Greene County Telecommunications Plan

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Table of Contents

Introduction

Current State of Telecommunications

As the first decade of the 21st century comes to a close, telecommunications and broadband access are transforming the ways people communicate and live. Whether it's by phone, Internet, video conferencing or wireless technologies, people want to be connected everywhere and at any time.

Examples of this can be found in the healthcare industry, where doctors and healthcare providers render care through telemedicine systems and in the education industry where educators are using telecommunications for distance learning and online research programs. Governmental organizations across the country are using telecommunications to consolidate services between towns and cities and to improve the effectiveness of their emergency management systems.

In the business world, telecommunications services are transforming the way companies conduct their daily business operations. Telecommunications services can increase productivity while at the same time provide cost savings. Today, businesses no longer just use telecommunications services to connect to their remote locations. They are connecting directly to other businesses and to customers across the country and around the world. In today's economic climate, companies are striving to find ways to become more efficient and competitive in the global economy. Progressive companies are accomplishing this by taking advantage of their telecommunications resources.

For these reasons and many more, telecommunications has a major impact on a community's economic competitiveness. Furthermore, a strong telecommunications base is required to establish global competitiveness and has become a primary factor of consideration when a business is deciding to relocate to a particular area.

Telecommunications and Broadband Issues in Rural Upstate

In the past, significant infrastructure investment in rural upstate New York has not been an area of focus for the telecommunication industry. This has been mainly due to the low population densities and extended return on investment models. As such, much of the infrastructure in place today has been in operation for 50 years or more. The industry's focus is elsewhere with the majority of investment dollars being spent in high growth areas such as tier 1 and tier 2 cities. Comparable to the rural areas of this country before the National Rural Electrification Act of 1930, many areas in upstate NY are being rapidly left behind.

Federal Government Broadband Grant Programs

On February 17th, 2009 the American Recovery and Reinvestment Act of 2009 was signed into law. Among other things, the Act set up two programs to provide $7.2 billion for broadband access development through grants and loans.

The first program is being administered by the Commerce Department through the National Telecommunications and Information Administration's (NTIA) "Broadband Technology Opportunities Program". This $4.7 billion program is intended to "award competitive grants to accelerate broadband deployment in un-served and underserved areas and to strategic institutions that are likely to create jobs or provide significant public benefits." The second round of funding under this program is targeted at "middle mile" or backbone initiatives. Projects funded by the NTIA must be non-discriminative and provide open access. There is 20-30% matching funds component to this program and applications for the second and final round were due by March 15th, 2010. Also, the funds must also be distributed before September 30th, 2010 to projects that can be completed within two years.

In the second program, $2.5 billion will be awarded by the Agriculture Department's Rural Utilities (RUS) for broadband deployment in rural areas with similar conditions; however, this program is targeted at "last mile". The RUS program involves loan programs as well as grants. There is 75/25% grant to loan funds component to this program and applications for the second and final round were due by March 26th, 2010. Both programs are designed to facilitate the availability, development and adoption of broadband technologies. It should be noted, while considerable attention is being placed on where broadband is and who has it, equally important is the availability of infrastructure to support the development of broadband technologies. Typically the lack of broadband in rural areas is directly related to the lack of suitable infrastructure to deliver it. Greene County was represented in this round via a grant submission from Mid Hudson Cable.

1.0 Commission of the Study

For Greene County to compete and prosper in the 21 Century global economy and provide its citizens with equal access to broadband service, improvements to its current telecommunication environment will be necessary. As such, the Greene County Legislature commissioned ECC Technologies to accomplish the following objectives:

- Inventory, to the extent possible, the current telecommunications infrastructure and services supporting the rural areas of Greene County.
- Work with the Department of Economic Development, Tourism and Planning to overlay telecommunications facilities and infrastructure into the County's Geographic Information System (GIS).
- Present an assessment on the gaps between County needs and current infrastructure.
- Discover, to the extent possible, Incumbent Carriers infrastructure plans and gauge their willingness to create a public/private partnership with the County and other incumbent providers.
- Identify stake holders and potential infrastructure users.
- Create a preliminary general cost estimate for the construction of a public/private open access infrastructure system.
- Assist with Federal Stimulus Grant Submission if applicable.

This project was administered by the Department of Economic Development, Tourism and Planning. The Telecommunications Team also working on this project and instrumental in its development, included: the Directors of the Greene County Departments of Emergency Services and Information Services; and the Executive Director of the Greene County Business Alliance, which also contributed financially to the development of the Plan.

Existing Telecommunications Assessment

To begin the process of improving broadband access in underserved areas, a detailed understanding of what exists today must be determined. As part of this initiative a physical inventory of existing telecommunications infrastructure in the County was identified and documented. The inventory included; fiber optic cable from the telephone companies, fiber and coaxial cable from the Cable TV industry, the location of the wireless towers and the providers of cellular phone service. With the help of the Greene GIS department this information has been developed into the County mapping program.

Emergency Management Services

ECC assessed the current EMS/911 communications infrastructure and services to determine and recommended areas for performance improvements and/or cost savings. The assessment included broadband networking opportunities to support current and emerging technologies for public safety and emergency management, including mobile data communications. An infrastructure plan to support the development of EMS technologies will be developed and integrated with the Infrastructure study.

Needs Assessment

In addition to the existing physical infrastructure assessment, an infrastructure/broadband needs assessment was preformed. The needs assessment process included identifying and meeting with potential high bandwidth users in the County to gain an understanding of the current need for infrastructure. Key telecommunications service providers in the area were interviewed to understand their current and future infrastructure needs. A main focus of the interviews was how each organization would benefit from improved infrastructure.

ECC Technologies conducted interviews with key County personnel and high bandwidth users to understand County telecommunication needs and present an assessment on the gaps between county needs and current infrastructure.

Key areas of focus include:

- Public Safety, 911/Emergency Medical Systems
- County Economic Development
- County Information Technology
- Education - BOCES & Universities
- Healthcare

The information compiled by ECC Technologies is presented in the following pages of this report. This database tool consists of interactive mapping elements that can be used to identify and locate the major telecommunications resources within the County for economic development and County planning purposes.

1.1 Executive Summary

The following report is a compilation of the telecommunication service providers and supporting infrastructure in the Greene County. The scope of work included documenting critical infrastructure and services available in the County. The data collected includes all the relevant service providers: incumbent service providers, competitive service providers, and wireless providers. Information on infrastructure was also collected including fiber and coaxial cabling, wire line boundaries, central office locations with available services and wireless towers with contact information for each.

Research Methodology

To gather the information required for this study, ECC technologies conducted in person and phone interviews with the major telecommunications providers, and performed field surveys or "wind shield studies" to identify and document outside plant (OSP) or cabling infrastructure. Additional sources including publicly available databases managed by federal and state agencies, and information purchased from telecom industry database research organizations were used to complete the inventory.

Other Resources

Other resources included telecommunication provider websites, telecommunication industry professionals, outside plant engineers, and ECC Technologies' experience and knowledge of the telecommunications industry.

GIS Mapping / Database

All infrastructure information discovered in this inventory project has been integrated into a GIS model developed by the Department of Economic Development, Tourism and Planning. This GIS database will be administered, stored and updated by the County to ensure security and continuity of the resource.

The GIS database of information was developed to support telecommunications and economic development initiatives. This information will be used by the Department of Economic Development, Tourism and Planning for county and local level use. The maps included in this report represent the county's telecommunications infrastructure documented in the winter of 2009.[1]

[1] Please note when viewing the report maps, due to the limited size and scale of the print the fiber optic cable shown can represent one or a number of provider's fiber lines following a particular route or roadway.

1.2 Telecommunications Infrastructure

Telecommunication in the County is delivered via a number of competing providers using different technologies and infrastructures. The primary owners of telecommunications infrastructure in the County include the following three (3) incumbent telephone companies: Verizon Communications, State Telephone Company and Berkshire Telephone Corp. (Fairpoint Communications). In addition to these incumbent telephone companies, there are two (2) cable TV companies: Time Warner Cable and Mid-Hudson Cable as well as numerous wireless companies. These organizations provide voice, video, and data services using a variety of technologies and infrastructures, which include land based telephone and cable television (CATV) lines as well as wireless towers. The telecommunications infrastructures in use by the industry today in the County are land lines consisting of copper, coaxial, fiber optics or wireless based technology utilizing strategically placed towers.

Wire Line Infrastructure

Wire line infrastructure includes telephone and cable TV cables which are either buried in the ground or placed on utility poles. Wire line cables can be fiber optic, coaxial or twisted pairs of copper wire. The wire line infrastructure for the region is primarily owned and operated by the incumbent telephone carriers and the cable TV companies.

Copper Telephone Infrastructure

Traditional telephone copper cable is still the most used infrastructure serving homes and businesses across the County. Copper cable is used by the telephone companies primarily to connect central offices (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 very limited capacity for broadband service and is typically the reason why advanced telecommunications services are not available in certain areas. The limitation of providing broadband access over copper is a direct result of distance from the central office, the age of the cable, and the poor performance qualities of the cable in general.

Coaxial Cable TV Infrastructure

The cable TV industry utilizes a hybrid fiber optic/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. Broadband access is available in many parts of the region via this hybrid fiber/ coaxial infrastructure installed by the incumbent cable TV providers.

Fiber Optic Infrastructure

Telecommunication companies have fiber optic cabling installed throughout the County using it primarily as an aggregation or a backbone resource. This infrastructure is used to interconnect central office locations (location of telephone company switches), aggregate copper lines or in some cases to make fiber connections to the end user. The cable TV companies have also installed fiber throughout the County and typically use it to extend service into neighborhoods and communities.

Both the telecommunications companies and the cable TV providers have made a considerable investment in fiber optic cable in the region over the past 10 years.

Wireless Infrastructure

Wireless technologies are the fastest growing segment of the telecommunications industry. Wireless infrastructure supports cell phones, pagers, personal digital assistants (PDAs), mobile data terminals, messaging, and Internet services. Wireless access is available for wireless towers as well as tall building locations in many areas of the County. However, as with other areas in upstate NY, due to terrain issues and lack of potential users, many remote rural areas do not have wireless coverage.

Cellular Infrastructure

Cellular towers are used by the cell phone service providers to transmit voice conversations from one area or "cell" to another. These towers are strategically placed to provide the most coverage with the least number of sites placed. Cellular towers in the County are placed primarily along major traffic corridors and populated areas throughout the County so that the cellular companies can provide coverage to the most number of users. Currently a lower grade of broadband service is available from cellular providers. The eventual rollout of 3G wireless services by cellular providers will have a positive impact on broadband deployment in their footprints covered.

Satellite Communications

Satellite service is an option for deploying voice, data and Internet services to areas with limited landline infrastructure and/or poor line of site for terrestrial wireless communications. Satellite communications is still considered a "last resort" service because it is expensive, has latency issues, and can be unreliable.

Central Offices

The central office or CO is a building structure that the incumbent telephone company uses to operate voice, data and video switching equipment. The services available from the local central office for a given area determine the level and availability of services within that wire boundary or area. The County has three (3) primary incumbent local exchange carriers (ILECs), two (2) that have installed and provide service from a number of central offices (CO) within the County boundaries.

Verizon's access to advanced services are lacking in some of the COs they have in the region. The other ILEC have offerings that include, at a minimum, DSL. In terms of providing higher bandwidth services, each of the ILECs will generally build infrastructure and procure equipment if market demands warrant it. Refer to the information below and Section 3 for central office details.

1.3 County Telecommunications Summary

ECC Technologies has identified three (3) incumbent local exchange carriers (ILEC), four (4) extended link based competitive local exchange carriers (CLECs) and three (3) long distance companies in the County area. Additionally, there is one (1) Internet service provider, two (2) cable TV providers, and three (3) major cell phone service providers.

From an infrastructure standpoint there are 12 central offices (COs) that are primarily located in the villages, 12 FCC registered towers, with the majority of these located in close proximity to developed areas and/or major transportation corridors. In addition, there are many miles of fiber infrastructure installed along the major transportation corridors linking towns and communities.

1.4 Primary Telecom Providers Summary

Through meetings and a telecommunications questionnaire each service provider was asked to provide information on the boundaries of their territory, the available services in that area, the type of equipment in use, their availability of system and network redundancy and any future plans for service upgrades or improvements (1 to 2 years out). Listed below are the primary telecommunications companies located in the County and a summary of the information they provided.

ILECS

Of the three (3) ILECs operating 12 central offices in the county area, Verizon is by far the largest in terms of territory and size. The other incumbent providers are State Telephone Company, which operates two COs in the County, and Berkshire who does not have a CO in the County.

Verizon Communications

Verizon Communications territory covers almost the entire county and is therefore the dominant incumbent telephone company in the County. Verizon's main hub for network support and business operations for the region is located in Albany, NY. Verizon offers dial-up, T1 and DSL from many of its COs located in the county. Verizon stated they have no plans in the near future to introduce new DSL services. Verizon did not comment on any other future plans.

