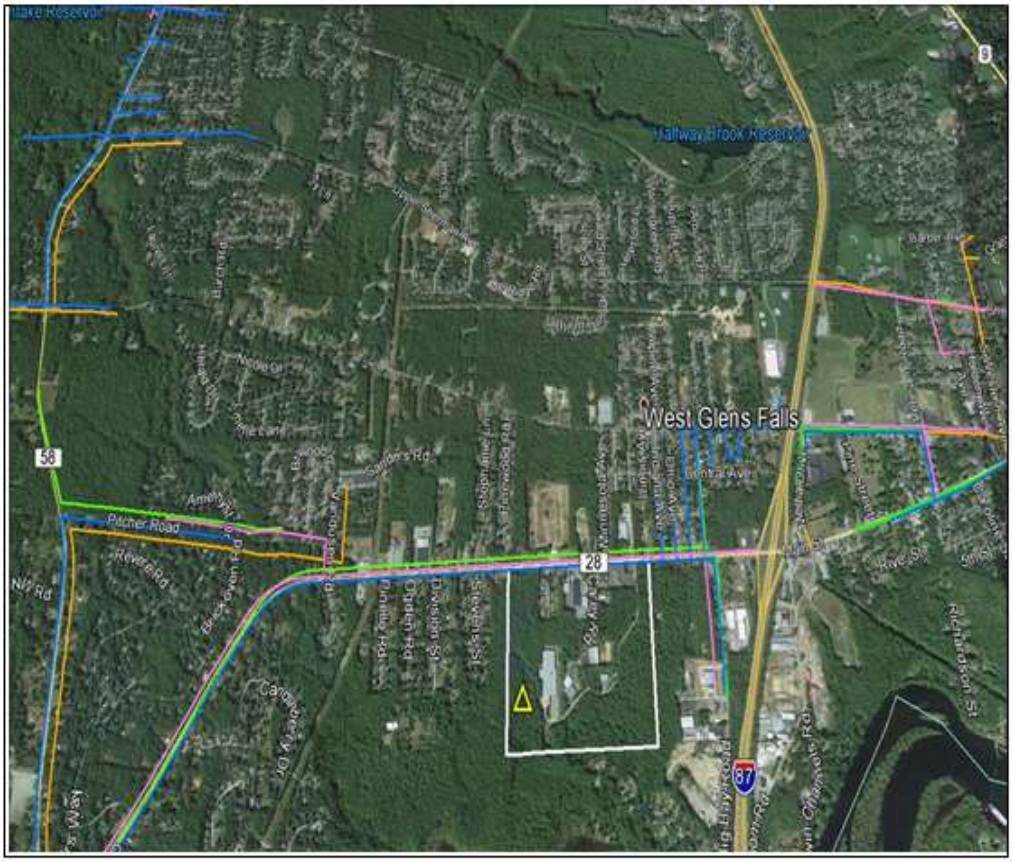
ECC TECHNOLOGIES

ADIRONDACK GATEWAY COUNCIL

Former Native Textile Building



Former Native Textile Building: 1 Native DrQueensbury, NY 12804

Telecom Infrastructure Near Site

- .Verizon is the Incumbent Local Exchange Carrier (ILEC). Verizon has aerial fiber along route 28 / Corinth Rd., which runs in front of the site from the Southeast along Route 58 / Corinth Rd and heads North on Road Island Avenue.
- Time Warner Cable provides CATV service in the area, as well as, broadband services. TW has fiber to the West, East and Southeast of the site. The fiber runs along route 28 coming from route 58 which are both also known as Corinth Rd. The fiber also runs on Pitcher Rd and Big Bay Rd.
- Time Warner also has coax cable that runs in front of the site along the same routes as their fiber.
- Primelink has fiber on the street as well. An underground build to access the facility would be required.

Legend

- Tel Fiber
- CATV Fiber
- Other Fiber
- CATV
- Site Boundary

ECC TECHNOLOGIES

ADIRONDACK GATEWAY COUNCIL

Former Native Textile Building
Telecom Focus Site

Fiber Availability/Services at Site

Approximate distance to the nearest fiber infrastructure by owner is illustrated in the chart to the right. Verizon has fiber that runs directly by the site. TW Cable also has fiber that runs directly by the site. Primelink has fiber within a 1/3 of a mile to the northwest of the site.

Fiber Owner	Distance from Site
Verizon	At site
TW Cable	At site
Primelink	.33 mi

Fiber Diversity and Redundancy

Redundancy and diversity can be achieved through multiple providers. A combination of the providers listed above will allow diverse fiber access from three directions to this location. Primelink would require a short underground build to reach the site. An underground build would create diversity at the physical level. Fiber diversity would require additional network investment.

Competitive Services

Time Warner can provide coax and fiber services to this site.

Verizon can provide data services from T-1 up to 10 Gigabit MPLS.

Primelink can provide data services

Although Windstream does not have fiber in the area they can provide T-1 service from 1.5 to 3 mg. Speeds over 3 mg would require a build.

