



9. Telecommunications Assessment

Introduction

Telecommunication is defined as communication at a distance.¹ These types of communication include telephone, cable television and a variety of types of Internet service. Not only are these services vital to communication patterns, but also are key to a region's quality of life by fostering connectivity. Furthermore, the retention, expansion and attraction of businesses and high-tech producer services firms are dependent on infrastructure for data processing, distribution, and transmission. In rural areas, there is often a need to aggregate demand to achieve sufficient economies of scale.

The corridor between Albany and New York City, known as "Tech Valley," is faced with the opportunity and challenge of competing as a premium location for technology-based businesses. While Greene County has the strategic advantage of being located south of the Capital District and north of New York City, telecommunications infrastructure will need to be enhanced for the next waves of technological growth and change. In order to close this gap in Greene County, an analysis was conducted to determine the availability of telecommunications. The results will help establish opportunities for further development and expansion of telecommunications capability in Greene County.

Currently, pressing telecommunications needs are not being met in parts of the County. Providers do not serve several municipalities, and even some communities that are served have sporadic and unreliable service. Improvements in the telecommunications system in Greene County would promote economic growth by fostering an increased base of business-to-business sales, as well as that of business-to-consumer sales. Residents, businesses, educational institutions, health care providers, and municipal and County governments would also greatly benefit from enhanced telecommunications availability.

KEY FINDINGS

- Greene County is serviced by two telephone providers, two cable television and high-speed Internet providers, and two wireless Internet providers.
- Telecommunications services include dial-up, ISDN, DSL, T-1, T-3, ATM OC1 and OC3 Internet, cable television and high-speed Internet, and wireless Internet.
- The telecommunications infrastructure that is in place in Greene County is very intermittent, due to the providers' desire to locate only in populous areas with a large client-base. As a result,

¹ Merriam Webster Online Dictionary, <http://www.m-w.com/dictionary/>



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some of the rural and less populated municipalities lack access to adequate telecommunications.

- The Statewide Wireless Network and the National LambdaRail initiatives would allow for the less populated municipalities in Greene County to be serviced by telecommunications where they otherwise were not able. These initiatives also help reduce start-up costs for telecommunications providers by allowing them to piggyback on publicly funded infrastructure. The County also has the added benefit of having the ability to direct the location of such infrastructure in a way that would reduce adverse visual and environmental impacts.
- It is necessary to construct a fiber backbone, enhanced countywide wireless, and a fiber-ring around businesses located in the County's business parks for Greene County to fully participate in "Tech Valley" and attract and retain the types of business and industries that will grow its economy. Having enhanced connectivity would also help to attract the technology-savvy creative workforce.
- Plans for expansion of telecommunications services in Greene County should be tied with the County's plans to develop medium scale business and industrial sites along the Route 23 and Route 145 corridors in the Valley Towns, as well as future sites for small-scale development in the Mountaintop Towns.
- Several types of funds are available and necessary to fill the gaps in the telecommunications infrastructure in Greene County. These include USDA Rural Broadband Access Loan Program, Empire State grants, and CDBG funding, as well as the Greene County Quantum Fund.
- Next step strategies include conducting a more intensive telecommunications assessment and detailed action plan that will gauge a more specific demand from local businesses and residents of Greene County, partnering with current providers to fill the connectivity gaps in place, capitalizing on cooperation with existing infrastructure, and ultimately fostering economic growth by constructing the necessary infrastructure to attract and retain technology-related businesses to Greene County.



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Inventory of Existing Telecommunications Infrastructure in Greene County

A study of the telecommunications in Greene County illustrates that the County is very segmented and diverse with existing telecommunications providers, such as: Verizon, State Telephone Company, Mid-Hudson Cablevision, Hudson Valley DataNet, Surferznet/NY Air, and new to the market, American Wi-Fi, all offering or planning connectivity that could be sporadic and unaffordable to a large share of the population.

EXISTING SERVICE AREAS AND LEVELS OF SERVICE

The inventory of telecommunications in Greene County has focused on two components: the infrastructure on which telecommunications services are provided (fiberoptic cable, copper wire, coaxial cable, etc.), and the services provided by local exchange carriers, telecommunications companies and other firms.