State Telephone Company

State Tel's territory covers mainly the northeastern part of the county, specifically operating out of two COs located in Coxsackie and New Baltimore. State Tel offers DSL and long distance through associated carriers (e.g. AT&T, Sprint, MCI, Global Crossing and Quest). State Tel will be offering cable TV through high speed Video DSL (VDSL) service and VoIP service also through their existing DSL service in the future. State Telephone did not guarantee expansion into other portions of the county.

Berkshire Telephone Corp.
Berkshire Telephone serves five communities in Columbia County. They are headquartered in Kinderhook, NY. Berkshire Tel does not operate out of any COs located in Greene County. However, because their main hub is so close to Greene County, they do provide service to a very small portion of New Baltimore.

CLECS

CLECs, or competitive local exchange carriers, are telephone service companies that compete with the incumbent telephone company within the incumbent's territory. They are a product of the 1996 Telecommunications Act that sought to put competition in the telecommunications industry.

One Communications
One Communications' main office in the region operates out of Albany, NY. One Communications can offer the following services to the region through leased lines, VoIP, MPLS, T1, and T3, service on an individual case basis. One Communications' network switches are located outside the region with the nearest equipment locations in the Albany area. One Communications does not foresee any build-out plans for the Greene County area.

Level 3 Communications
Level 3 Communications' main office in the region is located in Albany, NY. Level 3 Communications can offer the following services to the area through leased lines: VoIP, T1, T3, Wireless access points and VPN services. Level 3 Communications' nearest network switching equipment is located outside the region in Albany. Level 3 does not foresee infrastructure build-out in the Greene County area, but will review customer requests on an individual case basis.

Global Crossing
Global Crossing's regional office is located in Albany, NY. Global Crossing can offer the following services to the area through leased lines, VPN, Remote VPN, VoIP, ATM, Frame Relay and Wireless services. Global Crossing has the nearest equipment located in Albany, NY. Global Crossing has stated they will take customer requests on an individual case basis.

Paetec Communications Inc.
Paetec Communications has locations in Albany, NY that support the region. Paetec focuses on general businesses, government and education in the area. Paetec can provide voice services which include a "Centrex like" service that is IP based, T1, T3. Paetec is currently developing interconnect agreements with a number of the incumbents to provide competitive service throughout the region. Paetec has stated that their plans for the area are dependent on the ILEC and their access carriers.

Embarq/Century Tel
Embarq has merged with Century Tel to form Century Link. Century Link will no longer have a presence in New York State. Plans for future infrastructure expansion into NYS have not been planned at this time.

TechValley Communications

Formed in 1999, Tech Valley Communications (TVC) is a locally owned facilities-based telecommunications provider headquartered in Albany New York's Tech Valley Region. TVC has experienced steady, organic growth and has expanded its local presence through the successful acquisition of GFC Communications in 2000 and its combination with Mid-Hudson Communications in August 2002. TVC now operates its own switching facilities and an extensive fiber network throughout the Tech Valley Region. Currently TVC employs approximately 50 people at its various locations in downtown Albany. TVC offers a full range of local and long-distance voice services, data, high-speed and dial up internet service. TVC also has co-location facilities available. All services delivered to the TVC co-location facility are via geographically diverse fiber optic based systems. IP services are routed on multiple Gigabit Ethernet connections to the TVC core network located at 11 North Pearl Street, Albany, NY. The core network is linked to the Internet via TVC owned fiber optic connections to Qwest, Global Crossing, AT&T, and Sprint.

CABLE PROVIDERS

Time Warner Cable

Time Warner Cable (TWC) is the second largest cable operator in the United States providing service to more than 14 million customers. TWC provides cable TV, high speed Internet and digital phone service to many areas for both residential and commercial customers, as well as fiber optic services particularly in the eastern half of the county. TWC has stated that they do not foresee any new infrastructure development for the region in the near future.

Mid-Hudson Cable

Mid-Hudson Cable provides cable TV, high speed internet and digital phone service to residents and businesses mainly in the central and eastern part of the county. Mid-Hudson in cooperation with the county has developed an engineering plan for last mile infrastructure build-out and has submitted an application to the federal government for stimulus funding under the Broadband Initiative Program (BIP) through the Rural Utility Service (RUS). Mid-Hudson is developing a plan to offer fiber to the home with the successful stimulus funded project.

1.5 Other Providers Summary

In addition to the primary telecom providers in the region there are a host of other alternative telecommunication resources available to the area. Of these, Tech Valley Communications provides fiber connections and offers long distance services to the Greene County office building at 411 Main Street.

Internet Service Providers

There are no local ISPs in Greene County. The larger and more dominate providers are the ILECs and cable TV companies. Due to the number of companies offering Internet access service across the region, the choice of providers is high. However, many of these organizations utilize the incumbent's cable and equipment infrastructure to provide their services.

The exception is wireless Internet service providers (WISP) which include the cellular industry and small startup WISP such as NYAir.

NYAir

NYAir is owned by Surferz.net which is located in Greenville, NY and is a wireless internet service provider along with other internet related services i.e. webpage design and hosting, email, server collocation, and dedicated circuits. NYAir can offer dedicated T1 lines as well as provide fixed wireless high speed broadband internet. NYAir is currently present in Albany, Greene and parts of Columbia counties. NYAir stated that they are not expecting to build out infrastructure but are looking to update current technology at their POP's.

Wireless System

There are currently 12 wireless towers (registered on the FCC website) constructed in the County. Most of the towers in the region have cellular equipment installed on them to provide cell phone coverage. The majority of these towers are located on major roadways and population centers, with the highest concentration of towers positioned in and around the major towns. This is done to provide the most coverage to the highest number of users with the least amount of towers. Unfortunately, because of this strategy, cell coverage can be spotty or non-existent in many of the remote areas on the region. The service coverage of a typical cellular equipped tower can be anywhere between 1 and 10 miles depending on the equipment in use, how the equipment is configured and the height of the towers. There is one Wireless Service Provider in the area that provides service; either way choice enables healthy competition. The major cellular provider in the region is Verizon Wireless.

Cell Towers

Cell Tower owners consist of real estate developers and wireless telecom providers. Some of the larger cell tower owners in the County are Crown Atlantic and SBC. The two are cell tower builders that lease space to other providers.

Cellular Service Providers

Of the three major providers, Verizon Wireless uses the highest number of towers followed by AT&T, and Sprint Nextel. The cellular providers in the region are working on moving their services to 3G or third generation cellular which will allow for high bandwidth and better applications. However, as with wire-line service their resources are limited and their connections to the tower are typically no more than 3 mbps.

1.6 Municipal Infrastructure

Educational Systems

Educational entities, both K-12 and higher education, across New York State are rapidly deploying high capacity networks in an effort to meet the demand of technology based education. The desired bandwidth capacities being installed between most districts in the state are at gigabit speeds.

Applications such as Distance Learning, Internet Access, Access on Demand, and remotely collaborative programs, are driving the demand in educational bandwidth requirements nationally.

Formerly named Rensselear-Columbia-Greene Board of Cooperative Educational Services (BOCES), Questar3 provides instructional and support services to twenty-three (23) school districts in Rensselear, Columbia and Greene Counties.

Public Safety Towers

The radio system is based on a more than fifty (50) year old six (6) tower microwave and T1 configuration. Currently the system has good coverage in the eastern parts of the county but there have been issues with dead spots in the western portion of the county. The county is in need of channel expanding as the fire department is currently operating on four channels. It costs the county approximately $150,000 per year to maintain its current communications infrastructure.

The communications system infrastructure consists of 6 tower sites which are leased by the County. The sites are located in the following areas of the County: Hunter, Catskill, Cairo, Coxsackie and New Baltimore. The County is currently dependent upon Verizon tie lines to provide communications to these towers at a cost of roughly $66,000 per year.

Dark fiber would be the ideal mode of telecommunication transport for these towers as the robust capacity would prevent the need for upgrading and adding additional lines to these sites. This would in effect provide more capacity for information to pass through as well as limit the cost to do business for the public safety departments.

1.7 County Summary

Telecommunications

There are three (3) ILECs in Greene County. Time Warner Cable (TWC) and Mid-Hudson Cable also provide services in the County. They are the major owners of telecommunications and cable TV infrastructure respectively. Verizon's territory covers over 90% of the County from an ILEC standpoint. The County's ILECs have developed a total of 12 central offices within the County. These central offices represent the core of telecommunications in Greene County. Verizon offers DSL from every one of their COs with State Telephone providing DSL from two in the northeast. In addition to the ILEC's infrastructure, Mid-Hudson Cable has a head-end, or point of equipment (POE), located in the town of Coxsackie and provides voice, video, and data services.

Owners of Fiber Infrastructure

There is a network of fiber optic transmission routes down the eastern of the County with infrastructure into parts of the central areas as well. Outside of single fiber routes, the western half and parts of the central portion of the County is devoid of telecom fiber cable. The telecom fiber optic cable in the County is primarily between COs and not typically providing service directly to customers. Cable TV fiber is located in the east, limited parts of the central and northern portions of the county.

Types of Services

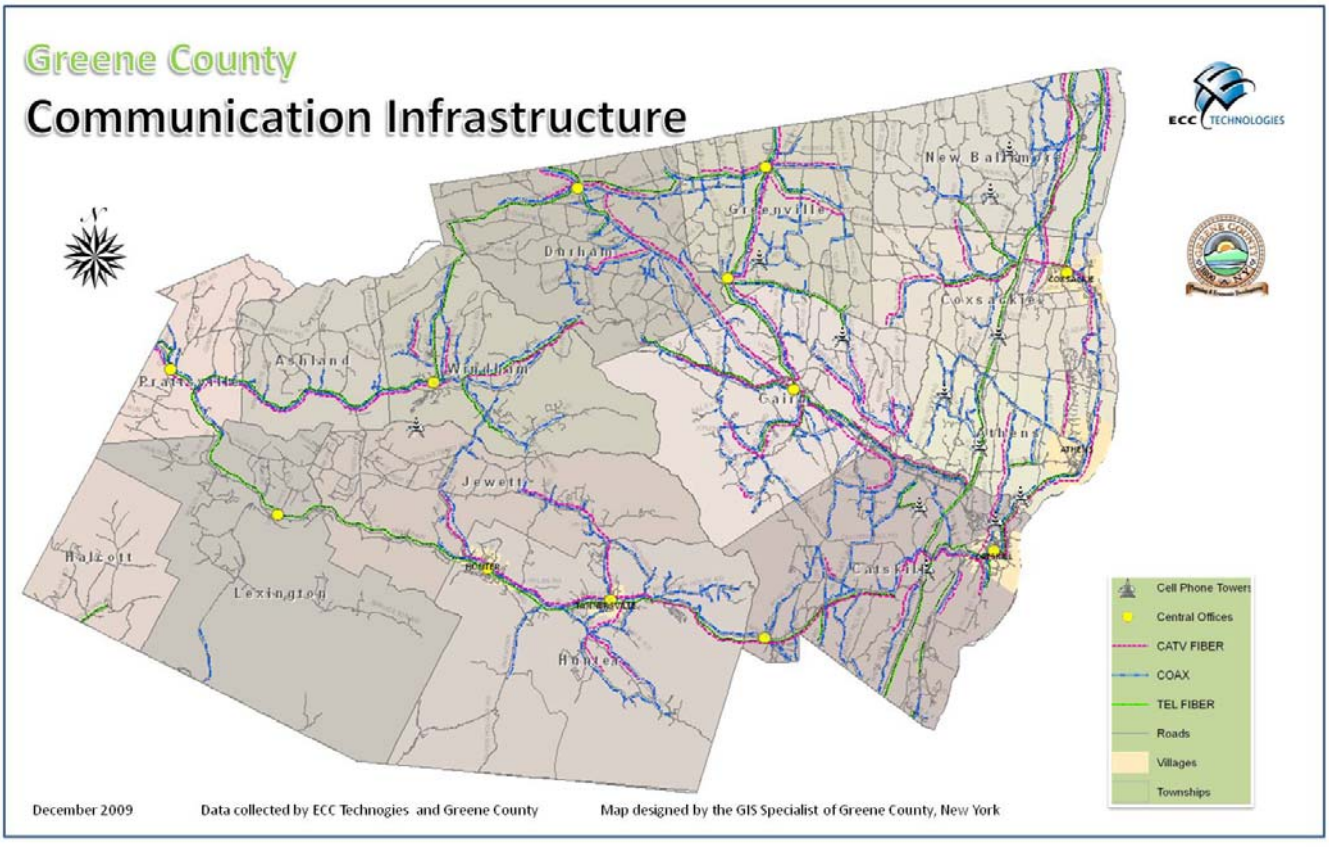
State Telephone is a small local telephone company whose service offerings are limited to DSL and T1 into a small area in the northeastern part of the County. Mid-Hudson, Frame Relay and T1/T3 as standard services will offer ISDN, ATM and Gigabit Ethernet on an individual case basis. Verizon offers DSL from its entire Cos. These services are limited to the structure of cable plant available in their respective areas.

Competition

In addition to the incumbent's presence in the County, remote switch/extended link and resell services are available from a number of CLECs including but not limited to Paetec, One Communications, Level 3 Communications and TW Telecom. These organizations are not "co-located" or have equipment in the County and are therefore either reselling service or extending services from outside the area. Either way, this set up limits their effectiveness as competitors. Cellular coverage is supplied by AT&T Mobility, Sprint / Nextel and Verizon Wireless.