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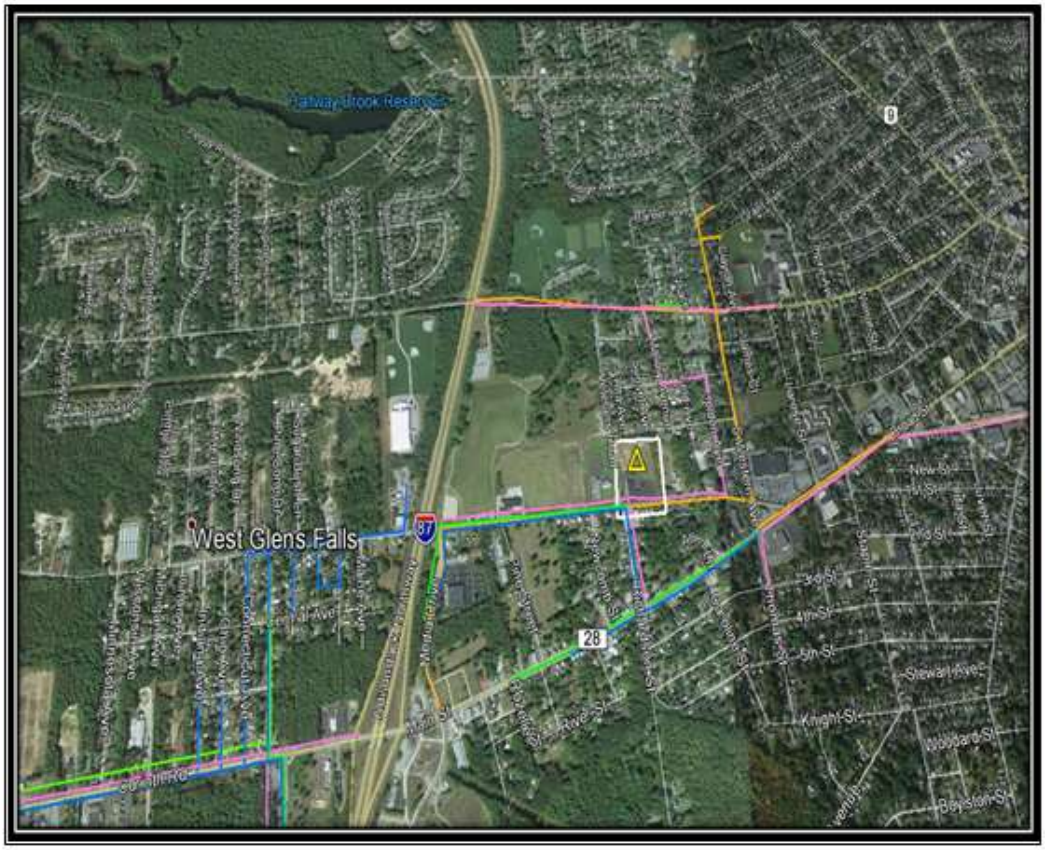
ECC TECHNOLOGIES

ADIRONDACK GATEWAY COUNCIL

Tech Meadows Business Park



Tech Meadows Business Park: Luzerne Rd & Veterans Rd Glens Falls, NY 12801

Telecom Infrastructure Near Site

- Verizon is the ILEC for this location. They have fiber on the street running directly in front of the building. TAhe fiber path starts on Media Dr and runs north to Luzerne where it heads east. There is also fiber running parallel to Luzerne Rd on Sherman Ave.
- TW Cable is the cable provider in the area and they also have fiber on the street. The fiber begins at the intersection of Media Dr and Luzerne heading east. It then heads north up Holden Ave to Nathan St and Mallory Ave. TW also has fiber which runs parallel to Luzerne along Sherman Ave and Upper Sherman Ave.
- Primelink is the third provider with fiber directly in front of the location. Primelink's fiber comes from Main St, heading North on Media Dr. to Luzerne heading east. It then splits and heads North on S. Western Ave and continues Northeast on Broad St. Primelink also has fiber on Sherman Ave and Upper Sherman Ave which runs parallel to Luzerne.

Legend

- Tel Fiber
- CATV Fiber
- Other Fiber
- CATV
- Site Boundary

ECC TECHNOLOGIES

ADIRONDACK GATEWAY COUNCIL

Tech Meadows Business Park
Telecom Focus Site

Fiber Availability/Services at Site

Approximate distance to the nearest fiber infrastructure by owner is illustrated in the chart to the right. Verizon has fiber that runs directly by the site. TW Cable also has fiber that runs directly by the site. Primelink has fiber within a 1/3 of a mile to the northwest of the site.

Fiber Owner	Distance from Site
Verizon	On street
Time Warner Cable	On street
Primelink	On street

Fiber Diversity and Redundancy

Redundancy and diversity can be achieved through multiple providers. A combination of the providers listed above will allow diverse fiber access from three directions to this location. Primelink would require a short underground build to reach the site. An underground build would create diversity at the physical level. Fiber diversity would require additional network investment.

Competitive Services

Time Warner can provide coax and fiber services to this site.

Verizon can provide data services from T-1 up to 10 Gigabit MPLS.

Primelink can provide data services

Although Windstream does not have fiber in the area they can provide T-1 service from 1.5 to 3 mg. Speeds over 3 mg would require a build.