There are numerous types of Internet infrastructure. Each has a different bandwidth, or amount of data that can be transmitted in a fixed amount of time. The bandwidth is expressed in bits per second (bps), with a higher bps indicating faster speed. Ranked from fastest to slowest, the most prevalent include:²

Fastest	
Standard uses: Live broadcasts, streaming multimedia, huge data transfers, videoconferencing, huge volume	
Wireless Local Area Network (WLAN)	This type of connection uses high frequency radio waves rather than wires to transmit data. A wireless card is necessary to attach to a computer, which allows the user to tap into the WLAN. WLANs are very flexible, and can be installed where wires cannot, allowing even the most remote of users to connect to the network.
Asynchronous Transfer Mode (ATM)	This transfers data in cells or packets of a fixed size which allows for ATM equipment to transmit multiple types of data over the same network and assumes that no single type of data dominates the line. Currently, this serves as one of the fastest levels of service available.
Optical Carrier 1 (OC1)	This mode supports data transfer at a rate of 51,850,000 bps.
Optical Carrier 3 (OC3)	An improved version of OC1, this mode supports data transfer at a rate of 155,520,000 bps.

² Definitions from Webopedia, <http://www.webopedia.com> and Search Security, <http://searchsecurity.techtarget.com/>.



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Fast	
Standard uses: Multimedia, large file or data transfers, high volume	
T-carrier 3 (T-3)	An improved version of T-1, this uses a digital phone connection that supports data rates at around 43,000,000 bps with 672 individual channels of 64,000 bps.
Digital Subscriber Line (DSL) – varies	This uses copper telephone lines, and depending on the proximity to a telephone company’s central office, bandwidths could be as high as 6,100,000 bps, with an average connection of 1,544,000 bps.
Average	
Standard uses: High-speed Internet, multimedia, medium volume	
T-carrier 1 (T-1)	This form consists of a digital phone connection, originally comprised of a pair of twisted pair copper wires forming 24 individual channels each supporting 64,000 bps, with a total bandwidth of around 1,544,000 bps. Now, coaxial cable, optical fiber, digital microwave, and other types of media can be used.
Digital Subscriber Line (DSL) – varies	See above. Bandwidths could be as high as 6,100,000 bps, with an average connection of 1,544,000 bps.
Cable	This mode allows a computer to be hooked up to a coaxial cable television line, allowing faster bandwidths of around 1,500,000 bps.
Slower	
Standard uses: Web browsing, file sharing, low volume	
Integrated Services Digital Network (ISDN)	This uses digital telephone lines or normal copper telephone wires via an ISDN adapter to transmit at speeds around 112,000 bps.
Digital Subscriber Line (DSL) – varies	See above. Bandwidths could be as high as 6,100,000 bps, with an average connection of 1,544,000 bps.
Slowest	
Standard uses: File transfer, Telnet, e-mail	
Dial-up	This mode makes a connection to a local telephone number that is shared by many users, resulting in a lower bandwidth of around 28,000 bps to 56,000 bps.

Six telecommunications providers were surveyed regarding types of infrastructure that their firms offer to municipalities in Greene County (see chart below). Verizon and State Telephone Company offer the greatest selection to Greene County; both offer Dial-up, T-1, DSL, T-3, and ATM. Hudson Valley Data Net provides T-1 and T-3 as well as Gigabit Ethernet and ATM, whereas Mid-Hudson Cable only offers T-1, DSL and Cable Internet. SurferzNet/NY Air is the newest provider in the region, with SurferzNet offering Dial-up and Satellite Internet, and NY Air offering Wireless Internet. American Wi-Fi is planning on expanding into Greene County, and is planning to offer Catskill and eventually the entire County wireless Internet access.

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	Verizon	State Telephone Company	Mid-Hudson Cable	Hudson Valley Data Net	SurferzNet/ NY Air	American Wi-Fi ³
Dial-up, 56k						
ISDN, T-1						
T-1, DSL, Cable				T-1 Only		
T-3, DSL				T-3 Only		
ATM OC1, OC3						
Gigabit Ethernet						
Satellite Internet						
Wireless Internet						

A distinct pattern is evident when one considers the service provided to each of the three subregions. Each of the three Valley Towns has between two and four different service providers. The Historic River Towns are also well-served by telecommunications companies. With the exception of the Jefferson Heights, Leeds and Palenville areas, each of the River Towns is serviced by at least three different providers. A fiber backbone also runs along the NYS Thruway and the Conrail line, making telecommunications available to industrial parks and businesses in the Historic River Towns on an as-needed basis. This network delivers enhanced fiberoptic capabilities extending south from Albany to Manhattan, continuing west from Albany to the western edge of the New York State line, ultimately terminating in Cleveland, Ohio.⁴

The Mountaintop Towns are the most underserved, with the majority of the towns being offered only one or two choices of telecommunications providers. The Village of Tannersville is not served at all. Providers are hesitant to extend their lines without a critical mass of customers that are able to access their networks. This is most likely due to their small populace and extremely rural setting, which would make for a difficult and expensive undertaking for telephone and cable companies.