The County is served by 12 ILEC central office and 12 wireless tower locations. Cable TV and wireless access are more readily available in the eastern half of the County. For the most part, higher order telecommunications services (such as ATM or Gigabit Ethernet) are not available. The ILEC, CLECs, and third party organizations offer Internet service to select areas.

- ILECs: Verizon, State Telephone, Berkshire Telephone Corp.
- CLECs: One Communications, Paetec, Level3, TW Telecom
- Central Offices: 12
- Cellular Towers: 12
- Cable Providers: Time Warner Cable, Mid-Hudson
- Wireless Providers: NYAir
- Fiber Providers: Services based – Mid-Hudson, Time Warner



1.8 Conclusion

Greene County has a large area of limited or no broadband access from both land based and wireless technologies. Many of the central offices offer basic DSL service but due to the distance limitation of DSL and the size of the area each CO serves, many areas that have DSL available are out of its reach in terms of service. Cable TV access is limited as well, with much of the fiber and coaxial cable needed to provide this service located only in the villages and major roads. In addition, there are areas in the central and western half of the county that are very limited in the number of wireless towers. However, it should be noted that this County has a small WISP (NYAir) that is working to provide access to the areas of the County not currently served. Greene County would be considered below average in comparison to a typical upstate NY rural county regarding broadband availability.

As with many areas of New York State, we have found that the majority of telecommunications infrastructure and therefore available services are located in the population centers in the region and the main thoroughfares. Almost predictably, the incumbents have invested in areas that will give them the largest return on investment and left many of the more rural areas behind.

The incumbent telephone companies have installed, at a minimum, DSL equipment at each of their respective central offices (Verizon has stated they have no plans in the immediate future to install new DSL locations). However, since DSL has a practical distance from the CO limitation of approximately two and one half miles, there are many areas that assuredly do not have access. In addition, the majority of fiber in the region appears to only connect the central offices together and therefore provides limited, if any, benefit to the larger organizations in the region that are potential users of this technology.

The cable TV industry has likewise installed fiber and coaxial cable which they use to provide voice, Internet and video services to the select areas of the region. Time Warner Cable typically builds to areas with a minimum home density of 12 homes per linear mile. Those areas with less than 12 homes per mile typically cannot support the investment required to build the infrastructure. Mid-Hudson Cable is currently investigating the option of extending their current outside plant infrastructure. Through the American Recovery and Reinvestment Act of 2009, Mid-Hudson has applied for stimulus funding under the Department of Agriculture's Rural Utility Service (RUS) or BIP funding. The cable TV services are typically delivered into a neighborhood by optical fiber and delivered to homes via coaxial cable. Mid-Hudson is also exploring fiber-to-the-home possibilities.

The cellular industry in the region has placed the majority of their towers in the more populated areas and much fewer in the remote areas. With the major providers stating that they will not be adding towers in the near future, the pace of improvement in terms of cellular coverage will be slow at best. In addition, most towers are connected via T1s so there is limited bandwidth for next generation technologies. Satellite technology is a viable option. However, it is limited in the bandwidth that can be delivered and still relatively expensive.

The fiber initiative between Mid-Hudson Cable with the support of Greene County could become a very significant asset to the region if the fiber is routed to the right places and connects the areas of need. Discussions are ongoing to connect the public safety towers via Dark Fiber. This will allow the ability to provide expanded broadband services necessary for the rapidly expanding public safety services and applications being implemented today. Futuristically, this will also provide the backbone of an influential public-private partnership needed to expand service to areas of the county currently not afforded broadband access. If these two conditions are met, the prospects of a sustainable high bandwidth telecommunications backbone could make a tremendous impact on the economic development and quality of life in the region.

With the recent announcement of the United States Federal Broadband Stimulus Fund which has put aside $7.2B to fund underserved and un-served areas of the country, the timing of this inventory could not be better. However, it is our opinion that without the active support of the municipal organizations across the region that the telecommunications profile will not experience significant improvements.

The County's Department of Economic Development, Tourism and Planning and the Greene Business Alliance have seen the need for developing and expanding infrastructure in the more rural areas of the county. The expansion of the network will make it possible for companies (small office/home office) to branch out and healthcare facilities to access medical networks (medical records) and businesses currently without the required broadband to gain access.

1.9 Recommendations

Through the process of this inventory study, we have discovered that the Greene County is not unlike many upstate NY rural areas. The developed areas, such as villages and cities, are better served than the outlying regions. As illustrated in the maps included in this report, there are many areas in the County that do not have access to broadband and advanced telecommunications services, let alone choice of provider. Overall, the rural areas of the County are consistent with and comparable to other rural communities in the state. Having said that, portions of the County especially those in the central and western portions that are greater than ½-1 mile from major traffic corridors generally have no access to any advanced telecommunications services. This has a significant impact on economic development and the county's ability to establish itself as a desirable location for home office professionals.

Through interviews with each of the major providers in the County, it has been made apparent that the service providers are anticipating very little activity and investment in the foreseeable future in terms of new services or infrastructure. The exception is Mid-Hudson Cable Company. They are planning on expanding current infrastructure with a roll-out of approximately three years.

We believe this project if funded will have a significant impact on the respective regions once implemented. At this point we believe this project is a good candidate for the Broadband Stimulus Program grants and are awaiting notification of Grant decisions.

The County has made an important first step toward understanding and developing their telecommunications resources as a community asset by commissioning this study.

There are a number of measures that can be undertaken to continue the development of the County's telecommunications infrastructure, each with varying levels of resource commitments.

- Maintain the GIS Telecom Database to perform periodic updates of the mapping tools developed in the County GIS System.
- Establishment of a telecommunications Focus Group or committee that will be recognized by the County and tasked with specific deliverables relative to expansion of broadband investment in the County.
- Expand the County's Department of Information Services responsibilities to include more activity with respect to the telecommunications focus group and economic development. The IS Director should be intimately involved in both tasks.
- Develop a platform to expand telecommunication competition.
    a. Identify opportunities for Aggregation of Demand which will demonstrate sufficient business to attract investment.
    b. Form a telecommunications coalition which will create collaborative opportunities to band together the various organizations in the County.
- Promote and support the development and participation of seminars and workshops on broadband and telecommunications within the County.
- Consider the Use of County-wide Franchise Agreements.
- Develop programs and partnerships that incentivize investment,
    a. Consider County assets and other desirable components such as Rights of Way to incentivize investment
- Consider the Community Based Open Access Fiber Model. ECC considered the development options of a municipal based Open Access Model. At this point we believe such a program might be sustainable in the eastern portion of the county but would become a burden to the taxpayers if expanded to the central and western portions. If improvements are not seen via short term initiatives then this would be a consideration for longer term options. Additional information can be provided on this if desired.

Typically these recommendations have varying degrees of investment resources and phasing. The County should evaluate the recommendations for their economic impact realizing the county's overall goals for economic development and improved quality of life.

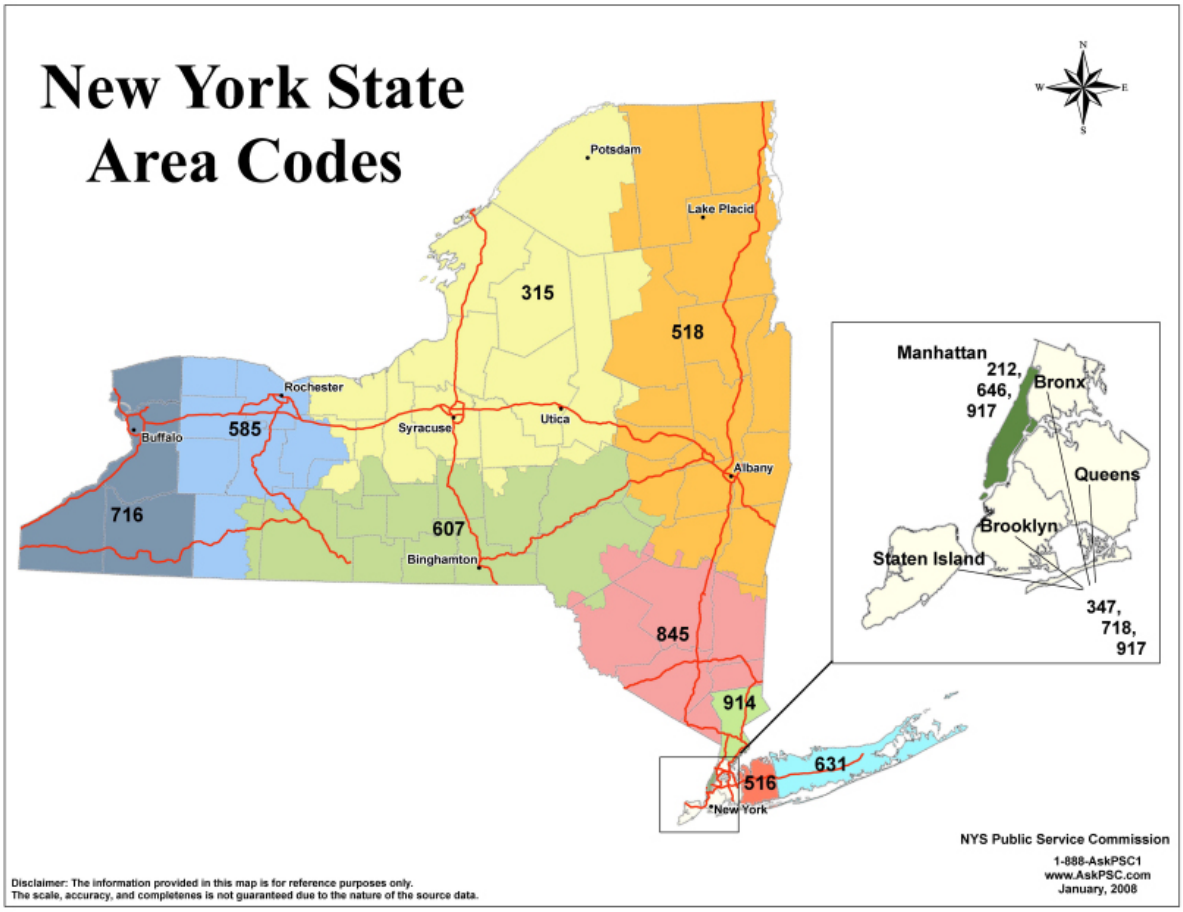
Recommendations should be evaluated to encourage public private partnerships, private telecommunication service provider investment in fiber, wireless infrastructures, and digital technologies that result in improved and competitively priced services. Longer term community network infrastructures should also be evaluated for opportunities to improve economic development and community access to competitively priced telecommunications services.

Each of the recommendation should be considered as potential solutions for meeting the county's short and long term goals and be evaluated for costs, economic impacts and benefits to the community.

2.0 Greene County Telecommunications Study

2.1 Greene County Calling Areas & LATAs

Greene County is located within the (518) area code and the Region's Local Access Transport Area - LATA 134.

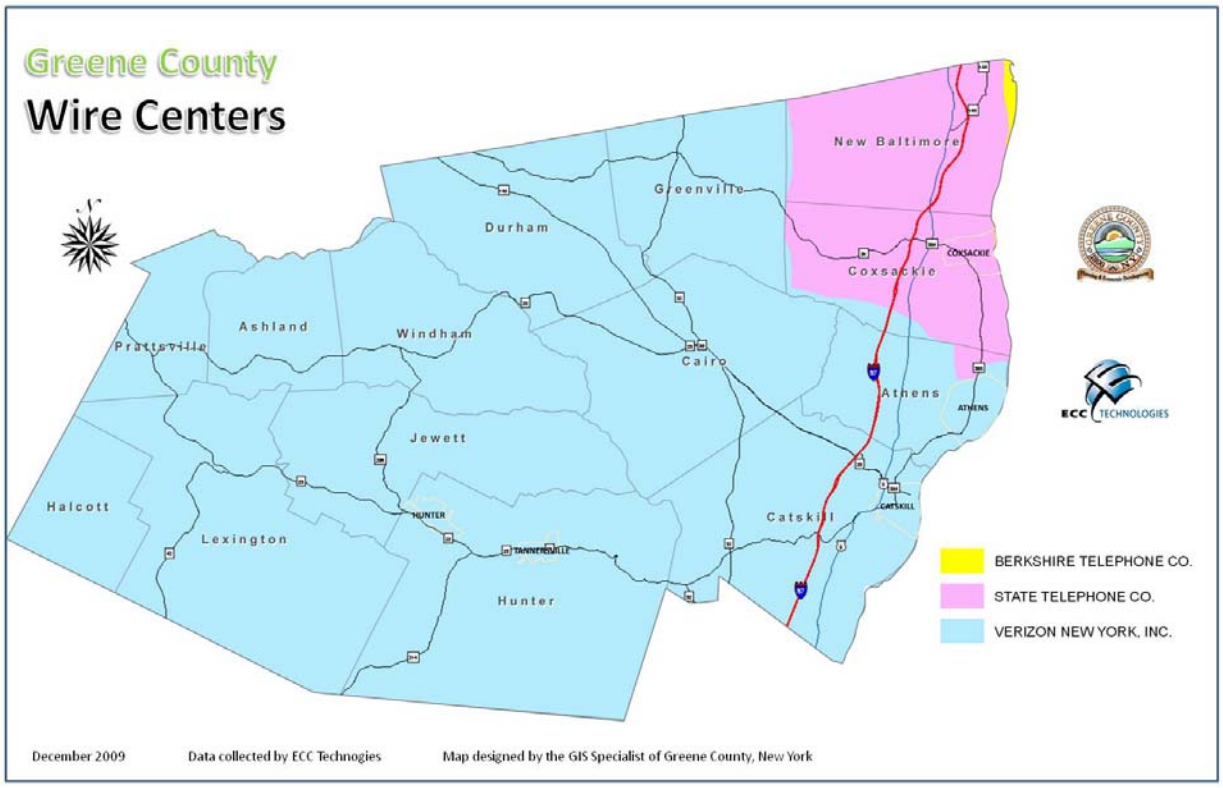


2.2 Telecommunications Wire Line Services

Local Exchange Carriers (LECs)

A LEC or local exchange carrier is a telephone company that offers local and long distance telephone service within a defined region referred to as the LATA - Local Access & Transport Area. Service to points outside the LATA is provided by inter-exchange carriers (IXCs) commonly referred to as long distance service providers. Local Exchange Carriers can be either an ILECs or CLECs.