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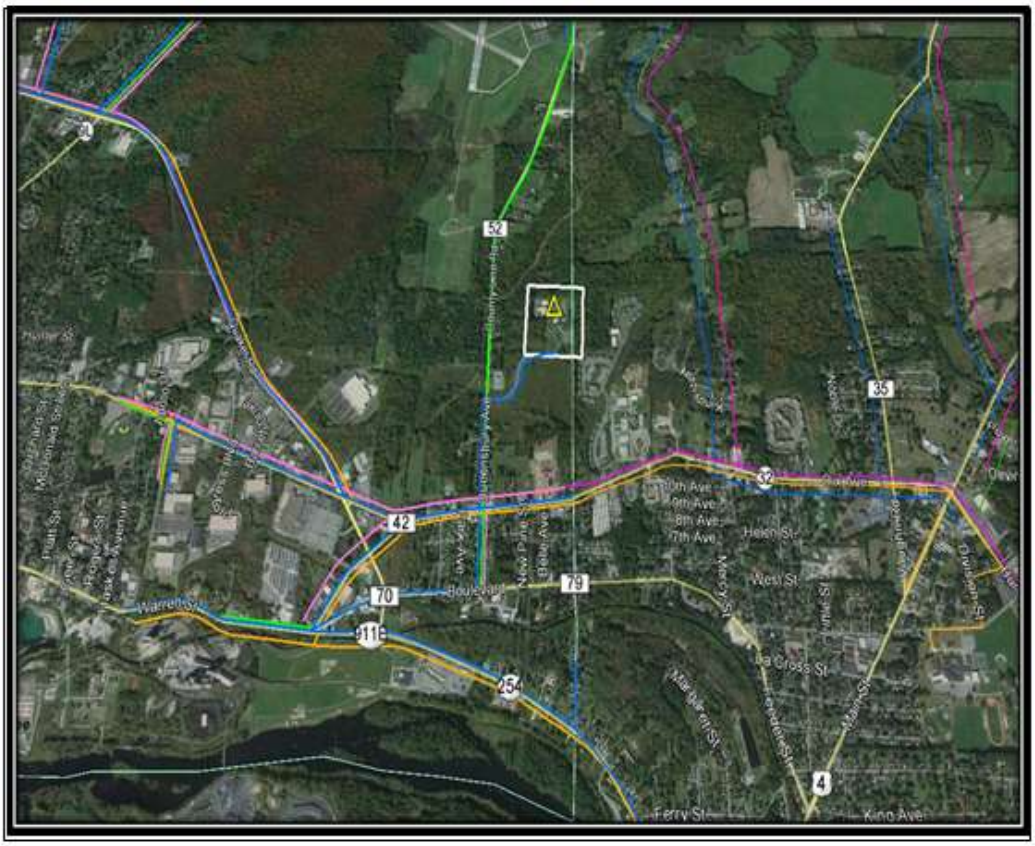
ECC TECHNOLOGIES

ADIRONDACK GATEWAY COUNCIL

Queensbury Business Park



Queensbury Business Park: Queensbury, NY 12804

Telecom Infrastructure Near Site

- Verizon is the ILEC in Queensbury, NY. Verizon has fiber that runs in front of the location on County Line Rd. The fiber would need to be extended approximately .33 mile to reach the building.
- Time Warner Cable has fiber within a 1/2 mile of the site. The fiber comes from 3 different directions. The first route follows Quaker Rd aerially and then joins with additional fiber at the intersection of Quaker and Dix Rd. A 3rd aerial route comes down Highland Ave and converges with the other fiber at Quaker and Dix Rd. The fiber would need to be extended down Queensbury Ave and on to StoneQuarry Rd to reach the site. However, TW does have coax cable that runs directly to the building.
- Primelink has fiber within a short distance of the site. Primelink's fiber follows the same route as Time Warner's fiber and like TW is within a 1/2 mile of the site. Primelink plans to extend their fiber to the location in the near future.
- Firstlight also has fiber within a mile of the location.

Legend

- Tel Fiber
- CATV Fiber
- Other Fiber
- CATV
- Site Boundary

ECC TECHNOLOGIES

ADIRONDACK GATEWAY COUNCIL

Queensbury Business Park Telecom Focus Site

Fiber Availability/Services at Site

Approximate distance to the nearest fiber infrastructure by owner is illustrated in the chart to the right. Verizon has fiber that runs in front of the street, however because the location is set off the road, the fiber would need to be extended approximately 1/3 of a mile to reach the buildings. Time Warner Cable has fiber within a 1/2 mile of the site as does Primelink. Primelink plans to construct to the site in the near future. Fiberlight has fiber within a mile of the site.

Fiber Owner	Distance from Site
Verizon	.33 mi
Time Warner Cable	.50 mi
Primelink	.50 mi
First Light	Within a mile

Fiber Diversity and Redundancy

There are 4 providers that have fiber within close proximity to the site. Fiber diversity and redundancy could be achieved by using multiple providers.

Competitive Services

Verizon is the ILEC in the region and can provide data services from T-1 up to 10 Gigabit MPLS.

Time Warner and First Light are within close proximity to the site but a short build would be required to bring service to it.

Windstream can provide T-1 service from 1.5 to 3 mg. Speeds over 3 mg would require a build.

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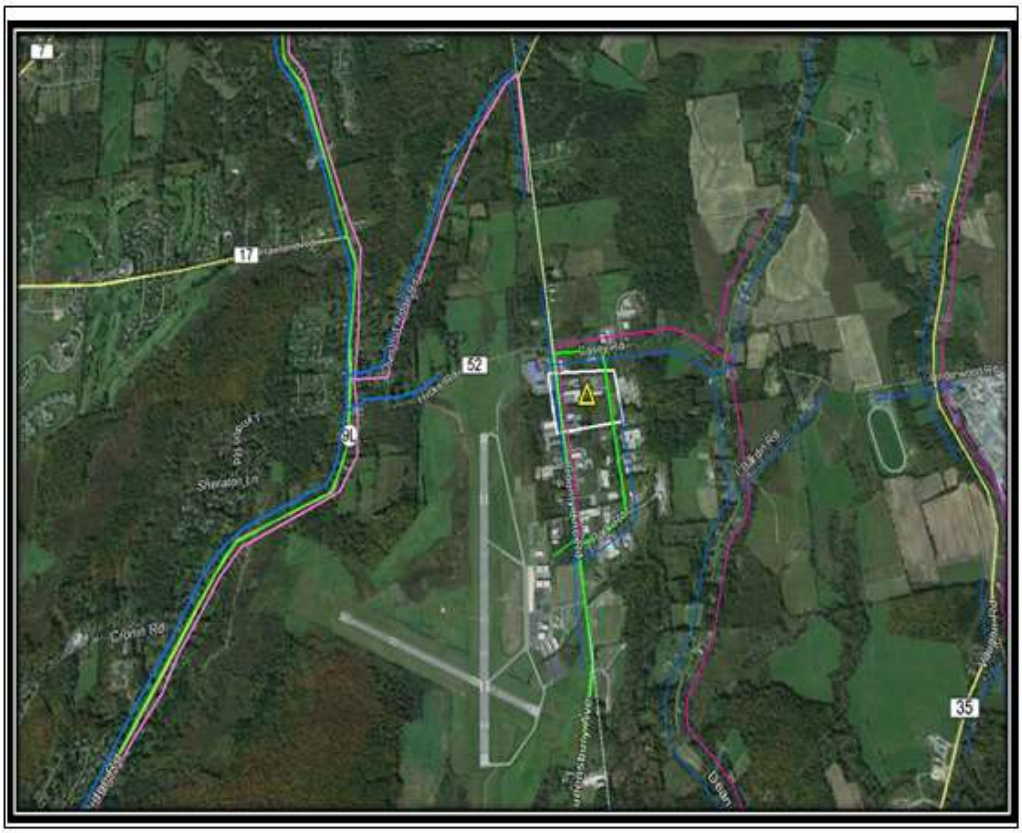
ECC TECHNOLOGIES