Satellite Internet may be an option for these and other small towns that may not have the available infrastructure in place. However, it is not guaranteed that any given locale can pick up a signal, and this option is quite costly. There is a one-time start up cost of nearly \$470, which includes the cost of a satellite dish, modem, installation, and activation in addition to the monthly premium paid for the high-speed satellite service.

³ American Wi-Fi can offer ISDN, T-1, DSL, Cable, or ATM OC1/OC3 Internet, but the service would be through a provider such as Mid-Hudson Cable or Hudson Valley Data Net.

⁴ "MFS Network Technologies Finalizes Sale of Duct Capacity along New York State 'Infothruway'," April 16, 1999, <http://www.williams.com/newsmedia/newsreleases/rel335.html>, accessed Sept. 27, 2006.

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Existing Telecommunications Infrastructure in Greene County						
	Verizon	State Telephone Company	Mid-Hudson Cable	Hudson Valley Data Net	SurferzNet/ NY Air	American Wi-Fi
Historic River Towns						
Athens	■		■		■	
Catskill*	■		■	■	■	■
Coxsackie	■		■			
New Baltimore	■		■			
Valley Towns						
Cairo	■		■		■	
Durham	■				■	
Greenville	■	■	■		■	
Mountaintop Towns						
Ashland	■		■			
Halcott	■					
Hunter**					■	
Jewett	■					
Lexington	■					
Prattsville	■		■			
Windham	■		■			

Source: Provider interviews, 2005-2006. Note that satellite Internet may be available in parts of each municipality in Greene County.

* Excludes the hamlets of Jefferson Heights, Leeds and Palenville.

** Excludes the Village of Tannersville.

EXISTING CENTRAL OFFICE LOCATIONS AND DSL AVAILABILITY

As shown on Map 17 in the Appendix, Digital Subscriber Line (DSL) service is available to approximately half of Greene County. DSL providers include Verizon and State Telephone Company. Verizon has indicated that they offer DSL to parts of many municipalities, depending on the proximity from a user to one of the County's central offices. DSL is available within 18,000 feet (3.41 miles) of each central office. Verizon offers DSL out of 7 of the 11 central offices that are located in Greene County.

State Telephone Company also offers DSL service to several areas in Greene County. According to State Telephone, the telecommunications provider serves Coxsackie and New Baltimore. State Telephone can provide DSL to about 97% of these service areas because of small remote offices spread throughout the region. Accessibility is offered up to a distance of 23,000 feet (4.36 miles) from the central and remote offices. State Telephone is also present in a small portion of both Greenville and Athens.



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EXISTING CABLE TV AND HIGH-SPEED INTERNET SERVICE

As shown on *Map 18*, Time Warner and Mid-Hudson Cablevision are the only two providers that offer cable television and high-speed Internet services to Greene County. Time Warner is the only cable provider situated in the southeast of Greene County, providing services to Halcott, Jewett and Hunter. Mid-Hudson Cablevision is the largest provider of cable service in Greene County, serving almost all of Prattsville, Ashland, Greenville, Cairo, Coxsackie and Athens. Time Warner and Mid-Hudson Cable both provide cable service to the populous municipalities of New Baltimore, Windham and Catskill. According to interviews with the two service providers, Time Warner and Mid-Hudson Cablevision do not service Lexington or the majority of Durham (with the exception of Oak Hill).

RECENT DEVELOPMENTS IN TELECOMMUNICATIONS IN GREENE COUNTY

When competing for technology-related businesses, new telecommunications infrastructure and specifically wireless Internet, will help substantially in attracting companies to Greene County. There are several recent developments in the County geared toward improving telecommunications.