An ILEC, or Incumbent Local Exchange Carrier, provides telephone services within a local calling area. Therefore, the ILEC is responsible for the development, maintenance and support of telephone cabling infrastructure necessary to provide telecommunications services within that calling area. In the Greene county region, Verizon is the dominant Incumbent LEC in the county and operates 10 of the 12 COs.



State Telephone Company

Corporate headquarters is located at 46 Reed Street in Coxsackie, NY. This organization has coverage in the northeast area of the County. State Tel has an extensive fiber network from their CO that feeds remote switches and several business parks in the area. Services that are also currently available are DSL, T1, T3, Frame Relay, Analog and ATM. GigE services should be online late Q2 or early Q3 in 2010. Though they currently do not offer service to lease dark fiber, State Tel stated they would evaluate on a case by case basis.

Verizon Communications

Verizon Communications was formed on June 30, 2000, with the merger of Bell Atlantic Corp. and GTE Corp. Verizon Communications Corporate headquarters is located at 140 West Street New York, NY. Verizon delivers broadband and other wireless and wire-line communications services to consumers, business, government, and wholesale customers. Verizon is a publically traded company and is listed on the New York Stock Exchange under the VZ symbol.

Verizon is by far the largest telephone company in the state and is the dominant incumbent telephone company in Greene County and covers approximately 90 % of the area. Verizon provides voice and data services to the areas that are in its territory. Services that are available in Greene County are Analog and basic ISDN. Through a search of their DSL locator website DSL is not available in some of their COs. Verizon systems have round-the-clock backup electrical power in the form of batteries and/or diesel generators.

Verizon has no plans to roll out any new DSL services in the future, however they did state that they would evaluate each request for a more robust service on a case by case basis.

Berkshire Telephone

Berkshire Telephone is an indirect wholly-owned subsidiary of Fairpoint Communications, Inc. Fairpoint is a publicly traded Delaware company headquartered in North Carolina. On April 16th, 2010 Fairpoint Communications filed for Chapter 11 bankruptcy reorganization plan. This will not affect Berkshires ability to provide service to its existing customers. Service to any customers of Berkshire will continue without interruption and at the same rates and terms currently provided. Berkshire has a small presence in Greene County however due to the recent developments with Fairpoint Communications we do not intend to elaborate any further other than to say Berkshire does serve the county in a very small section in the upper northeast portion of New Baltimore.

Pricing

Standard pricing for business class lines typically range from $15.00 to $35.00 per line depending on added features[2]. Large installations are priced on an individual case basis (ICB). Usage rates are priced on destination area.

To provide a reference in terms of size the following chart represents the ILEC in the region compared by number of lines in the state.

Local Exchange Companies Ranked by Local Service Line State Wide[3] (December 2004)

Company	Lines
Verizon-NY	9,557,469
State Telephone Company	8,777
Fairpoint Communications (Berkshire Tel)	6,562

[2] Verizon's NYS OGS rate for a measured business line is $15.74 /monthly fee + $6.44 FCC charge, $1.21 FUSF = $23.39

[3] Number of lines from 2002.

LEC Territory – Central Offices

Telephone infrastructure in the County is primarily supplied by the two (2) ILEC organizations (Verizon and State Telephone). A total of 12 central offices were identified across Greene County. Berkshire Tel provides service to a very small portion of New Baltimore out of a CO located in Columbia County.

Each CO is unique in that they offer varying levels of bandwidth services and network technologies. A breakdown of territory and contacts is listed below.

Incumbent Local Exchange Carrier (I-LEC)		
Company Name	**Contact Name**	**Contact Phone Number**
Verizon	**Kathy Cantanzarite**	**(315) 532-8848**
State Telephone Company	**Mark Evans**	**(518) 731-6128**
Berkshire Telephone Corp.	**Sales**	**(518) 758-9941**

LEC Services

A varying range of telecommunications services are available from the incumbent local exchange carriers at each central office (CO) location within the County. The services at the CO can include voice lines, ISDN, DSL, T1/DS1, T3/DS3, Frame Relay, ATM, and Gigabit Ethernet. A detailed inventory of the services offered through each LEC's central office, is provided later in this section.

CLECs

A Competitive Local Exchange Carrier (CLEC) is a telephone company that competes with the incumbent telephone company in the incumbent's territory. The formation of these organizations was a direct result of the Telecom Act of 1996.

There are three basic types of CLECS:

Reseller CLEC - A resale CLEC purchases LEC services and resells them to their customer.

Switched Based CLEC - A switched based CLEC purchases the use of the ILEC cable plant and last mile connection but has its own switching equipment located at a Central Office. The switch can be located either inside the territory or outside which will utilize an "extended link" or leased line from the incumbent. Extended link service is more expensive and therefore less competitive.

Switched and Facilities Based CLEC - A switched and facilities based CLEC owns the switching equipment and cable plant infrastructure to provide services independent of the ILEC.

The following example illustrates how the three (3) types of CLECs might set their pricing strategies. (The ILEC sells dial-up line and service to a customer for $12.00 per line.)

1) A resell CLEC buys dial-up line and service from the ILEC for $10.00 and resells it for $11.50.

2) A switched based CLEC buys the dial-up line only for $8 and sells line and service for $11.00.

3) A switched and facilities based CLEC owns equipment, cabling and sells service for $10.00.

AT&T Local

AT&T Local has a main business office location at 1205 Schenectady Road in Latham, NY that supports the region. AT&T is headquartered in Dallas Texas and boasts over 280,000 employees worldwide. The company's U.S. wired network capabilities encompass 49 million access lines and subscribership of over 17 million. AT&T Local has taken the stance not to provide current CO locations or exact services offered in current collocated CO's in Greene County as a matter of corporate security. However, they did say the services available range from MPLS, T1, T3 connections.

Paetec Communications Inc.

Paetec Communications has business office locations in Albany, NY that supports the region. Since its recent merger with McLeod USA, it has nearly doubled its size to 2500 employees. The combined company serves over 47,000 enterprise customers nationally. Paetec delivers service to business-class customers in more than 80 percent of the nation's top 100 metropolitan areas. Paetec services include data, voice, and Internet communications services. In addition, they can provide data center solutions, communications management software and financing programs.

In Greene County, Paetec focuses on general businesses, government and education.

Competitive Local Exchange Carrier (CLEC)			
Company Name	**Contact**	**Type of CLEC**	**Phone Number**
One Communications	**Sales**	**Extended Link**	**(866) 307-1226**
Paetec Communications	**Kevin O'Keefe**	**Extended Link**	**(585) 413-2325**

AT&T Local	**Sales**		**(518) 785-0687**
Tech Valley Communications	**J. Robert Daggett**		**(518) 598-0900**

Other Providers
In addition to the traditional telephone companies serving the county, there are a number of other types of telecommunications providers; the long distance service provider, the network provider, the Internet provider, the wireless and the satellite service provider.

Inter-Exchange Carriers (IXC)
An IXC is an organization that provides long distance services in a certain area. Communities in the region have several competitive options for long distance services. The larger carriers in the region include Frontier, Verizon, AT&T and Qwest. There are two (2) types of long distance services: calls within a Local Access & Transport Areas (LATA) and inter-LATA or calls between separate calling areas. All long distance providers in the study provide both types of long distance services through point of presence equipment (POPs). POPs are the physical access location interface between a local exchange carrier and an inter-exchange carrier (IXC). The following companies offer long distance services in the region.

IXC Services Long Distance, 800 and Calling Cards	Telephone No.
AT&T Local	(518) 785-0687
One Communications, Inc.	(866) 307-1226
Paetec	(315) 703-0006
Time Warner Cable	(866) 668-6044
Verizon	(877) 288-9473
Tech valley Communications	(888) 832-4976

Cable Modem Service Providers

Mid-Hudson Cable
Mid-Hudson Cable provides cable TV, high speed internet and digital phone service to residents and businesses mainly in the central and eastern part of the county. Mid-Hudson in cooperation with the county has developed an engineering plan for last mile infrastructure build-out and has submitted an application to the federal government for stimulus funding under the Broadband Initiative Program (BIP) through the Rural Utility Service (RUS). Mid-Hudson is developing a plan to offer fiber to the home should the Stimulus request get funded. Mid Hudson offers triple play services throughout their service territory.

Mid Hudson's basic internet rate is 384K upload and 5 meg download; for a slight fee users can double or triple these speeds.

Time Warner Cable

Time Warner Cable (TWC) is the second largest cable operator in the United States providing service to more than 14 million customers. Time Warner Cable provides high speed Internet and digital phone service to a large area of the county. They provide both residential and commercial based services.

Road Runner High Speed Online is Time Warner Cable's Residential High Speed Internet service and is offered in four speed tiers: Road Runner Lite (768Kbps), Road Runner Basic (2Mbps), Road Runner Standard (7Mbps) and Road Runner Turbo (15 Mbps bursting up to 22Mbps), and is available wherever cable TV service is available.

Time Warner Cable Business Class offers several tiers of High Speed Internet access via cable modem up to 10 Mbps and offers fiber based services from 3Mbps to 1Gbps. Recently, Time Warner Cable launched Business Class Ethernet service which utilizes cable modem technology in a point to point and point to multipoint configuration. Bandwidth for this service is from 512Kbps to 2Mbps and was created to directly compete with T-1 private line services.

Digital Phone service is provided nearly everywhere cable TV services are offered. Time Warner Cable Business Class offers Voice over IP (VoIP) telephone service to businesses requiring from 1 – 12 lines. They can provide service to businesses requiring more than 12 lines on an individual case basis. TWC has recently added Primary Rate Interface services to its business suite of products. This gives TWC the ability to provide services to companies with PBX phone systems.

TWC has an extensive fiber network throughout many high population residential neighborhoods. Standard construction guidelines call for infrastructure builds in areas with a minimum of 12 homes per mile. Since Business Class Services have not been a major focus of the company until recent years, some office parks and business locations have yet to have facilities built to them.

Officials from the company have confirmed that capital budgets for infrastructure builds have been severely cut in 2009. It is still unforeseen as to what projected infrastructure builds are expected for 2010. As of 2009, they did not anticipate any new investment in infrastructure builds in the county in the foreseeable future. The company is focusing its efforts on deploying switched digital technology which will allow them to more efficiently utilize bandwidth to deliver services through existing infrastructure.

Table 2 - CATV and Cable Modem Service

State Contract Pricing

Time Warner Communication's business solution (Road Runner) service is $74.95 per month for 5Mbps download and 384kbps.

			DOWNLOAD SPEEDS
Time Warner Cable			
(TWC Central NY)	Roadrunner	Cable Modem	512Kbps – 22Mbps
Mid-Hudson Cable	Internet Access	Cable Modem	384Kbps – 5Mbps

CABLE TV SERVICE AVAILABILITY BY TOWNSHIP	
Town	**CATV Franchise**
Lexington	TWC
Jewett	TWC
Hunter	TWC
Prattsville	Mid-Hudson
Windham	Mid-Hudson
Durham	Mid-Hudson
Cairo	Mid-Hudson
Catskill	Mid-Hudson
Greenville	Mid-Hudson
Athens	Mid-Hudson
Coxsackie	Mid-Hudson
New Baltimore	Mid-Hudson
Halcott	N/A

Internet Service Providers (ISPs)

A LEC that is also an ISP can offer 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, ISDN, T1, DSL, etc.). With numerous local and national providers of dial-up the choice to residents and businesses is large; however the choice of high bandwidth Internet is not.

Internet service providers (ISPs) are dependent for the most part on the LECs and IXCs infrastructure. 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 cable modem service to the home or business. Internet service providers offer their services in one of two ways: by using wire line infrastructure such as telephone or cable TV, or by using wireless infrastructure such as towers and satellite.