ADIRONDACK GATEWAY COUNCIL

IDA/Airport Park



IDA/Airport Park: Casey Road / Ferguson Lane Queensbury, NY 12804

Telecom Infrastructure Near Site

- Verizon is the ILEC and has fiber running in all directions around the site. The fiber comes north down County Line Rd and turns east on Casey Rd, then heads South on Park Rd and meets County Line Rd again. Essentially forming a square around the site.
- TW has fiber that runs by the site coming in from the north on County Line Rd and heading east on Casey Rd., the fiber then splits and heads both north and south on Dean Rd.
- TW also has coax that runs by the site which mirrors the fiber. The coax also runs behind the site on Casey Rd.

Legend

- Tel Fiber
- CATV Fiber
- Other Fiber
- CATV
- Site Boundary

ECC TECHNOLOGIES

ADIRONDACK GATEWAY COUNCIL

IDA/Airport Park
Telecom Focus Site

Fiber Availability/Services at Site

Approximate distance to the nearest fiber infrastructure by owner is illustrated in the chart to the right. Verizon has fiber that runs directly by the site. TW Cable also has fiber that runs directly by the site. Primelink does not currently have fiber near the site but has plans to construct it in the near future.

Fiber Owner	Distance from Site
Verizon	At site
TW Cable	At site
Primelink	Plans to construct

Fiber Diversity and Redundancy

Redundancy and diversity can be achieved through multiple providers. A combination of the providers listed above will allow diverse fiber access from three directions to this location.

Competitive Services

Time Warner can provide coax and fiber services to this site.

Verizon can provide data services from T-1 up to 10 Gigabit MPLS.

Although Windstream does not have fiber in the area they can provide T-1 service from 1.5 to 3 mg. Speeds over 3 mg would require a build.

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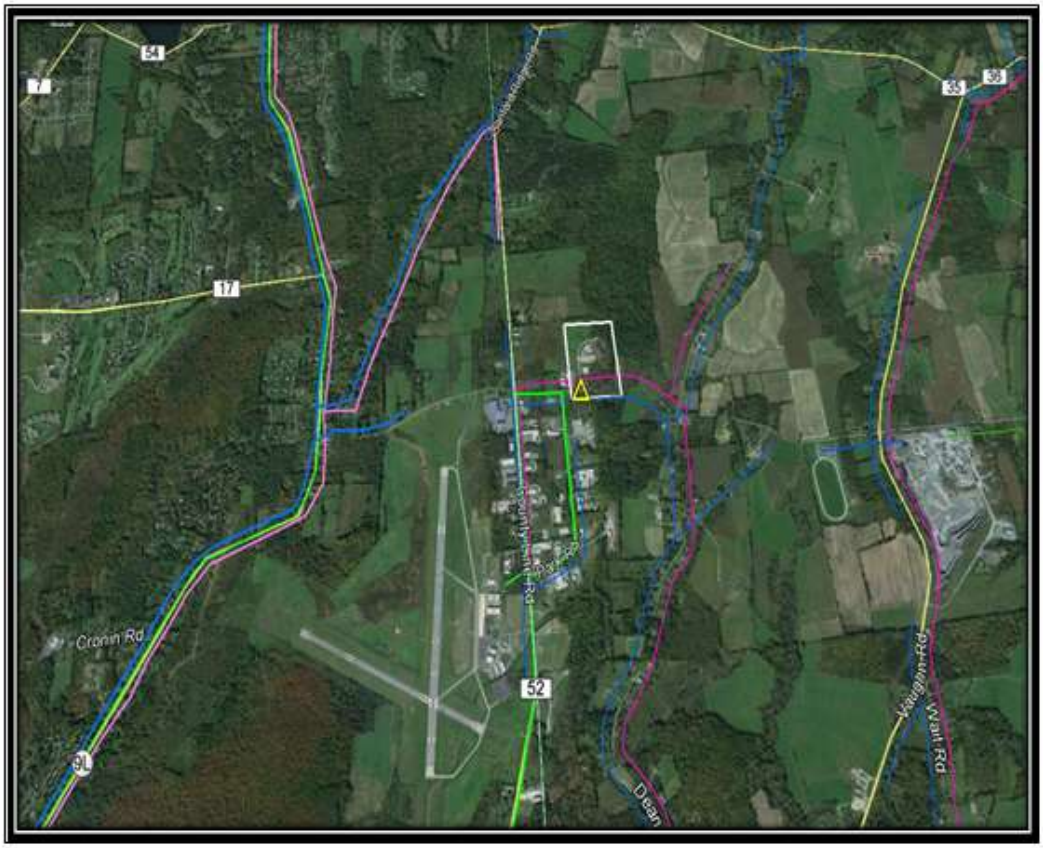
ECC TECHNOLOGIES

ADIRONDACK GATEWAY COUNCIL

Airport Industrial Park



Airport Industrial Park: Casey Rd / Ferguson Ln Queensbury, NY 12804

Telecom Infrastructure Near Site

- Verizon is the ILEC for this site and has fiber that is within a 1/4 mile of the site. The fiber runs east from Casey Rd and heads south on Park Rd. A short build would be required to bring the fiber from Casey Rd up to Ferguson Ln.
- Time Warner is the cable provider in the area and they have fiber that runs down Casey Rd directly in front of the site. A short build would be required to extend the fiber up Ferguson Ln.
- Time Warner also has coax that runs directly by the site that follows the same path as their fiber.