American Wi-Fi has begun discussions with the Village and Town of Catskill proposing to install their wireless base in Catskill, which can expand to virtually anywhere once access points are set up. According to Andrew Halpern, President and Owner of American Wi-Fi, once the Catskill base is set up, there will be a range of connectivity up to 20 miles from the access points. After the access points in Catskill are in place, connections can be made practically anywhere. Even less populated areas that are currently underserved can tap into this network, but an additional charge would apply. The new technology – mesh network – only needs a mere line of sight to at least one access point. As long as at least one access point can get signals from another, then the expansion will continue.

State Telephone Company has brought wireless Internet technology to portions of Greene County.⁵ The plan's focus is to first install wireless technology at the Greene Business and Commerce Park and Kalkberg Commerce Park, and then to install services along the riverfront sections of New Baltimore and Coxsackie. The installation of this infrastructure allows users to connect to the Internet without phone, DSL or cable wires. However, users must have a wireless card attached to their computers to enter into the network that is in place. The Greene County Industrial Development Agency hopes that this new wireless service will spark business park development and attract technology-related businesses that expect these types of services.

⁵ Antonio D'Arcangelis, "State Tel installing wireless network in biz parks," Hudson Valley Newspapers, October 11, 2005.



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Mid-Hudson Cablevision, Inc. has received grants from both the Empire State Development Corporation and the U.S. Department of Agriculture's Rural Broadband Access Loan Program. Mid-Hudson plans to use these funds to install over 200 miles of fiberoptic cable and introduce wireless services in rural areas of the County, including Greenville, Ashland, Prattsville and Durham in Greene County.

Hudson Valley DataNet is the newest telecommunication provider to Greene County. The company has added new high-speed fiberoptic lines through Catskill to Hudson, and plans on focusing on commercial and institutional clients.

Local service provider *SurferzNet* has teamed up with *NY Air* to construct an 80-foot tower in the Town of Durham providing additional wireless service areas in the western portion of the County. *NY Air* already serves Greenville, Cairo, and parts of other communities in Greene County, and with the addition of this tower, wireless Internet access will be made available to 75-90% of Durham as well. Currently, costly satellite service is the only high-speed infrastructure available in underserved areas. The new wireless service will be able to reach almost any user in the area that faces the mountainside⁶. *NY Air* was recently awarded an \$87,138 Quantum Fund loan from Greene County to help expand wireless Internet coverage in portions of Greene County that are underserved. The loan will be used to invest in and install new equipment, towers, and antennas that will help fill the gaps in their existing coverage areas. *NY Air* plans to install eight towers that will allow for the expansion into Durham, Catskill, Coxsackie, Hunter and Windham.⁷

EMERGING TRENDS IN ENHANCED RECEPTIVITY OVER GREATER DISTANCES

For most wireless services to succeed, a direct line of sight from the transmitter to the antenna is needed. However, in mountainous or wooded areas, such as many subsets of Greene County, access to these services can be difficult, and expensive. A mesh network may be an answer to these problems. This network only needs a mere line of sight to at least one access point. As long as one access point can get signals from another, then the expansion will continue. Mesh network works with a tri-band, meaning that there is a 5.8 frequency that is used as a backbone. Another band of 2.4 frequency works as a Wi-Fi extension, and another radio at 4.9 frequency is in place to make sure that the lines do not cross. If one goes down, the other two will back them up; a sort of self-healing process to ensure constant service is available. Homeland Security adopted this mesh network technology for residential use and works with GPS technology for the best use. There are several

⁶ Sean Springer, "Web surfing about to get easier in Durham, Rensselaerville," The Greenville Press, April 27, 2006.

⁷ Greene County, "NY Air Awarded \$87,000 Loan from Greene County To Expand Broadband Wireless Internet Coverage in County," June 28, 2006. http://www.greeneeconomicdevelopment.com/press1_000.swf



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mesh networks being used on the West Coast, but the East Coast has been slow to take advantage of such a technology break-through.

Patterns of Telecommunications Services

CURRENT USAGE AND ACTIVITIES

All existing industrial parks in Greene County have access to telecommunications on site. Currently, State Telephone services the Greene Business and Technology Park and the Kalkberg Commerce Park with both fiber and DSL lines. The Hudson Valley Business Park has access to T-1, DA-3 and DSL lines. Fiber backbone runs along the NYS Thruway and the Conrail line, making T-1 lines available to the future Athens Industrial Park and the future Catskill Industrial Park on an as-needed basis.