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 has a maximum speed of 56 Kbps. Customers within two (2) to three (3) miles of a telephone company's central office equipment can use digital subscriber lines (DSL) for Internet speeds between 128 Kbps to 1.5 Mbps. Higher bandwidth connections are available depending upon infrastructure available, such as cable modem, T1, frame relay, SONET, and Ethernet connections.

ISPs Listed in Local Phonebooks for Greene County

Global Crossing	(800) 482-4848
Level 3 Communications	(877) 453-8353
Mid-Hudson Cable	(518) 943-6600
Paetec Communications	(315) 703-0006
Time Warner Cable	(866) 668-6044
Verizon Communications	(800) 288-9473
Tech Valley Communications	(888) 832-4976

*This above information is misleading. Having contacted the providers in the phone book, we've learned that some of the listed providers in fact do not have a presence in Greene County.

Voice over Internet Protocol (VoIP) Providers

A Voice over Internet Protocol (VoIP) provider uses existing broadband Internet connections (cable TV phone service is a VoIP service) to provide local and long distance telephone service to their customers. By using an adapter box that converts a regular analog voice signal into a digital signal, conversations are sent over the Internet as opposed to the traditional way, over the public switched telephone network (PSTN). Since this is done over existing customer leased lines and Internet services, the price for this service can be significantly less than typical ILEC voice service. There are potential issues with this technology however, one drawback of this service can be the porting or transfer of existing telephone numbers. For VoIP providers to convert existing telephone numbers in a particular area they must first establish agreements for numbers in that particular area's rate or calling center. In some instances, when these agreements are not in place, businesses have been assigned business numbers that are not part of a local area code and exchange. Emergency 911 calling can also be an issue, as the portability of the VoIP device calls cannot be traced back to the source. It is recommended that all VoIP users register their location with their service provider prior to service conversion.

Vonage America, Inc. is a VoIP provider that offers consumers and small business VoIP Internet phones and service. They provide their own account subscription, maintenance, billing, and customer care. In recent years, Vonage has encountered legal and financial difficulties and it is uncertain, with the bundling services coming from the telecom and cable industries, what the future holds for this company. The following table describes the typical Vonage rates for residential and business customers.

Vonage
Contact Info: Edison NJ 1(800) 647-9275

Residential Plan

- $24.99/month Premium Unlimited Plan - Unlimited local, regional, US nationwide long distance, and calls to Canada.
- $14.99/month Vonage Basic 500 Plan - 500 minutes of US nationwide long distance, local and regional / 3.9¢ per minute after the first 500 monthly minutes.

Small Business Plan

- Business Premium Unlimited Plan - $49.99/month
- Business Basic 1500 Minutes Plan - $39.99/month

Table 3.8 – Vonage VOIP Rates

Interconnect Network 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 as defined by the FCC are data communication services that support download transmission rates of at least 756 Kbps. Telecommunications carriers provide high bandwidth services through a variety of technologies. Most network service providers can offer T1, ISDN, Frame Relay, and SONET services in the developed and partial developed areas of the County.

Pricing
Network service costs are impacted by the distance to a central office or Point of Presence (POP) location. Services are priced on an Individual Case Basis (ICB).

Broadband over Power Lines (BPL)
BPL utilizes radio frequencies over the local power company's electrical lines to provide Internet access, and other communications services. In recent years, this technology has been debated due to its inherent potential for interference with amateur and emergency radios and ability to sustain profitable business models for implementation. At this time, there are less than 5000 subscribers in the United States using this service.

Due to its low adoption rate, providers of BPL are small startup companies that have a limited numbers of customers and unproven long term business models. However, recently IBM Corporation has announced a partnership with a third party company called International Broadband Electric Communications Inc. to develop BPL access to rural areas. Rural areas have been targeted mainly due to the fact that they typically do not have the traditional telecommunication infrastructure needed to provide broadband access.

New Visions Power Line Communications is based in Syracuse NY and has a service called Blink that claims to have a download speed of 20 Mbps and an upload speed of 7 Mbps. The New Visions service utilizes fiber optic infrastructure as a backbone and delivers "last mile" service via the incumbent electrical service provider's infrastructure.

2.3 Wireless Services

Wireless Communications

Wireless communications utilize radio frequencies (RF) from 400 MHz to 38 GHz. Generally speaking, the higher the frequency, the higher the bandwidth, however the higher frequencies typically provide less coverage. Also lower frequency radio transmissions tend to provide broad reception, where high frequency microwave frequencies are typically used as point-to-point line of sight transmission. Wireless communications includes radio dispatch, paging, cellular telephone, digital telephone, data, and Internet services. In addition to these services, the tower/antennae infrastructure also supports line of sight communications such as microwave.

Cellular Service Providers in Greene County

In the STW region cellular telephone and digital mobile service is primarily provided by AT&T Mobility, Sprint/Nextel Communications and partner IPCS and Verizon Wireless. These wireless companies are expanding services to include wireless Internet access. Presently many of these companies are making infrastructure upgrades from current 2G wireless networks to next generation 3G network technology.

<u>AT&T Mobility</u>
AT&T Mobility's main business address for the region is in Glenmont, NY just south of Albany.

AT&T has 13 wireless access locations that serve Greene County. In Greene County AT&T is currently using T-spans, fiber from existing carriers and installing Ethernet across the state to provide even faster than industry leading 3G speeds as well as preparing for 4G deployment. They offer voice services based on GSM technology, and data and Internet based on EDGE/GPRS technology (a 2.5G technology) from many cell towers in the area. AT&T is moving to 3G at 850 Mhz for better propagation at all towers. However, AT&T could not confirm a specific timeline as to when 3G network upgrades where to be made in the county.

Verizon Wireless

Verizon Wireless has a main business location for the region in Albany, NY. We are still waiting for feedback from Verizon Wireless. Below represents typical information from Verizon. ECC will confirm and update this information when it is made available to us.

Verizon Wireless tower connections are typically copper T1 based with some microwave backbone technology. From these towers Verizon Wireless offers Voice, Data and Internet access services. The Internet access is a mix of 2.5G and 3G technologies. Verizon tower sites are generally equipped with back up batteries and /or fuel powered generators. According to the Verizon Wireless coverage website they have digital, enhanced and mobile broadband based coverage in approximately 85% of the region with a few no coverage areas in the central and western parts of Greene County. We are waiting for information to confirm if Verizon Wireless has any plans for improving coverage in the region.

In addition to the major providers, there are a number of reseller companies that provide choice and competitive pricing. Shown below is a list of these providers.

Wireless Providers	
Company	**Phone Number**
AT&T	866-662-4548
Radio Shack	(518) 943-4984
Sprint Store	(845)-336-0780
Verizon Wireless	(518) 943-7800
NYAir	(518) 966-4747

Cell Tower Owners

In the region, there are 12 towers registered with the FCC for cellular service. The tower owners lease tower space to wireless companies for their equipment and service access point. In some cases the towers are owned by the service providers themselves. The majority of towers are located on major roadways and in population centers. The service coverage of a single cell tower is up to a 10 mile radius, therefore the placement of these towers and how they are linked is critical to the type of coverage available.

Satellite Communications

Satellite service is an option for deploying telephone, data, and Internet services to areas with limited landline infrastructure or poor line of site for wireless communications. For customers that do not have access to CATV, they have the option of installing satellite dishes to receive television channels and Internet access. New dishes can support both TV and Internet communications simultaneously.

Hughes Network Systems, Spacenet, Inc., and WildBlue Communications, Inc. offer satellite based Internet access, data, and voice services. Over the past few years satellite Internet access has increased in download and upload speeds, but it is still not recommended for some time sensitive (micro-second) Internet applications such as VOIP, some VPN technologies, video gaming, and conferencing.

Pricing

Residential and small business cost for service is currently about $600 - $1000 for installation with $49 - $200/month service charges depending on the user subscription data speeds.

Satellite Providers

Hughes Network System

Hughes Network Systems provides satellite service solutions for residential, small business, enterprise, government and service provider customers. Hughes Net (formerly Direcway) provides two-way satellite service plans from 700 Kbps to 2 Mbps download speeds.

Wild Blue Communications

Wild Blue Communications provides satellite service for residential, business and government. Wild Blue offers two-way satellite service with download speeds up to 1.5 Mbps and upload speeds up to 256 Kbps.

Satellite Service Providers		
Company	**Location**	**Phone Number**
Hughes Network Systems	11717 Exploration Lane Germantown, MD 20876	1-800-428-9570
Wild Blue Communications	5970 Greenwood Plaza Blvd., Suite 300 Greenwood Village, CO 80111	1-866-974-7174

Table 3.11 – Satellite Service Providers

Wireless Internet Providers

NYAir

NYAir is a small wireless based access company with a main business location is 207 Jefferson Hts. Catskill, NY 12414. NYAir provides wireless dial-up Internet and broadband connectivity as well as VoIP services. NYAir is a high-speed Internet access service for homes, home offices and small offices. They are currently getting 15%-20% penetration into areas of the county. They are exploring wireless applications to cover as much of the county as possible and hope to have the entire county covered in the future.

NYAir feels they have enough wire based infrastructure built in the county and does not have plans for any extension of their current infrastructure. They have also raised their homes per mile requirement for service due to satellite dish contracts outstanding.

Additional Infrastructure

Area County Public Safety and Emergency Management System (EMS)

These types of systems typically support mobile and portable radios for Fire, Highway, Ambulance, and Police communications

The Greene County PSAP/E911 and Sheriff Dispatch is located in the Public Safety Building at 25 Volunteer Drive, Cairo, NY 12413. The EMS system is based on a six (6) tower configuration. Currently the system has approximately 85% County coverage for mobile communications and paging.

Greene County 911 would like to refresh the entire backbone system to fiber at all towers and new radio systems from towers to the field to support better coverage and higher bandwidth applications. It should be noted that Greene County was omitted from Albany County's bid for the Public Safety Interoperable Communications (PSIC) Grant Program. The County must replace equipment with P25 complaint units and become technologically viable in order to interoperate with surrounding counties.

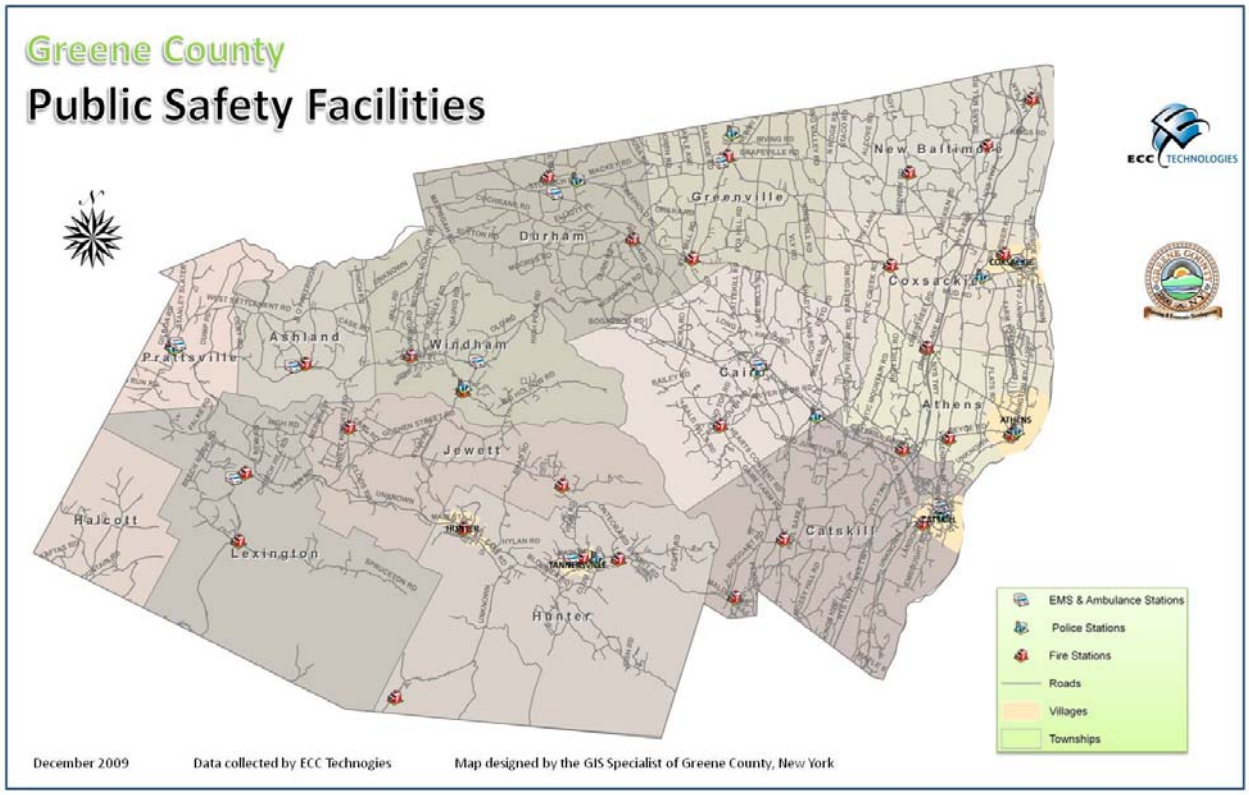
Greene County Public Safety and Emergency Management System (EMS)

The radio system is based on a fifty (50) year plus old 6 tower microwave and T1 configuration. Currently the system has approximately 90% coverage for mobile communications and paging across the county.

