

Economic Development Is The Killer App For Local Fiber Networks

More and more communities are taking proactive steps to ensure that their communities are equipped with next-generation internet infrastructure. Their economic livelihood depends on it.

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*In the November-December 2014 edition of **BROADBAND COMMUNITIES**, the authors reviewed the available economic research and other evidence on the relationship between broadband and economic development and concluded that economic development was the “killer app” for local fiber networks. In this article, we update the research and other evidence to reflect new developments in the last two years, and we arrive at the same conclusion.*

For almost two decades, nearly every U.S. community that has developed a fiber optic broadband network has put economic development at the top of its list of reasons for doing so. To be sure, communities also recognize that fiber networks provide critical benefits for education, public safety, health care, transportation, energy, environmental protection, urban revitalization, government service and much more. Ultimately, however, the promise of economic development, including both attraction and retention of opportunities for meaningful and well-paying work, combined with the fear of falling behind other communities in the United States and around the world, unites local communities across political, economic, cultural, educational and other divides.

In short, just as communities a century ago found electrification essential to their survival and quality of life, communities today have increasingly come to recognize that their citizens can survive and thrive in the modern economy only if they have affordable access to high-capacity internet connections.

THE LINK BETWEEN BROADBAND AND ECONOMIC DEVELOPMENT

The availability of broadband networks is one factor that organizations take into account when deciding whether to move to or remain in a particular community. Other significant considerations include energy costs, ease of doing business, taxes, labor costs, education levels and availability of water – which may contribute in varying degrees from case to case.¹ As a result, it is difficult to make broad, data-driven generalizations about the precise role of broadband networks in stimulating economic development. Even so, several formal economic studies have sought to shed light on the relationship between broadband networks and economic development.

The first wave of these studies, which focused on first-generation, low-capacity broadband networks,² suggested that there was at least an association, and probably even a causal relationship, between broadband and economic development. As one of these studies concluded, “the internet plays an integral role in

helping small businesses achieve their strategic goals, improve competitiveness and efficiency and interact with customers and vendors.”³ These early studies also confirmed that broadband expansion can dramatically increase state GDP and tax receipts.⁴

Similarly, in a 2005 study, George S. Ford and Thomas M. Koutsy concluded that “broadband infrastructure can be a significant contributor to economic growth ... [and]

efforts to restrict municipal broadband investment could deny communities an important tool in promoting economic development.”⁵ The study “quantif[ied] the effect on economic development resulting from a community’s investment in a broadband network”⁶ by looking at Lake County, Florida, which developed a municipal broadband network in 2001 and provided access to the network to private businesses.

In comparing Lake County with

similar communities in Florida that did not have municipal broadband networks, Ford and Koutsy found that Lake County had “experienced 100 percent – a doubling – in economic growth relative to its Florida peer counties”⁷ since the deployment of the municipal network. The study points out that this doubling occurred despite the fact that these other counties “no doubt”⁸ had private broadband networks during the evaluation period.

WHAT IS ECONOMIC DEVELOPMENT?

Economic development comes in many forms, serves multiple purposes and means different things in different contexts. According to the U.S. Economic Development Administration,

Economic Development creates the conditions for economic growth and improved quality of life by expanding the capacity of individuals, firms and communities to maximize the use of their talents and skills to support innovation, lower transaction costs and responsibly produce and trade valuable goods and services. Economic Development requires effective, collaborative institutions focused on advancing mutual gain for the public and the private sector. ***Economic Development is essential to ensuring our economic future.***⁹

The World Bank defines economic development as follows:

The purpose of local economic development is to build up the economic capacity of a local area to improve its economic future and the quality of life for all. It is a process by which public, business and nongovernmental sector partners work collectively to create better conditions for economic growth and employment generation.¹⁰

The International Economic Development Council adopted a goal-oriented approach to economic development, which it describes as “improving the economic well being of a community through efforts that entail job creation, job retention, tax base enhancements and quality of life.”¹¹

Given the expansive definition of economic development, it is no surprise that there is no single strategy to support economic development. Indeed, a community’s particular circumstances and goals will heavily influence its economic development strategies and options.

Communities can focus on increasing the profitability of local businesses, increasing the *number* of local jobs, increasing the *quality* of local jobs or striking a balance among these goals.¹² They can seek to attract or retain a relatively small number of large companies, a larger number of small to medium-sized businesses or a combination of both. Communities can concentrate on their local economies, cooperate with neighboring communities or involve themselves in regional initiatives. They can attempt to support the growth of all local industries or target particular industries, such as high tech, health care, data centers, biosciences and so forth.

Once communities decide what they want to do, they typically have a wide choice of tools with which to work. They can offer tax incentives or loans and other financial enticements. They can establish improvement districts, enterprise zones and other kinds of development areas. They can improve roads, sewers, water facilities and other infrastructure. They can offer favorable terms and accelerate approval of franchises, permits and other necessary authorizations.¹³ They can support workforce development and training. They can use local government purchasing power to increase a targeted company’s sales, thereby reducing its risks. They can help aggregate demand within the community. They can seek grants, loans and other support from federal and state agencies, foundations and other organizations.