EXISTING REGIONWIDE & STATEWIDE INITIATIVES

Statewide Wireless Network (SWN)

Many areas of Greene County are rural and sparsely populated, which is a deterrent for telephone and cable companies to invest in their infrastructure. Many of these communities do not have access to an emergency response system, including 911 capabilities, nor to cellular telephone service, or broadband Internet. In order to provide such vital services, New York State has initiated the Statewide Wireless Network (SWN). The SWN will consist of a \$2 billion wireless network to improve communications for emergency responders throughout the state. This construction aims to improve emergency response times for both state and local agencies, by filling a majority of the gaps that are in place within the emergency communications network. Completion of this system is expected to occur in 2010, and in that time, 95% of the state will have access to this crucial network.⁸ The SWN plans to:

- Facilitate the completion of the full Statewide Wireless Network implementation in the shortest period of time.
- Emphasize the use, refurbishment or replacement of existing tower infrastructure.
- Minimize the need for new, standard tower construction.
- Minimize overall site acquisition timeframes for the state.

⁸ McGraw Hill Construction, "New York to Construct \$2 Billion Wireless Network," New York Construction News, December 2005. <http://newyork.construction.com/news/infrastructure/archive/2005/12.asp>

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- Minimize overall site acquisition costs for the state.
- Minimize the visual impact of towers on the environment.⁹

Local governments and public authorities could join forces and participate together in the SWN initiative. Although participation in the initiative is voluntary, there are several outstanding ways that it can be done, which will lead to a more efficient and cost-effective State Wireless Network. One way would be to share the communications infrastructure, thus reducing construction and maintenance costs and the overall environmental impact. Furthermore, community character would less likely be visually impacted with fewer towers throughout the State. Connection partnerships could also be formed that will tie the SWN in with existing local government radio systems, thereby enabling local Public Safety Answering Points (PSAP) to operate with statewide PSAPs. In turn, this leads to an overall increased efficiency with each partner maintaining full control of the communication systems and networks. Lastly, full SWN system participation is necessary in order to achieve 95% geographic coverage and 97% roadway coverage. It would be advantageous for local PSAPs to utilize the SWN infrastructure. This includes the sharing of frequencies, towers, training, and other equipment to reduce local costs and to improve the communications network in its entirety.¹⁰

Perhaps one of the most interesting facets of the SWN is the interconnectedness that is possible between local governments. Data and file sharing can be done over computers or mobile devices. This data sharing could be utilized for ordinary messaging or for more important uses such as disaster preparedness or homeland security.

In addition to these benefits, a SWN network will also offer high-tech features to each participating municipality. These include:

- **Dynamic regrouping** – Combines various work systems as one operational unit for specific purposes. For example, public works, utilities and law enforcement are all needed when doing road construction.
- **Emergency notification** – The highest priority message is repeatedly sent in case of a severe emergency.
- **Automatic number identification** – Reveals users name or identification number.

⁹ New York State Office of Technology, *Statewide Wireless Network*, May 10, 2006, <http://www.oft.state.ny.us/swndocs/bbs/detail2.cfm?which2=358&which=SWNProject%20General%20Information>

¹⁰ New York State Office of Technology, *Statewide Wireless Network*, May 10, 2006, <http://www.oft.state.ny.us/swndocs/bbs/detail2.cfm?which2=363&which=SWNProject%General%Information>

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- **Group call** – Sends a message simultaneously to each user on a given list at the press of a button.
- **System roaming** – Allows tracking and exact location of user.
- **Secure communications** – Allows for encrypted units for top secret information transfer.
- **Automatic vehicle location**

Greene County participation in the SWN initiative would allow less populated municipalities to have access to emergency services. Local government offices would also benefit from this initiative through enhanced connectivity. Start-up costs for telecommunication providers would be less costly by piggybacking on publicly-funded infrastructure, thereby increasing connectivity in smaller communities. Another benefit to the County would be the ability to direct the location of such infrastructure in a way that would reduce adverse visual and environmental impacts.

National LambdaRail (NLR)

National LambdaRail is a major initiative of U.S. research universities and private sector technology companies to provide a national scale of infrastructure for research and experimentation in networking technologies and applications. National LambdaRail maintains a unique nationwide network infrastructure that is owned and controlled by the U.S. research community. Ownership of the underlying optical infrastructure ensures the research community unprecedented control and flexibility in meeting the requirements of the most advanced network applications and providing the resources demanded by cutting-edge network research. NLR aims to:

- Support experimental and production networks.
- Foster networking research.
- Promote next-generation applications.
- Facilitate interconnectivity among high-performance research and education networks.