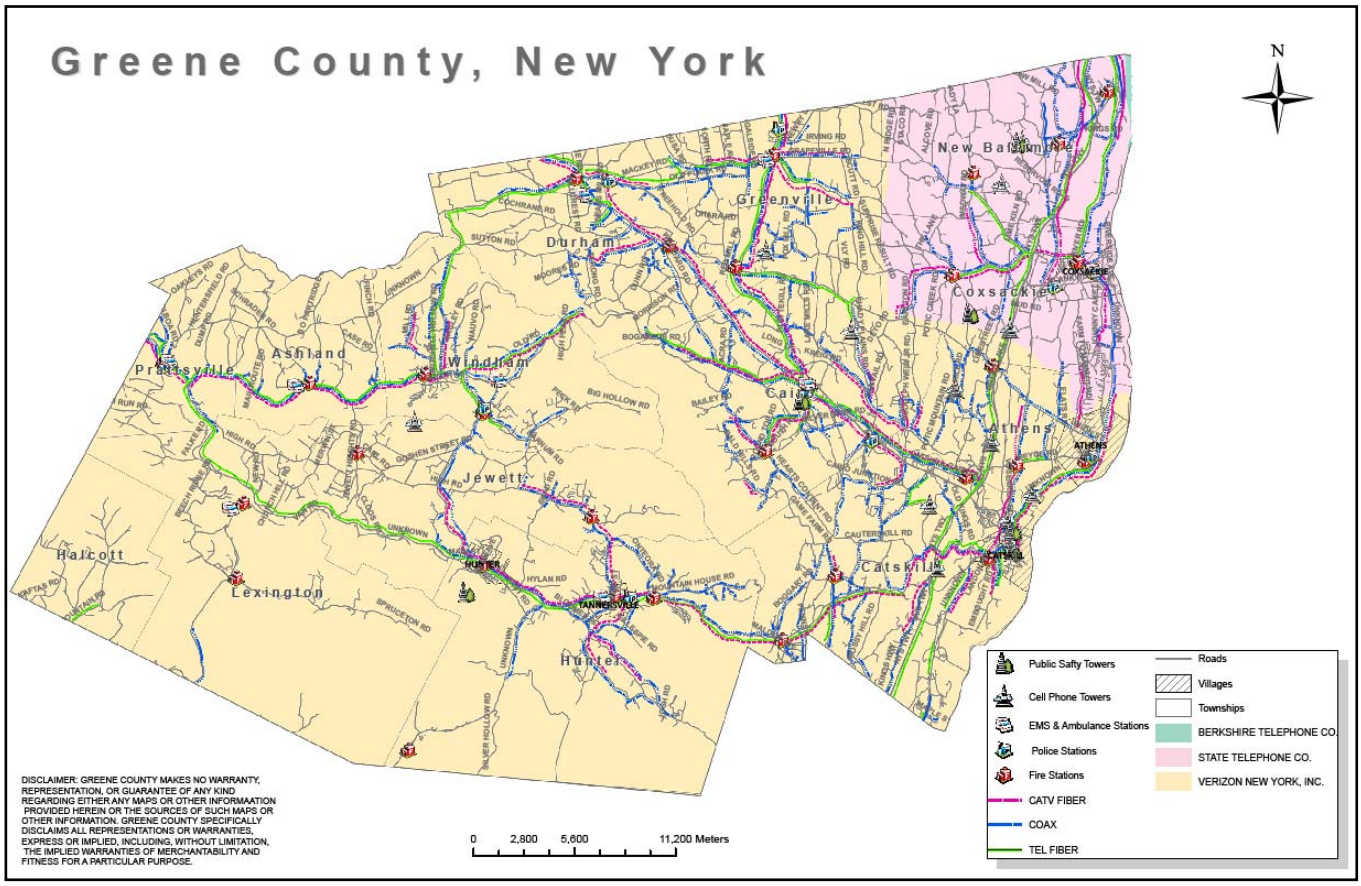
The communications system infrastructure consists of 6 tower sites which are leased by the County. The sites are located in the following areas of the County: Hunter, Catskill, Cairo, Coxsackie and New Baltimore. The above diagram depicts the public safety locations as well as cell tower information. The county is working with Mid-Hudson Cable to bring dark fiber connections to two of the towers. This will enable the county to launch updated technology, services and applications that require higher bandwidth while also alleviating the need for additional T1 connections and lowering costs.

The county is currently conducting a wireless study which is expected to be completed by the end of 2010. However, the county is not confident it will be able to follow any recommendations from the study. It feels it is too far behind with no dedicated funding source to bring them up to date with current technology.

Greene County Public Safety/EMS sites



Greene County Public Safety Towers/ Wire Centers



Regional Wide Area Networks

New York State K-12 Educational System Networks

The Greene County K-12 school districts include the following: Cairo-Durham School District, Catskill School District, Coxsackie-Athens School District, Greenville School District, Hunter-Tannersville School District, Windham-Ashland-Jewett School District.

The Northeastern Regional Information Center (NERIC) provides regional districts with a broad array of technical services. NERIC currently serves 12 counties and partners with seven BOCES in the region, including Questar III, which serves Greene County. In Greene County, NERIC provides services to Catskill CSD and Cairo-Durham CSD. There is a GIG-E connection from NERIC to Catskill CSD and Cairo-Durham CSD. This enables NERIC to provide Distance Learning and Internet connectivity to both districts. Other services provided are applications that pertain to financial, student information, scoring, data warehousing and other data collection and management. NERIC gets its service provided by Tech Valley Communications.

Tech Valley Communications is an Albany, NY based CLEC which was formed in 1999. Tech Valley offers long distance voice services as well as data, high-speed and dial up internet services. Currently Tech Valley employs approximately 50 people at various offices in the downtown Albany area.

According to Questar III's website, they provide more than 250 instructional and support services to 23 school districts with about 40,000 students in Rensselaer, Columbia and Greene counties of New York State. In Greene County, Questar III provides services to Greenville CSD, Coxsackie-Athens CSD, Catskill CSD, and Cairo-Durham CSD. Requests for information regarding specific service provided to school districts have not been returned. ECC will update information when it becomes available.

Otsego Northern Catskill BOCES serves Windham-Ashland-Jewett CSD as well as Hunter-Tannersville CSD. They currently provide Windham-Ashland-Jewett CSD (WAJCSD) with a fractional T1 connection used for distance learning and video conferencing. WAJCSD obtains internet connectivity from Mid-Hudson Cable via cable modem and Paetec provides telephone POTS service. As the WAJCSD has only one building in the district there is not a need for networking multiple buildings and the cable modem service currently provided is suitable for the districts needs. A major need for the district is the ability to connect students and parents with teachers and the district after school hours. This will give the district the ability to communicate through email, assign and grade homework, and offer students after school help. WAJCSD would also like to assign wireless laptops to students. However, the coverage in the community is not strong enough to warrant such an expense.

ECC has also found that Broom-Tioga BOCES, and from a larger standpoint South Central Regional Information Center (SCRIC), serves Hunter-Tannersville CSD. SCRIC provides a fiber connection from Time Warner Telecom to the main building in the district; which is then connected via fiber to the second building. Being located in the southern/central portion of the county, the basic access to broadband is not available to many of the residents. Hunter-Tannersville would like to see more access (either wireless or hard wire) to its residents. This would allow more applications to be readily available to students, teachers and parents.

In conclusion Greene County's school district is made up of three BOCES (Otsego Northern Catskill, Questar III, and Broome-Tioga BOCES) and is served by two Regional Information Center's (Capital Region RIC and Northeastern RIC). This is a unique arrangement for any county and requires extensive collaboration between many entities.

BOCES

Throughout New York State, the Board of Cooperative Educational Services (BOCES) system has been a leader and developer of wide area networks (WANs) that connect individual school districts across the state together. In addition to district-to-district connectivity, these networks are also connecting individual schools to the rest of the world via Internet access and carrier based solutions such as private ATM and gigabit networks.

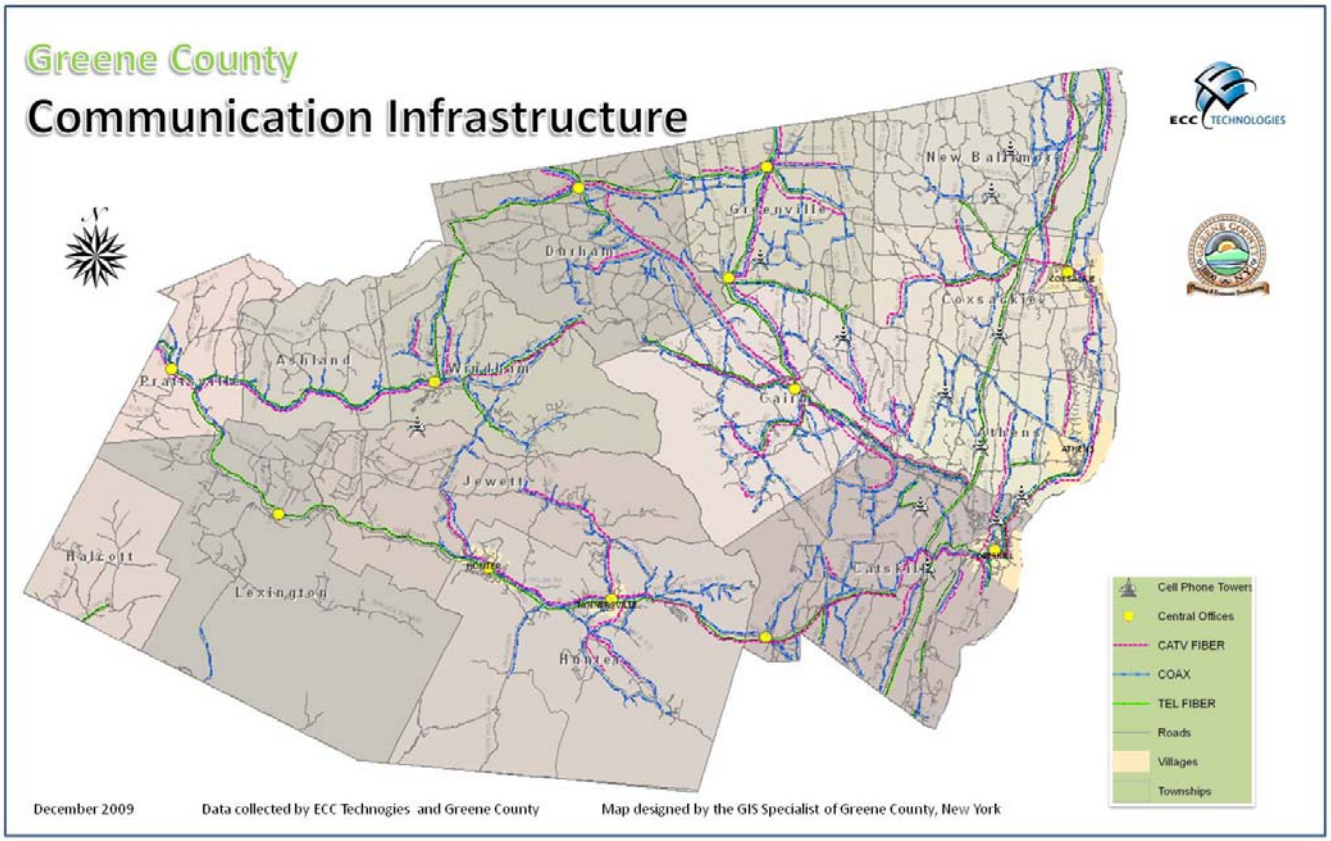
Through the use of cooperative bidding and aggregation of demand, the BOCES has been able to provide affordable services into areas of the region that otherwise would not be able to do so. Some of the wide area network (WAN) based programs that BOCES offers include distance learning programs, email, Internet access, and data networks for financial, student and administrative uses.

The Northeastern Regional Information Center (NERIC) located in Albany, NY provides technical solutions and support for one or more BOCES and their component school districts in a specific region. Services provided include but are not limited to Instructional Services, Data and Application Services, and Network/Infrastructure Services.

2.4 Central Offices and Fiber Routes

The three (3) ILEC territories are displayed on the regional map following this section. The telecom companies' central offices are located (approximately) in the center of each of the wire center boundaries. As discussed earlier, telecom fiber optic cable is evident throughout the region and is used to connect central offices, provide out of the region long haul connectivity and aggregate copper wire facilities. When possible and financially feasible the ILECs have connected the COs in a ring configuration thus creating physical redundancy and increased service reliability.

Greene County Central Office Locations/ Infrastructure Map



3. 0 Needs Assessment

3.1 Introduction

As part of this Study, ECC met with and interviewed several different groups in the County. The main focus of these meetings was to determine the collective telecommunications needs of the County's members. These focus group meetings established a forum for open discussion.