Legend

- Tel Fiber
- CATV Fiber
- Other Fiber
- CATV
- Site Boundary

ECC TECHNOLOGIES

ADIRONDACK GATEWAY COUNCIL

Airport Industrial Park Telecom Focus Site

Fiber Availability/Services at Site

Approximate distance to the nearest fiber infrastructure by owner is illustrated in the chart to the right. TW Cable has fiber that runs directly by the site. Verizon has fiber that runs within a 1/4 mile of the site. Primelink does not currently have fiber near the site but has plans to construct it in the near future.

Fiber Owner	Distance from Site
TW Cable	By site
Verizon	.25 mi

Fiber Diversity and Redundancy

Redundancy and diversity can be achieved through multiple providers. A combination of the providers listed above will allow diverse fiber access from three directions to this location.

Competitive Services

Time Warner can provide coax and fiber services to this site.

Verizon can provide data services from T-1 up to 10 Gigabit MPLS.

Although Windstream does not have fiber in the area they can provide T-1 service from 1.5 to 3 mg. Speeds over 3 mg would require a build.

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ECC TECHNOLOGIES

ADIRONDACK GATEWAY COUNCIL

Chester Industrial Park

Chester Industrial Park: Route 9 Chestertown NY 12817

Telecom Infrastructure Near Site

- Time Warner Cable provides CATV service in the region. TW has aerial fiber along route 9 / Main St.. The fiber runs directly in front of the site. Thee fiber runs east on route 5 and then follows along route 9 past route 8.
- Time Warner also has COAX cable that runs along the same route.
- Frontier Communications / Citizens is the ILEC provider in this region. Frontier does not have fiber to this site but will provide business service on a case by case basis.

Legend

- Tel Fiber
- CATV Fiber
- Other Fiber
- CATV
- Site Boundary

ECC TECHNOLOGIES

ADIRONDACK GATEWAY COUNCIL

Chester Industrial Park **Telecom**
Focus Site

Fiber Availability/Services at Site

Time Warner Cable has fiber and coax cable that run directly by the site. Frontier is the ILEC and can provide DSL, T1's and Ethernet services to the site.

Fiber Owner	Distance from Site
Time Warner	At site
Frontier	ICB

Fiber Diversity and Redundancy

Diversity is not available to this location.

Competitive Services

Frontier is the ILEC and can provide DSL, T1's and Ethernet services to the site.

Time Warner Cable can provide …..

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ECC TECHNOLOGIES

SECTION 6
SUMMARY AND RECOMMENDATIONS

Introduction

The purpose of this recommendations section is to define viable options and opportunities that the AGC can develop to enhance the broadband culture of the area. These recommendations, which are not defined in any particular order, represent a number of options that vary in cost, complexity, and involvement. Each recommendation can be acted upon individually or at the same time.

Below is a list of approaches that can be taken to improve the current broadband infrastructure and availability of broadband access.

6.1 ECC Recommendations

Technology Led Development

The creation of a Technology Led Development culture will require that the community as a whole understands and promotes the use of available resources to attract and retain culturally compatible technology companies. The Focus Sites and subsequent individualized studies done on each of them as part of this Study should be major components of the Technology Led Development initiative. Additionally, as new sites are identified they should be assessed and documented.

Use the Focus Site information and the GIS mapping information created in this study as an advertising component during Economic Development business meetings. Use the site profiles as a way to show off particular broadband attributes of areas of interest. As part of the response to site selectors, use the GIS mapping information to respond to formal requests for information.

Develop a formal plan to market Economic Development Focus Sites around existing high bandwidth areas, particularly for technology based and broadband intensive businesses (like R&D and data centers), and new business opportunities. Conversely, develop plans to bolster those sites that have less than desirable infrastructure and competitiveness.

Educate the Economic Development team in developing a basic understanding of the broadband industry and its importance to new business opportunities. Having County IT resources participate in the Economic Development process will help here.

Maintain and Update the Interactive Broadband Tool

This data is very sensitive and confidential. In whole it should not be made public without the express written approval of the service providers who own the infrastructure.

The AGC Region has developed an effective GIS-based tool, which if maintained and used properly will provide a competitive advantage for the region. A formal process should be implemented to first: use the broadband tools developed by this project, and second: keep them current. Economic developers and County planners should proactively use these tools to promote the strengths of the region and promote programs to address the weaknesses.

- Keep the project GIS database current by performing annual updates. These should be scheduled as a mandatory process.

- Developers should contact the providers and the utility industry to get updates on new coverage areas and services, or consider the establishment of a maintenance program where either the County IT departments or a consultant provides this service. Included in this should be new and/or revised Focus Sites.
- Educate economic developers on the use of these tools. County IT or GIS can provide broadband and technology based training to planners and developers.
- Use the updated database as a planning tool to work with broadband providers and various entities within the region to develop needed services.
- Allow Site Selectors access to the Focus Site information and aggressively promote broadband when promoting development sites.