The defining characteristic of the NLR infrastructure is its ability to support many distinct networks for the U.S. research community using the same core infrastructure. Experimental and production networks exist side-by-side but are physically and operationally separate. Production networks support cutting-edge applications by providing users guaranteed levels of reliability, availability,



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and performance. At the same time, experimental networks enable the deployment and testing of new networking technologies, providing researchers national-scale test beds without the limitations typically associated with production networks.

A variety of networks are bundled over the NLR infrastructure, providing researchers convenient and broad-based access to multiple networks, as well as access to real-world production network data. This same feature facilitates the migration of promising technologies into production, and permits research and development to transcend individual networking technologies.

The NLR optical system is deployed nationwide across roughly 15,000 route-miles of dark fiber that NLR has obtained through Level 3 Communications and WilTel Communications. Four NLR wavelengths have been implemented using 10 Gigabit Ethernet LAN PhY (physical layer), a technology and architecture that had previously been limited to metro-area networks.

NLR would allow businesses located in the County's industrial parks as well as Stiefel Laboratories in Oak Hill and Columbia-Greene Community College to benefit from these services. Other regional business parks and universities in surrounding counties could also take advantage of this initiative. Major players include the University at Albany, Rensselaer Polytechnic Institute, Harriman Research and Technology Park and Albany Nanotech.

TELECOMMUNICATION NEEDS OVER THE NEXT 5 YEARS

Adequate telecommunications service is necessary for Greene County to be competitive in the Tech Valley community. For Greene County to fully participate in Tech Valley as well as attract and retain the types of technology-related businesses and industries that will grow its economy, it is essential to have the most current and best telecommunications infrastructure in place for residents, local governments, and businesses alike. Companies will need these technologies for company efficiency, and expansion of their firms. Within the next five years, every effort should be made to have the entire County accessible to telecommunications.

An improved access to telecommunications infrastructure through a fiber ring and a fiber backbone will substantially enhance the County's ability to support economic development. A fiber backbone would consist of the installation of fiberoptic cable throughout areas of Greene County where allowable by natural terrain and environmental features. Such a backbone would allow all communities within the County to have access to this infrastructure, by placing the fibers in areas where it does not currently exist. The development of a fiber-ring should be centered on businesses located in technology/industrial/commercial parks. This would serve the current businesses located in the parks and serve as a great incentive that would allow for continued business expansion and training opportunities. Furthermore, it is necessary to provide an enhanced wireless system at the



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County-level. Greene County should seek out private partners that can build and operate wireless networks in underserved areas of the County. It is important to note that in more sparsely populated rural areas, the market could not support the presence of two or more competing wireless providers. Currently, telecommunications providers take this into consideration when making plans for service expansion, but it is largely dependent upon the provider businesses to work cooperatively in a very competitive business climate.

While existing fiber networks are concentrated in the Historic River Towns around the business parks, future expansion of telecommunication services should be tied with Greene County's plans to develop medium-scale business parks along the Route 23 and Route 145 corridors in the Valley Towns. Telecommunications is an important component for any industrial site to become shovel-ready. Fiber rings and telecommunication services should also be made available in areas identified as potential sites for small-scale development in the Mountaintop Towns.

INDUSTRY SPECIFIC TELECOMMUNICATIONS REQUIREMENTS

It is necessary to understand telecommunications requirements at two levels. Large businesses and technology-related companies are most likely to be centered in industrial parks and will demand connectivity that allows them to transfer data, and share files. This is most likely to be accommodated by T-1 or T-3 infrastructure. Smaller businesses would require more affordable T-1, DSL, or wireless service in order to connect to e-commerce and other smaller-scale operations.



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Funding for Telecommunications Expansion

Several funding sources are available that Greene County and telecommunications providers could tap to help fill the gaps in telecommunications service. Funds provided at the federal, state, and county level will help Greene County attract and retain a tech-savvy population and technology-related businesses that are in need of an enhanced countywide telecommunications infrastructure system.