For this reason, individuals that represented healthcare, educational and government entities were gathered and interviewed. The following section details the topics of discussion and a summary of the information obtained in each of these meetings. This information was used to assess the current state of telecommunications needs and uses that information to compare against the level of infrastructure and services available discovered in the inventory phase.

In addition to the high bandwidth users, key telecommunications service providers in the area were interviewed to understand their current and future infrastructure plans and needs. The interviews focused upon how each organization would benefit from an open access fiber infrastructure, if it was made available.

Assessment Interviews / Meetings
ECC interviewed key County personnel, public entities, and private business organizations, documenting current and future Internet use and identified a number of locations requiring connectivity in the County. A summary of each group is shown below. Some of the organizations interviewed include:

- County IT, Public Safety / EMS
- County ED
- BOCES
- Service Providers such as Verizon Wireless, TW Telecom

3.2 Healthcare

No hospitals are located in the county. Healthcare providers send patients for critical care to Albany or Columbia counties. In speaking with some of the healthcare providers in the county, access to higher bandwidth is critical in keeping current in the medical industry. More information going electronic will increase the need for higher bandwidth connections. These connections are currently not present in most areas in the county.

3.3 Public Safety

Historically speaking, due to cost and other factors, most 911 communications backbone systems over the past 20 years have been upgraded to higher capacity microwave technology. Although current microwave technology is much better than previous versions, it is still very limited as compared to fiber.

Greene County public safety and EMS services have not experienced a significant infrastructure upgrade in many years. The county is currently working off a radio system that was installed in 1951. The County is currently dependent upon Verizon tie lines for communications. In 2007, the federal Department of Homeland Security (DHS), in coordination with the Department of Commerce (DOC), released the PSIC grant. The PSIC was a one-time formula-based, matching grant program intended to enhance interoperable communications with respect to voice, data, and/or video signals. PSIC provides public safety agencies with the opportunity to achieve meaningful and measurable improvements to the state of public safety communications interoperability through the full and efficient use of all telecommunications resources. One of the key deliverables of the PSIC grant program was the development of the Statewide Communications Interoperability Plan (SCIP). The NYS Office of Homeland Security (OHS) coordinates with the State's Office for Technology (OFT) and local units of government to ensure that communications capabilities are developed and maintained throughout the State. Due to the fact that Greene County is currently using legacy systems, the county is not able to interoperate with surrounding counties. Albany County omitted Greene County from the PSIC (SCIP) grant application. The result of this is that Greene County is rapidly becoming an island. Greene County's radio system was installed in 1951 and will be swapping out low band technology. The public safety radio network is comprised of six (6) towers located in Hunter, Catskill, Cairo, Coxsackie, and New Baltimore. T1 connections are used as the backbone to connect these towers. The County is currently paying roughly $66,000 per year to maintain these connections. With the rapid advancement of technology in the public safety arena, Greene County does not currently have the network backbone to deploy critical applications to vehicles, officers, EMS personnel, ambulance and fire. The fire departments currently work on four channels, expansion of these channels is critical to ensure communications for the entire county.

Public Safety Towers

Based on the current public safety infrastructure in the county, the long term strategy should be to deploy dark fiber connections to the towers via acquisition or construction. Though a phased approach will be needed; deploying a more robust connection will ensure that applications needed to ensure critical incident management and day-to-day operation will progress. Mid-Hudson Cable will play a key role in deploying this network upgrade. This public/private partnership will encourage telecommunications infrastructure investment in the community as well as cement the county's commitment to ensure quality public safety services.

Providing fewer connections to the towers will make sure costs do not become a burden to the county. Instead of adding more T1 connections to meet the needs of efficiently communicating, dark fiber connections can provide a more robust connection in which multiple applications can be added to a single line. This will allow the county to apply more funding to upgrade existing fire and EMS radio equipment, deploy public safety applications, and keep officers out in the field longer.

Table 1 on the following page compares fiber to microwave technologies.

Table 3: Fiber vs. Microwave Comparison Chart

Fiber vs. Microwave Comparison Chart		
	Fiber	**Microwave**
Transport / Media	Laser / Optic Cable	Radio / Wireless
System Capacity	Unlimited	155 Mbps
Number of Strands	72	N/A
Reliability	99.999%	99.999%
Expected Useful Life	25 + years	5 to 7 years (due to limited capacity)
Expansion & Future Proof	Yes	No
Infrastructure	Aerial on Telephone Pole	Radio Towers
Topology	Redundant Ring	Hot Spare (duplicate equip)
Advantages / Disadvantages	**Fiber**	**Microwave**
Pros	Open Access Infrastructure- unlimited capacity available to multiple users	Convenient
Cons	Susceptible to pole hits, high wind and ice storms	Closed Infrastructure -- limited in bandwidth and number of users / susceptible to high wind and ice storms

4.0 Incumbent Meetings

Service Providers

As part of the assessment process it is important to understand the number of service providers that would be interested in public / private partnership and collaborative infrastructure programs. Ideally these organizations would use the fiber to provide telecom services into areas of the county that lack broadband access today and bring greater levels of competition and better services to those that have access.

Cellular Industry & WISPs

With the changeover that is occurring in the cellular industry from second generation 2 (G2) to third and fourth generation 3 and 4 (G3 & G4) wireless technology, an increase in bandwidth to the towers will be necessary to support the enhanced services offered by the cellular providers. G3 allows simultaneous use of speech and data services at higher data rates than G2 (up to 14 Mbps download speed and up to 5.8Mbps upload speeds).

Table 2 and table 3 identify the cell towers in Greene County that currently support Sprint/Nextel and AT&T services. **Verizon wireless did not provide information. This will be updated should they respond.**

Sprint / Nextel

Below is the list of Sprint's 10 sites located in Greene County.

Sprint CDMA Towers in Greene County		
Tower Name	**Tower Address**	**City**
Coxsackie	224 Lime Kiln Road	Coxsackie
New Baltimore	13800 Rte. 9W	New Baltimore
Windham	33 Clarence D Lane	Windham
Hunter Mt.	23A Hunter Mountain	Hunter
Catskill	140 Black Lake Road	Catskill
Greenville	820 Sunny Hill Road	Greenville
Hunter	64 Klein Avenue	Hunter
Catskill2	3108 Old Kings Road	Catskill
Hamburg Rd.	57 Hamburg Road	Catskill
Cairo	1545 Rte. 67	Cairo

AT&T Mobility

Below is the list of AT&T's 13 sites located in Greene County.

AT&T Mobility Towers in Greene County		
Tower Name	**Tower Address**	**City**
Athens	140 Black Lake Road	Athens
Cairo	Route 67	Cairo
Catskill	3108 Old Kings Road	Catskill
Catskill-NY06	62 Olympus Palace road	Catskill
Catskill Village	57 Hamburg Road	Catskill
Coxsackie	399 Cold Springs Road	Coxsackie
Coxsackie North	224 Lime Kiln Road	West Coxsackie
Freehold	888 Sunny Hill Road	Greenville
Hunter Mountain	Hunter Bowl	Hunter
New Baltimore	13800 Route 9W	Hannacroix
Surprise	443 King Hill Road	Greenville
Vedder Mountain	Easy Street Road	Catskill
Windham	Cave Mountain	Jewett

Clarity Connect

Clarity Connect is a NYS based wireless Internet service provider (WISP) that utilizes the incumbent's infrastructure to provide wireless internet service to remote areas. Clarity connect provides Internet access services to small business and residential areas that are typically unserved or underserved by the incumbent. They are often times however limited to entering a market by the unavailability of high capacity and affordable middle mile backbone infrastructure to support their last mile service. Clarity Connect is a relatively small organization with limited funds and in the past has relied on grant programs to fund projects of this nature.

Open access infrastructure would allow Clarity Connect to provide last mile services into the remote and unserved areas of this County, which we have determined to be favorable to our service. In most of the coverage areas across the state where CC provides service they have partnered with the local municipality to gain access to county owned towers at minimal cost to reduce expenses and provide sustainability of their business model.

CLECs

TW Telecom

TW Telecom (TWT) is a local CLEC based in Rochester, NY and provides Internet, MPLS, and T-1 and DS-3 transport / data services over leased lines.

Paetec

Paetec is a CLEC organization based in Fairport NY. Currently Paetec provides primarily data services to customers in Greene County. Paetec however can provide T1, T3, MPLS and Ethernet services to customers over leased fiber lines.

Incumbents

The incumbent providers namely Verizon and Time Warner Cable did not participate in the assessment process. Each stated they are satisfied with the level of infrastructure and services available in the county and do not see the benefit of addition fiber to their organizations at this time.

4.1 Fiber Needs Assessment Summary Points

There were a number of needs and issues reported during the investigative phase of this project that warrant an improvement in the County's current telecommunications environment. Chief among them were:

1) The County must replace a severely limited EMS backbone.
2) The County is lacking broadband and cellular service in rural areas, at the same time the wireless industry is looking to access remote and unserved areas.
3) The educational institutions are looking for higher and higher broadband service.

5.0 Open Access Fiber

Municipally owned infrastructure has gained in popularity across the country and has been described as a "model" system for NYS county development. This type of infrastructure can be either privately owned / operated or it can be created as an open access system. Private models are installed, operated, and used by municipal entities to make internal telecommunications connections. They often do not support external needs of non-municipal users. However a growing trend among private municipal fiber infrastructure is to expand into what is known as an Open Access Model (OAM).

Open access models refer to infrastructure constructed and made available to any and all organizations that wish access to it including the service provider industry. In this environment service providers will look to use the infrastructure to improve their telecommunications services and/or coverage. Typically these types of systems are developed through partnerships with the telecommunications industry where the community provides ownership, control, and governance and the industry provides service, operation, and maintenance. They are commonly revenue based and typically self supporting. Through the development of public-private partnerships, other organizations including the carriers themselves pay to use the fiber which in turn creates revenue to maintain the infrastructure.

Ideally over time, 100 percent of the operational costs are paid for by the users of the fiber infrastructure. A globally competitive advantage will be created within the County by the existence of a 21st century global economy based telecommunications infrastructure.

ECC reviewed Greene County for the potential of establishing a Municipal Based Open Access Model. Such a fiber model would require approximately 120 miles of cabling to be placed in strategic locations throughout the County. The eastern portion of the County may be able to sustain the fiber build but the central and western portions would not be able to sustain this model without additional taxpayer support.

The capital and annual operations costs would be as follows:

Bond Term (Yrs)	Bond Rate	Construction Cost	Bond Amortization Annual Cost	Annual O&M Costs	Capital Replacement Fund Annual Costs	Total Annual Costs
10	4%	$4,800,000	$583,172	384,000	$50,000	$ 1,017,172
15	4%	$4,800,000	$426,060	384,000	$50,000	$ 860,060
20	4%	$4,800,000	$349,045	384,000	$50,000	$ 783,045

Bond Term (Yrs)	Bond Rate	Construction Cost	Bond Amortization Annual Cost	Annual O&M Costs	Capital Replacement Fund Annual Costs	Total Annual Costs
10	6%	$4,800,000	$639,478	384,000	$50,000	$1,073,478
15	6%	$4,800,000	$486,062	384,000	$50,000	$920,062
20	6%	$4,800,000	$412,664	384,000	$50,000	$846,664

Bond Term (Yrs)	Bond Rate	Construction Cost	Bond Amortization Annual Cost	Annual O&M Costs	Capital Replacement Fund Annual Costs	Total Annual Costs
10	8%	$4,800,000	$698,847	384,000	$50,000	$1,132,847
15	8%	$4,800,000	$550,456	384,000	$50,000	$984,456
20	8%	$4,800,000	$481,789	384,000	$50,000	$915,789

6.0 Recommendations

With the announcement of the Federal Broadband Technology Opportunity $7.2B grant program, the importance of telecommunications services in general and broadband access specifically have come to the forefront. Many organizations across the country are developing plans to assess and improve their respective broadband access situation. To do that, they must first understand what they currently have available to them and where the gaps in coverage exist.

Through the process of this inventory study, we have discovered that Greene County is not unlike many upstate NY rural areas. The developed areas, such as villages and cities, are better served than the outlying regions. As illustrated in the maps included in this report, there are many areas in the County that do not have access to land based or wireless technologies, let alone choice of provider. Overall, the rural areas of the County are consistent with and comparable to other rural communities in the State. Having said that, portions of the County especially those in the central and western portions of the County, that are greater than ½ mile from major traffic corridors generally have no access to any advanced telecommunications services. This has a significant impact on the Counties ability to establish itself as a desirable location for home office professionals.

Through interviews with each of the major providers in the County, it has been made apparent that the service providers are anticipating very little activity and investment in the foreseeable future in terms of new services or infrastructure. The exception is Mid-Hudson Cable Company. They are planning on expanding current infrastructure with a roll-out of approximately three years.

We believe this project if funded will have a significant impact on the respective regions once implemented. At this point we believe this project is a good candidate for the Broadband Stimulus Program grants and are awaiting notification of Grant decisions.