Broadband and Broadband Committee

The AGC should consider the development of a formal based volunteer committee that focuses specifically on the development of fiber infrastructure and broadband to underserved and unserved areas. Additionally, this committee should be recognized by each of the Counties and tasked with specific deliverables relative to expansion of broadband investment in each County. Members can include private citizens, municipalities, businesseses, healthcare, and educational representation. This committee can work under the direction of the AGC, Chamber of Commerce, or Economic Development teams. Some of thes deliverables would include but are not limited to:

- Develop a strategic plan and set policy for the development and expansion of broadband and infrastructure within the region.
- Included in the strategic planning should be the development of and implementation of a Gigabit broadband plan which will serve as the guideline on the development of advanced Gigbit deployment in the region. This will be reguired to maintain competiveness of the region with many communities already in development of Gigbit solutions.
- Work to develop educational programs designed to inform public leaders and policy makers of telecom issues and concerns.
- Work with Economic Development teams and others to promote the region's telecommunication resources.
- Work with the telecom industry identifying and resolving issues and concerns.
- Coordinate regional telecom efforts with other State regions.
- Identify and pursue telecom and broadband grants and other funding opportunities.

Needs Assessment & Goal Setting

Meet with and interview key regional organizations to assess their broadband needs and goals for improvement. These needs can be used to demonstrate to service providers the justification to build fiber infrastructure into strategic locations, such as economic development sites and the more rural areas of the region. Organizations that would be included in the needs assessment and goal setting process are:

a) Educational institutions (school districts, colleges, libraries).

b) Municipalities and government agencies (state, county, town, village).

c) Emergency management and public safety.

d) Hospital and healthcare organizations.

e) Economic development agencies.

f) Key corporations and businesses within the area.

Expand County IT Department Responsibilities

Have each County's IT department members participate in potential new business meetings to help "sell" the region from a technology/telecom standpoint. A technical person at these meetings can offer valuable insight into the resources available at particular economic development locations. Establish expectations and responsibilities for the role of each resource.

Use of regional Assets

Meet with service providers and develop a relationship to address and resolve issues reported in each County. Create professional relationships with providers by meeting with them on a semi regular basis to develop a sense of partnership and discuss possible mutual interests. Identify opportunities with the broadband industry to expand broadband and develop desired solutions within the region.

Develop "carrots" to entice expansion of services. Through the use of grants, tax programs, Right of Way, franchise agreements, and regional assets such as tall buildings and tower space, work with the service providers to promote access and competitive services throughout the region. Negotiate and develop a business relationship to encourage carriers to upgrade and expand infrastructure and services.

Work with local service providers in the development of alternative broadband access, especially in remote areas that have been overlooked by the incumbents

Develop Infrastructure Partnerships/ Broadband Expansion RFP or collaboration

The development of an RFP or establishment of a collaboration for expanding broadband services in the region and investigate opportunities with the providers to bring fiber or wireless infrastructure to targeted areas of the region. The AGC or Broadband Committee would take the lead in developing a multi-company, multi-county collaborative, including providers that are already providing services today. SLIC networks, Hudson Valley Wireless and Rainmaker Network Services have all been awarded grants by New York State to expand services in the area. These three companies along with PrimeLink are working together to expand their current grant applications in the hopes of increasing broadband availability to additional unserved and underserved areas. Talks are currently underway and budgets will be formed in the near future. This collaboration is currently underway and should be managed by the previously mentioned Broadband Committee or an outside consultant.

Funding options will need to be explored so collaboration will be required from the County governments or regional AGC. Individual counties could let a request for proposals (RFP) that included a pledge of matching funds to service providers that are willing to expand services into underserved areas. It is anticipated that the AGC would work with the Counties to explore the possibility of getting grants for this purpose.

Two such funding sources would be the USDA or ESD departments. As a collaborative the team could apply for federal, state, and local grants that help rural areas assist providers in infrastructure development. The USDA Rural Utility Service:

http://www.rurdev.usda.gov/RUSTelecomPrograms.html

has yearly telecommunications-based grant programs to aid in the development of underserved areas of the country. These types of funding opportunities are often overlooked but can be very helpful in spurring local efforts.

Open Access Infrastructure and New Providers

Investigate and consider fiber builds to areas where broadband does not exist. If possible create a fiber ring by connecting the northern and southern routes.

In addition to service providers there are a number of organizations in the area that could be potential users of this fiber infrastructure, including the medical centers, higher education, and the K-12 school districts, just to name a few.

APPENDIX 1

GLOSSARY OF TERMS*

* All terms and definitions listed in this Glossary of Terms originated from various public resources.

ACCESS CHARGE

A fee charged to subscribers or other telephone companies by a Local Exchange Carrier for the use of its local exchange networks.

ADSL (Asymmetrical Digital Subscriber Line)

ADSL allows one-way transfer rates from 128KBps to greater than T-1 speeds over ordinary copper telephone lines. There is a distance limitation of approximately 12,000 to 18,000 feet from the nearest main facility (telephone company Central Office or equivalent).

ANALOG SERVICES

Analog Services refers to communications that transmit voice at its different frequencies without changing it. In voice communication, there is some fluctuation in frequencies, similar to the gradual change of a sine wave. In fact, a person's voice creates its own specific sine wave as he/she speaks. This wave, except for the frequency changed for transmission, is exactly how the signal is sent.

ATM (Asynchronous Transfer Mode)

ATM is a high-speed, low-delay transmission method. ATM uses fixed length cellular (chunks) to transfer voice, data, and video over twisted pair and optical fiber. ATM can be configured to allocate bandwidth appropriately to meet the needs of both time sensitive and non-time sensitive applications. ATM permits flexible allocation of available bandwidth for data, voice, images, and video. ATM uses a scalable architecture, making it easily upgradeable. Engineering studies indicated that ATM is capable of data rates of 622Mbps over fiber optic cable (SMF and MMF) and 155MBps over Category 5 UTP copper.

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.

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.

CARRIER

A Broadband company that offers communication services to the general public via shared circuits at published tariff rates. In the United States, the Federal Communications Commission and various state public-utility commissions regulate common carriers.