United States Department of Agriculture (USDA) Rural Broadband Access Loan Program – The USDA's Rural Broadband Access Loan Program was established to make broadband Internet services available throughout the nation by 2007. The \$1.15 billion program's objective is to bring broadband Internet access to municipalities of 20,000 or fewer that are currently underserved or not served. The program provides loans and loan guarantees for the construction, improvement, and acquisition of facilities and equipment for broadband service in eligible rural communities. Priority is given to projects that are proposing to serve areas where no residential broadband service currently exists.

United States Department of Agriculture (USDA) Rural Development Community Connectivity Broadband Grant Program – The USDA's Community-Oriented Connectivity Broadband Grant Program is designed to provide financial assistance in the form of grants to eligible applicants that will provide currently un-served areas, on a "community-oriented connectivity" basis, with broadband transmission service that fosters economic growth and delivers enhanced education, health care, and public safety services. \$8.9 million was budgeted for 2006, with a minimum loan amount of \$50,000. The program is designed to stimulate practical, everyday uses and applications of broadband facilities by cultivating the deployment of new broadband transmission services that improve economic development and provide enhanced educational and health care opportunities in rural areas.

Empire State Development Corporation Wired Buildings Grant Program – Wired Buildings is a grant program developed by Empire State Development Corporation (ESDC) to encourage the rehabilitation and "wiring" of existing, non-Class A commercial buildings and business incubators throughout regions of New York State. The goal of the program is to provide affordable rental rates for such "wired" space to smaller, Information Technology-based (IT) companies. The "wiring" refers to establishing of high-speed broadband connections to selected buildings from telecommunications service providers' points-of-presence (POPs), and the distribution of the wiring throughout the building.

To be eligible for grants of up to \$75,000, a proposed project must:



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- Promote the economic health of New York State by facilitating the creation or retention of jobs or would increase business activity within a municipality or region of the state.
- Offer broadband connectivity that would be unlikely to take place in the near term without the requested assistance.
- Be reasonably likely to accomplish its stated objectives and that the likely benefits of the project exceed costs.

Public Telecommunications Facilities Program (PTFP) – The Office of Telecommunications and Information Applications (OTIA), under the National Telecommunications and Information Administration, administers the Public Telecommunications Facilities Program (PTFP). The PTFP assists state and local governments, educational and health care entities, libraries, public service agencies, and other groups in effectively using telecommunications and information technologies to better provide public services and advance other national goals. PTFP matches grants to public broadcast stations, nonprofit organizations, and state and local governments to construct:

- Public (noncommercial) radio and television stations.
- Distance learning telecommunications facilities using nonbroadcast technologies, such as microwave, fiberoptic cable, satellite distribution, and Instructional Television Fixed Internet Service (ITFS).
- Public telecommunications services and facilities available to, operated by and controlled by minorities and women.
- Projects which strengthen the capability of existing public TV and radio stations to serve the public.

Community Development Block Grant (CDBG) Program – Greene County applied for CDBG funds that were intended for a Telecommunications Digital Ring Study. While funding for the study did not materialize, CDBG Technical Assistance funding would be useful in conducting a more detailed investigation on how Greene County could enhance its telecommunications infrastructure. The CDBG Technical Assistance Program is designed to improve the skills, knowledge, management, and administrative practices of CDBG grantees as they relate to the CDBG program. It funds technical assistance services and products, such as publications, training materials, peer learning, seminars, workshops, and training sessions that enhance the ability of CDBG recipients to meet national and local CDBG program objectives. The funding is offered by the Governor's Office for Small Cities to local governments through a competitive application process.



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U.S. Department of Commerce, Public Works and Economic Development Program – This program is administered by the Economic Development Administration under the U.S. Department of Commerce. Public Works and Economic Development investments help support the construction or rehabilitation of essential public infrastructure and facilities necessary to generate or retain private sector jobs and investments, attract private sector capital, and promote regional competitiveness, including investments that expand and upgrade infrastructure to attract new industry, support technology-led development, redevelop brownfield sites and provide eco-industrial development.

Quantum Fund – The Greene County Department of Planning and Economic Development offers Quantum Fund loans for start-up and existing businesses operating in Greene County. Loans are made to local businesses to leverage private investment and to create new jobs, and to increase sales and property tax revenues. Quantum Fund loans range from \$20,000 to \$400,000. NY Air has recently availed itself of these loans to help expand wireless Internet coverage in the portions of the County that are underserved.