The County has made an important first step toward understanding and developing their telecommunications resources as a community asset by the commissioning this study.

There are a number of measures that can be undertaken to continue the development of the County's telecommunications infrastructure, each with varying levels of resource commitments.

Maintain GIS Telecom Database:

- Update database periodically to remain current.
- Encourage carriers & service providers to use database as a clearinghouse.
- Encourage providers to alert the County of new coverage areas and services.
- Review annually FCC, PSC and telecom industry databases for updates.

Establishment of a telecommunications Focus Group to provide:

- Strategic planning and setting policy for the development of County telecommunications.
- Educate and inform public leaders and policy makers of telecom issues and concerns.
- Promote the County's Telecommunication Resources.
- Lobby PSC and telecom industry for County telecom issues and concerns.
- Coordinate County telecom efforts with other NY State regions.
- Identify and pursue telecom and broadband grants and other funding opportunities.

Expand Information Services Responsibilities to include:

- Economic Development telecommunications issues.
- Aggregating telecommunications demand with the goal of getting better service at a lower price.
- Exploring County-wide cable franchise agreements.

6.1 Develop Telecommunication Competition

Typically speaking, the more competitors operating within an area, generally equates to a greater distribution of telecommunications competition across all levels of the community. Within the County, telecommunications competitors perceive that there is not enough business to justify the investment.

A much more intensive marketing and sales program is needed to develop customers in a rural County. Typically, the results are often known as "aggregation of demand". The County can help fill this role of aggregating demand for telecommunications services. The telecom industry is much more likely to respond to opportunities that can be quantified and communicated.

There are a number of tactics the County can employ to aggregate demand, such as:

Telecommunications Coalitions

Create Telecommunications Coalitions which will include Municipal, Business, Healthcare and Educational Institutions working towards common goals. The more organizations involved the more likely telecom providers will be responsive. Coalition examples might include:

- Schools for distance learning & e-learning programs
- Healthcare organizations for telemedicine networks
- Business associations for cellular, long distance, and/or Internet services

Each coalition will need to develop a leadership council to quantify, document and communicate the opportunities to participants and the telecom industry. These can be structures similar to or an extension of the county's existing Broadband Coalition. There is another opportunity available to have the Chamber of Commerce act as the leadership liaison for a business coalition. The Chamber negotiates a program for members to receive preferential rates or identifies sufficient demand to encourage a carrier to enter into an underserved market.

Seminars and Workshop Events

Conduct technology fairs and workshops to educate the community on technology developments and opportunities. Involve the carriers and telecom companies as lecturers, presenters, and exhibitors. This allows both the consumer and the provider an opportunity to meet and discuss mutual opportunities.

County Wide Franchise Agreements

Negotiate County wide franchise agreements with the telecom and cable TV carriers instead of agreements negotiated at the city, town or village level. This will create more negotiating power for all involved as well as develop equality of service throughout the County. The first step in this process is gathering existing documentation on current franchise agreements. This process is most successful if directed at a County level. For communities who receive Franchise Fees or other forms of revenue from existing Agreements, these do not necessarily need to be re-negotiated.

6.2 Provide Incentives to Carriers

Through the use of grants, tax programs and franchise agreements, work with the carriers to provide access and competitive services throughout the County. Negotiate and develop a sense of partnership to encourage carriers to upgrade and expand infrastructure and services.

Continue developing partnerships with service providers for the build out of infrastructure

The grant application submitted by Mid-Hudson Cable if awarded should provide a good foundation to increase broadband availability in the central and western portions of the County where little or none currently exists. If the grant is unsuccessful then the County should continue to work with Mid-Hudson Cable on perusing other grant sources or perhaps member item funding opportunities.

The County should consider leveraging rights of way on County highways and properties for infrastructure development.

School districts and BOCES need to explore how they might partner with the telecom carriers to develop a more cost effective solution to interconnect schools for high bandwidth voice, video and data applications, such as distance learning.

Similar initiatives could be undertaken for determining the feasibility and costs of a regional telemedicine and healthcare network. In fact, the two initiatives healthcare and education may have synergies and cost sharing opportunities.

6.3 Community Network Infrastructure – Open Access Model

ECC considered the development options of a municipal based Open Access Model. At this point we believe such a program might be sustainable in the eastern portion of the county but would become a burden to the taxpayers if expanded to the central and western portions. If improvements are not seen via short term initiatives then this would be a consideration for longer term options. Approximately 120 miles costing approximately $4.8 million to build would be required. The annual Operations and Maintenance costs would be approximately $400,000. Additional assessment can be provided by ECC on this if desired.

Typically these recommendations have varying degrees of investment resources and phasing. The County should evaluate the recommendations for their economic impact realizing the county's overall goals for economic development and improved quality of life.

Recommendations should be evaluated to encourage public private partnerships, private telecommunication service provider investment in fiber, wireless infrastructures, and digital technologies that result in improved and competitively priced services. Longer term community network infrastructures should also be evaluated for opportunities to improve economic development and community access to competitively priced telecommunications services.

Each of the recommendations should be considered as potential solutions for meeting the county's short and long term goals and be evaluated for costs, economic impacts and benefits to the community. The healthcare industry is looking for advanced access solutions that are high bandwidth and competitive in costs. County IT would like control of its wide area network bandwidth needs.

Appendix A-1

County Central Office Services
&
Provider Information

Greene County Central Office Services

Services

The following tables describe the telecom services currently available within each of the LEC's central office exchanges. These services are supported by the switch technology at the central office locations and may or may not be available to a customer within the exchange dependent upon the cabling infrastructure available and/or the distance to the central office.

Please note: ICB is Individual Case Basis. If a service box is left blank the service provider declined to provide information.

Telephone I-LECs by Central Office location / Services

Company/Contact	CO	Exchange	Services Supported at CO	Bandwidth	Available 2009 (Yes/No)
Verizon Tel	Cairo	(518) 622-xxxx	Analog	9.6k-56k Dialup	Yes
ILEC			ISDN	64k-1.5mbs	Yes – basic
			Frame Relay	16k-1.5mbs PVCs	n/a
			DSL	128k – 1.5mbs	Yes
			T1/DS1	128k – 1.5mbs	n/a
			T3/DS3	1.5mb – 45mbs	n/a
			ATM (OC3)	1.5mb – 155mbs	n/a
			Gig-E	1000mbs	n/a
Verizon Tel	Catskill	(518) 943-xxxx	Analog	9.6k-56k Dialup	Yes
ILEC			ISDN	64k-1.5mbs	Yes – basic
			Frame Relay	16k-1.5mbs PVCs	n/a
			DSL	128k – 1.5mbs	n/a
			T1/DS1	128k – 1.5mbs	n/a
			T3/DS3	1.5mb – 45mbs	n/a
			ATM (OC3)	1.5mb – 155mbs	n/a
			Gig-E	1000mbs	n/a
Verizon Tel	Freehold	(518) 634-xxxx	Analog	9.6k-56k Dialup	Yes
ILEC			ISDN	64k-1.5mbs	No

			Frame Relay	16k-1.5mbs PVCs	n/a
			DSL	128k – 1.5mbs	Yes
			T1/DS1	128k – 1.5mbs	n/a
			T3/DS3	1.5mb – 45mbs	n/a
			ATM (OC3)	1.5mb – 155mbs	n/a
			Gig-E	1000mbs	n/a
Verizon Tel	Greenville	(518) 966-xxxx	Analog	9.6k-56k Dialup	Yes
ILEC			ISDN	64k-1.5mbs	No
			Frame Relay	16k-1.5mbs PVCs	n/a
			DSL	128k – 1.5mbs	Yes
			T1/DS1	128k – 1.5mbs	n/a
			T3/DS3	1.5mb – 45mbs	n/a
			ATM (OC3)	1.5mb – 155mbs	n/a
			Gig-E	1000mbs	n/a
Verizon Tel	Hunter	(518) 263-xxxx	Analog	9.6k-56k Dialup	Yes
ILEC			ISDN	64k-1.5mbs	No
			Frame Relay	16k-1.5mbs PVCs	n/a
			DSL	128k – 1.5mbs	Yes
			T1/DS1	128k – 1.5mbs	n/a
			T3/DS3	1.5mb – 45mbs	n/a
			ATM (OC3)	1.5mb – 155mbs	n/a
			Gig-E	1000mbs	n/a
Verizon Tel	Lexington	(518) 989-xxxx	Analog	9.6k-56k Dialup	Yes
ILEC			ISDN	64k-1.5mbs	Yes – basic
			Frame Relay	16k-1.5mbs PVCs	n/a
			DSL	128k – 1.5mbs	No
			T1/DS1	128k – 1.5mbs	n/a
			T3/DS3	1.5mb – 45mbs	n/a
			ATM (OC3)	1.5mb – 155mbs	n/a
			Gig-E	1000mbs	n/a
Verizon Tel	Oak Hill	(518) 239-xxxx	Analog	9.6k-56k Dialup	Yes
ILEC			ISDN	64k-1.5mbs	No
			Frame Relay	16k-1.5mbs PVCs	n/a
			DSL	128k – 1.5mbs	No
			T1/DS1	128k – 1.5mbs	n/a
			T3/DS3	1.5mb – 45mbs	n/a
			ATM (OC3)	1.5mb – 155mbs	n/a
			Gig-E	1000mbs	n/a
Verizon Tel	Windham	(518) 734-xxxx	Analog	9.6k-56k Dialup	Yes
ILEC			ISDN	64k-1.5mbs	Yes – basic
			Frame Relay	16k-1.5mbs PVCs	n/a
			DSL	128k – 1.5mbs	Yes
			T1/DS1	128k – 1.5mbs	n/a
			T3/DS3	1.5mb – 45mbs	n/a
			ATM (OC3)	1.5mb – 155mbs	n/a
			Gig-E	1000mbs	n/a
Verizon	Tannersville	(518) 589-xxxx	Analog	9.6k-56k Dialup	Yes
ILEC			ISDN	64k-1.5mbs	Yes – basic

			Frame Relay	16k-1.5mbs PVCs	n/a
			DSL	128k – 1.5mbs	Yes
			T1/DS1	128k – 1.5mbs	n/a
			T3/DS3	1.5mb – 45mbs	n/a
			ATM (OC3)	1.5mb – 155mbs	n/a
			Gig-E	1000mbs	n/a
Verizon	Palenville	(518) 678-xxxx	Analog	9.6k-56k Dialup	Yes
ILEC			ISDN	64k-1.5mbs	Yes – basic
			Frame Relay	16k-1.5mbs PVCs	n/a
			DSL	128k – 1.5mbs	DSL
			T1/DS1	128k – 1.5mbs	n/a
			T3/DS3	1.5mb – 45mbs	n/a
			ATM (OC3)	1.5mb – 155mbs	n/a
			Gig-E	1000mbs	n/a
Verizon	Prattsville	(518) 299-xxxx	Analog	9.6k-56k Dialup	Yes
ILEC			ISDN	64k-1.5mbs	No
			Frame Relay	16k-1.5mbs PVCs	n/a
			DSL	128k – 1.5mbs	No
			T1/DS1	128k – 1.5mbs	n/a
			T3/DS3	1.5mb – 45mbs	n/a
			ATM (OC3)	1.5mb – 155mbs	n/a
			Gig-E	1000mbs	n/a
State Telephone	Coxsackie	(518) 731-xxxx	Analog	9.6k-56k Dialup	Yes
ILEC			ISDN	64k-1.5mbs	n/a
			Frame Relay	16k-1.5mbs PVCs	Yes
			DSL	128k – 1.5mbs	Yes
			T1/DS1	128k – 1.5mbs	Yes
			T3/DS3	1.5mb – 45mbs	Yes
			ATM (OC3)	1.5mb – 155mbs	Yes
			Gig-E	1000mbs	No

Greene County Service Providers

A) Wire-line Service System				
Company Name	**Address**	**City**	**State**	**Telephone Number**
Verizon				888-625-8111
State Telephone	46 Reed St.	Coxsackie	NY	(518) 731-6128
B) Long Distance Service				
Company Name	**Address**	**City**	**State**	**Telephone Number**
AT&T				800-225-5288
State Telephone Company	46 Reed St.	Coxsackie	NY	(518) 731-6128
Quest				800-860-8080
Sprint				800-877-4500
MCI				800-444-4444
Excel				800-875-9235
C) Cable Provider				
Company Name	**Address**	**City**	**State**	**Telephone Number**
Time Warner Cable	130 Washington Avenue Ext.	Albany	NY	866-321-2225
Mid-Hudson Cable	200 Jefferson Hts.	Catskill	NY	(518) 943-6600
D) ISP – Internet Service Provider				
Company Name	**Address**	**City**	**State**	**Telephone Number**
Time Warner Telecom	10 Airline Dr.	Albany	NY	(518) 640-0900
E) Wireless Service Provider				
Company Name	**Address**	**City**	**State**	**Telephone Number**
NYAir	207 Jefferson Hts.	Catskill	NY	(518)-966-4747

F) Satellite Providers				
Company Name	**Address**	**City**	**State**	**Telephone Number**
Hughes Network Systems				1-800-428-9570
Wild Blue Communications				1-866-974-7174