CDMA (Code Division Multiple Access)

CDMA is a digital wireless "spread spectrum" technology, which means that it spreads the information contained in a particular signal of interest over a much greater bandwidth than the original signal. Unlike many competing technologies, CDMA has no hard limit for the number of users who may share one base station (tower). With CDMA additional users can connect until the base station determines that call quality would suffer behind a set limit.

CELLULAR TECHNOLOGY

This term, often used for all wireless phones regardless of the technology they use, derives from cellular base stations that receive and transmit calls. Both cellular and PCS phones use cellular technology.

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 inter exchange 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 Broadband 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.

COMMERCIAL LEASED ACCESS

A manner through which independent video producers can access cable capacity for a fee.

DARK FIBER

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

DIGITAL

A function that operates in discrete steps as contrasted with a continuous, or analog, function. Digital computers manipulate numbers encoded in binary (on-off) forms, while analog computers sum continuously varying forms. Digital communications is the transmission of information using discontinuous, discrete electrical or electromagnetic signals that change in frequency, polarity, or amplitude. Analog forms may be encoded for transmission on digital communications systems.

DIGITAL DIVIDE

The availability of service between the areas that have access to advanced broadband services and those that do not.

DISTANCE LEARNING

Providing scholastic instruction to one or more remote locations from an originating classroom. This may be either one-way video with two-way audio or two-way video and audio. The transmission may be via satellite, cable TV, or switched networks.

DIRECT BROADCAST SATELLITE (DBS/DISH)

A high-powered satellite that transmits or retransmits signals that are intended for direct reception by the public. The signal is transmitted to a small earth station or dish (usually the size of an 18-inch pizza pan) mounted on homes or other buildings.

DS0

DS0 (see also 56Kbps) is the bandwidth required for one voice conversation. It is 64Kbps and is one of 24 channels in a DS1, or T-1.

DS1

DS1 (see also T-1) is the near equivalent of a T-1 though it is generally not channelized into 64KBps sub-channels. A DS1 consists of 1.544MBps of bandwidth and may be carried by public or private services on two pairs of copper cables. It takes 24 DS0s to make up one DS1.

DS3

DS3 is a digital circuit available from the PSTN with a bandwidth of 45MBps or 28 DS1 circuits. A DS3 requires the use of fiber optics or microwave for transmission.

DSL (Digital Subscriber Line)

DSL is new 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.

EVDO

EVolution, Data-Only is part of a family of CDMA2000 1x digital wireless standards. 1xEV-DO is a "3G" CDMA standard. EV-DO provides data rates over ten times faster than 1xRTT, the previous data technology for CDMA networks.

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.

FIBER OPTIC SERVICE (FIOS)

A fiber to the premises (FTTP) data communications service offered by Verizon that uses fiber optic cables to transfer data.

56KBPS (56,000 Kilobits Per Second)

56KBps is the bandwidth required for one phone conversation and a common WAN connection speed, referred to as DS0. The 56KBps transmission speed is achieved by breaking a DS1 (1.5436MBps) into its 24 component channels.

GSM (Global System for Mobile Communication)

GSM is currently the dominant 2G digital mobile phone standard for most of the world. It determines the way in which mobile phones communicate with the land-based network of towers.

HEADEND

The control center of a cable-television system, where incoming signals are amplified, converted, processed, and combined into a common cable for transmission to subscribers.

INCUMBENT LOCAL EXCHANGE CARRIER (ILEC)

An ILEC is the local telephone company that provides service to business, organizations and residence within the LATA. The ILEC is responsible for the development, maintenance and support of cabling infrastructure necessary to provide Broadband services within the LATA.

INTEGRATED SERVICES DIGITAL NETWORK (ISDN)

A public-switched network providing digital connections for the concurrent transmission of voice, video, data, and images. Often seen as a technological bridge between the current telephone system and an upgraded, broadband network.

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 in 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.

ISDN (Integrated Services Digital Network)

ISDN is a transmission scheme that comes in two different capacities: 1) BRI (Basic Rate Interface), which equates to 128Kbps of usable bandwidth, and 2) PRI, Primary Rate Interface, equivalent to a T-1 (1.5436MBps). ISDN is divided into bearer (or B-channels) and data (or D-channels). In BRI, ISDN is composed of 2B+D; the two bearer channels are 64KBps used to carry user data or one voice conversation and one 16KBps for control and signaling information.

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.

LOCAL EXCHANGE CARRIER (LEC)

A LEC is a telephone company or Telco that offers local and long distance telephone service within a defined region referred to as the LATA—Local Access & Transport Area. A LATA or is the regional calling area within which the incumbent local telephone company provides local and long distance services. Service to points outside the LATA is provided by long distance carriers.

LEASED LINE SERVICES

Leased lines are typically voice, video or data communications circuits provided by a telephone company or cable company and leased for a cost-per-month to a customer. Typical lease lines include 56KBps, ISDN BRI and PRI, T-1, and DS3.

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.

PERSONAL COMMUNICATIONS SERVICE (PCS)

Any of several types of wireless, voice and/or data communications systems, typically incorporating digital technology. PCS licenses are most often used to provide services similar to advanced cellular mobile or paging services. However, PCS can also be used to provide other wireless communications services, including services that allow people to place and receive communications while away from their home or office, as well as wireless communications to homes, office buildings and other fixed locations.

POTS (Plain Old Telephone System)

POTS refers to an un-enhanced telephone service with the ability to send and receive phone calls. Features like call-waiting and call-forward are available.

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

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 a cable company, a telephone company or power company. Cities typically require written permits—usually for a fee.

SATELLITE

A radio relay station that orbits the earth. A complete satellite communications system also includes earth stations that communicate with each other via the satellite. The satellite receives a signal transmitted by an originating earth station and retransmits that signal to the destination earth station(s). Satellites are used to transmit telephone, television and data signals originated by common carriers, broadcasters and distributors of cable TV program material.