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Telecommunications Next Step Strategies

An evaluation of the existing infrastructure in Greene County indicates that securing adequate telecommunications infrastructure is essential to the County's future growth. To meet this objective, it is recommended that a strategy be formed that focuses County resources on telecommunications, while building public/private partnerships to ensure that the County, its employers and institutions can have access to the telecommunications technology that they need to succeed in the future.

Conduct a More Comprehensive Telecommunications Demand Study – Greene County should continue to seek funding through the CDBG Technical Assistance Program to conduct a more intensive telecommunications study. This application could build on the findings of the Greene County Comprehensive Economic Development Plan as a focus for the application. Alternately, the County could seek funds from other sources to address telecommunications infrastructure needs. The first step in preparing such a study would be gathering information from businesses, residents, and local governments regarding their telecommunications needs. This is necessary in order to correctly estimate the demand for telecommunications infrastructure and services necessary in Greene County.

Review and Revise County Policies on Private Use of Public Rights-of-Way – Transmission lines can often run under or along concrete highways and roads of cities and towns. Prior to competition in the telecommunications industry, managing public rights-of-way (ROWs) was a simple task of coordinating construction/expansion schedules between the department of public works and the regulated utilities. However, with the rise of the telecommunications industry and its corresponding expansion of infrastructure, each local jurisdiction within Greene County should treat ROW management as a high priority task. Not only will this serve allow local governments to better serve the needs of their communities for telecommunications infrastructure, but careful management of ROWs will also lower the build and maintenance costs of the infrastructure in Greene County. Furthermore, Greene County should develop a clear policy concerning ROW use so that it can be in the position to negotiate with telecommunication providers about infrastructure that can be provided to parts of the County that are both attractive to future business as well as infrastructure that can be provided to rural and non-accessible communities.

Expand Fiberoptic and Wireless Infrastructure – The demand for greater bandwidth is evident among businesses and residents in Greene County. The expansion of fiberoptics and wireless infrastructure will be able to provide the County's residents and businesses with the tools needed to succeed in the marketplace. It is recommended that Greene County would operate as a broker and a catalyst to stimulate investment that, left to its own devices, would likely occur some time in the future, given the infrastructure development and economic growth of the areas in question. However, it is well known that there are parts of Greene County where current economic activity and a small population make them very unlikely candidates to attract investment in broadband infrastructure. The



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use of wireless infrastructure would allow less populated areas such as the Mountaintop Towns to have telecommunications access without costly underground cables. As the County is increasingly participating in the Tech Valley economy, Greene County could enhance its competitive advantage by helping provide the needed infrastructure or facilitating the means for telecommunications providers to provide services. Greene County could continue to take steps in bringing the County to cutting-edge technology by assembling partnerships with telecommunications providers and the State of New York to expand telecommunications infrastructure.

Participate in the Statewide Wireless Network and National LambdaRail Initiatives – Greene County should consider participating in the Statewide Wireless Network (SWN). By participating in the SWN, not only will Greene County benefit from enhanced emergency receptivity, it will also have lower start-up costs for telecommunications providers by allowing them to piggyback on publicly funded infrastructure. This can be used as a major incentive for any business wishing to locate in Greene County. The County also has the added benefit of having the ability to direct the location of such infrastructure in a way that would reduce adverse visual and environmental impacts.

Participation in the National LambdaRail initiative would also be of substantial benefit to Greene County. The existing and forthcoming business parks as well as Columbia-Greene Community College would be able to tap into the national scale of infrastructure, research and experimentation that NLR provides. This provides a great opportunity for CGCC to have access to the latest technologies and research available across the nation. If the issue arises that the dark-fiber that NLR has already obtained does not reach Greene County, additional wavelengths can be activated across individual segments of the infrastructure as needed to accommodate future expansion.

Create a Cooperative Between Local Institutions and County Government to Gain Leverage – As part of its efforts to develop a countywide telecommunications infrastructure, Greene County should create a purchasing cooperative among large users of telecommunications services. These users would include local governments, school districts, health care institutions, the tourism industry, and businesses located in the industrial parks. This cooperative would establish various mechanisms to pool the purchase of certain telecommunications equipment and services. This could reduce costs to each individual user. More importantly, some communities have found that if they can aggregate demand, they are better able to encourage competition among the providers for such larger companies. In turn, this gives the large-scale users greater leverage with the providers. By acting as the key player in this effort, Greene County can assume a higher visibility role with telecommunications providers. This may assist in the efforts to fill the gaps and secure services for the rural and less populated areas of Greene County.