SONET (Synchronous Optical NETwork)

SONET is an optical network used to transport many unique digital signals (ATM, T-1, etc.) over the same optical carrier. Its physical interface is the OC (Optical Carrier), which has a base rate of OC-1 (or 51.84MBps), and continues to as high as the theoretical limit of 13Gbps; however, OC-48 (2.5GBps) is the current limit.

T-1 (DS1)

The T-1 standard has a speed of 1.544MBps in the United States. The T-1 standard has carried over to data networking from the voice arena where it was used to describe a carrier that could carry 24 voice conversations over a clear channel (64KBps, DS0).

T-1 LINE

Broadband line with bandwidth capacity of 1.54MBps.

T-3 LINE

Broadband line with bandwidth capacity of 45 MBps.

3G

3G is the third generation of cellular technology with analog being the first and digital being the second.

TRUNK

Trunk is a communication line between two switching systems, which typically include equipment in a central office (the telephone company) and PBXs.

VIDEO HEADEND

Video Headend is the originating point of a signal in TV cable distribution systems. Video editing and other electronic equipment are generally found at the "head-end."

WAN (Wide Area Network)

WAN is used to extend LAN connectivity beyond a city or County, usually through common carrier facilities at either 1.544MBps or 56KBps. Typical technologies used are frame relay, X.25, and ISDN.

WIDE-AREA NETWORK (WAN)

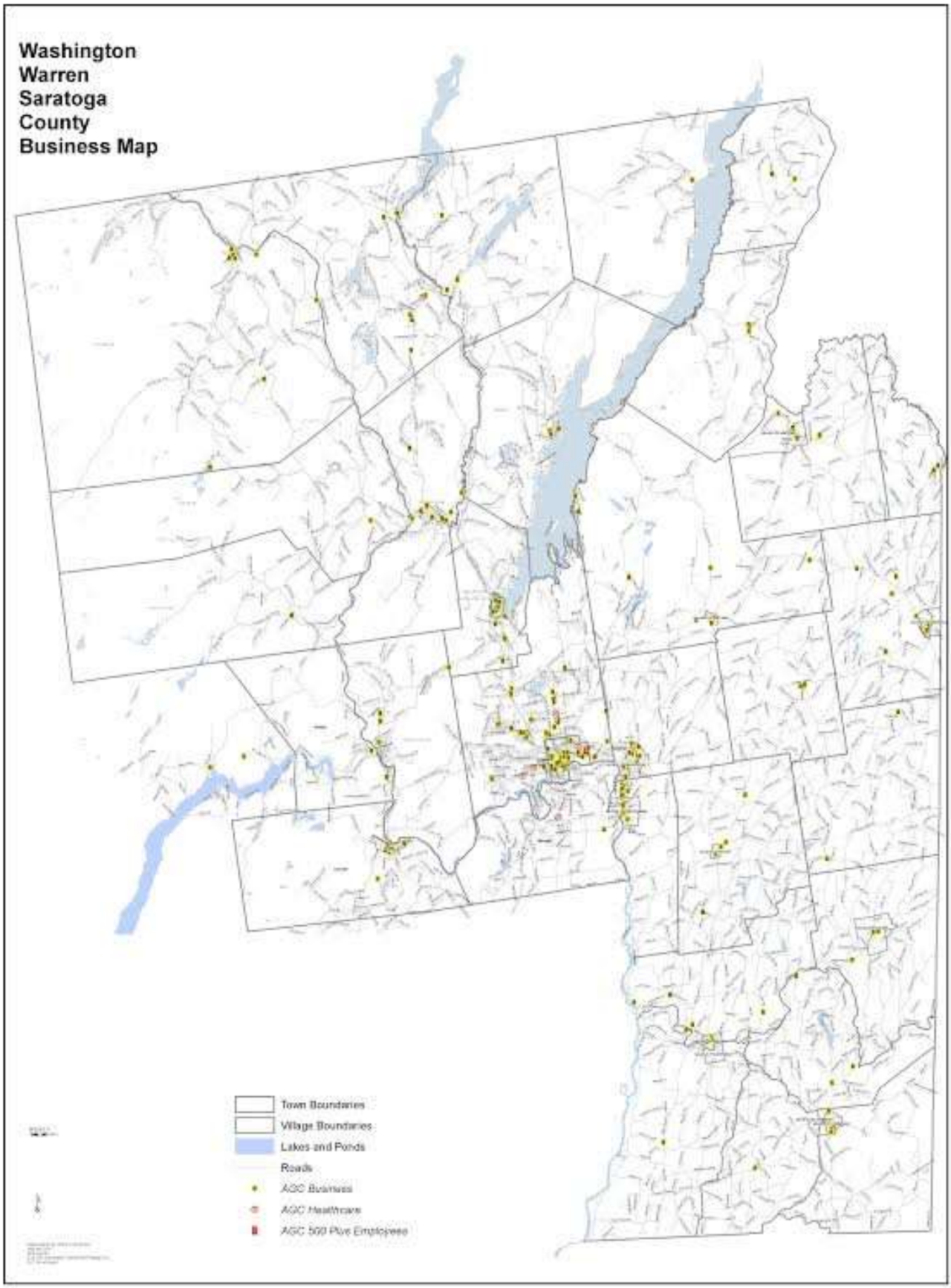
A network of computers spread out over a large geographical area (compared with local area networks). Florida, Kentucky, Pennsylvania, Texas, and Virginia have developed, or are developing, statewide computer networks dedicated to education use.

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 2012 and beyond.

APPENDIX 2

MAP OF HEALTHCARE/GOVERNMENT OFFICES & MAJOR EMPLOYERS


Washington
Warren
Saratoga
County
Business Map
Town Boundaries
Village Boundaries
Lakes and Ponds
Roads
AGC Business
AGC Healthcare
AGC 500 Plus Employees