An increasingly important development tool is improving access to affordable, high-capacity broadband infrastructure. Even here, communities often have multiple options. They can work with willing incumbents, enter into public-private partnerships with new entrants, establish advanced communications networks of their own or develop other innovative approaches that work for them.

When communities lack good broadband access, corporate site selectors cross them off their lists and residents move away in search of better jobs.

In another 2005 study, analyzing data from 1998–2002, Sharon Gillett, William Lehr, Carlos Osorio and Marvin Sirbu found that communities in which mass-market broadband became available by December 1999 “experienced more rapid growth in employment, number of businesses overall and businesses in IT-intensive sectors.”¹⁴ Likewise, in a 2007 study, Robert Crandall, William Lehr and Robert Litan concluded that broadband increased nongovernmental employment by 0.2 to 0.3 percent and had a positive impact on GDP.¹⁵

In 2010, Jed Kolko found a “positive relationship”¹⁶ – one that “leans in the direction of a causal relationship, though not definitively”¹⁷ – between broadband expansion and local economic growth. Kolko’s study revealed that almost all industries showed a positive relationship between broadband expansion and local economic growth, particularly in industries that rely on information technology, such as utilities, information, finance and insurance, technical services, management of companies and administrative and business support services.

In their 2013 study, Brian Whitacre, Roberto Gallardo and Sharon Stover focused on the impact of broadband on the economic health of rural areas. Though they did not find a positive impact for broadband availability, they found that “high levels of broadband adoption in rural areas do causally (and positively) impact income growth ... as well as (negatively) influence poverty and unemployment growth. Similarly, low levels of broadband adoption in rural areas lead to declines in the number of firms and total employment numbers in the county.”¹⁸

Another economic benefit of broadband is that it enables existing businesses in a locality to expand their operations. The research firm Strategic Networks Group examines economic growth from this viewpoint. It identifies specific internet-related practices (such as web-based customer service or advertising) that businesses use to drive growth, and it relates them to incremental GDP, taxes and jobs. This bottom-up approach predicts varying economic impacts in different localities from increasing business internet usage.¹⁹

A 2016 report published by the Internet Innovation Alliance found that broadband internet, and the information and communications technologies that comprise and support it, when considered in the aggregate, produced \$1,019.2 billion in value added for the U.S. economy.²⁰

A study by the Hudson Institute looked specifically at the economic impact of rural broadband. It found that rural broadband companies contributed \$24.1 billion to the economies of the states in which they operated – \$17.2 billion through their own operations and \$6.9 billion through the follow-on impact of their operations – although the economic impact spread into urban areas of the same state. The study also concluded that the economic activity that rural broadband creates had supported 69,595 jobs, spread throughout the U.S. economy.²¹

Looking more closely at the economic development benefits a fiber network has on a particular community, Dr. Bento Lobo released a study in 2015 analyzing the effects Chattanooga’s fiber network had on the city.²² His analysis considered the effects of broadband on four categories: household effects, community effects,

business effects, and utility effects. For example, in household effects, Lobo used studies that showed how much consumers would be willing to pay for various levels of internet services. He then compared those numbers with what consumers pay in Chattanooga to demonstrate consumers’ surplus savings per month. His results show consumer surplus related to high-speed internet access ranges from \$33.2 million to \$76.2 million annually. Overall, Lobo’s findings conclude that Chattanooga’s fiber infrastructure generated economic and social benefits ranging from \$865.3 million to \$1.3 billion and created between 2,800 and 5,200 new jobs.

LACK OF BROADBAND AND ECONOMIC DECLINE

The studies discussed above focus on the benefits of broadband networks, but as broadband becomes both more necessary and more widely available, the disadvantages of lacking such networks have become easier to identify than the benefits of having them. Site selectors report that communities that lack suitable broadband infrastructure are routinely eliminated from consideration as potential sites for location or relocation.²³ In other words, although the presence of a robust broadband network may not itself be sufficient to persuade an organization to come to or stay in a community, the absence of such a network guarantees that potential employers will go elsewhere.

In a series of articles for this magazine, the most recent of which is on p. 71 of this issue, editor-at-large Steven S. Ross compared population growth or loss (as a proxy for job growth or loss) with broadband availability in all U.S. counties. He found that population in counties in the bottom half of their states in terms of access to at least 25 Mbps broadband grew at one-tenth the rate of the counties in the top half. The bottom 10 percent of counties in each state, in aggregate, actually lost population.²⁴

FIBER NETWORKS AND THE ECONOMY

The available economic research clearly demonstrates that broadband supports



In 2005, Google sited a data center in The Dalles, Oregon, because of the city's municipal fiber network.

economic activity and growth. So far, however, only limited data exists on the impact that a high-capacity fiber network have or can have on a local economy. The absence of more such data is not surprising, given the relatively recent emergence of fiber networks. The fact is, though, that one cannot yet make statistically rigorous general statements about the overall relationship between fiber networks and economic development.

One can, however, focus on more discrete questions. For example, it is clear that fiber networks enable hundreds of thousands of individuals to work from home, adding tens of billions of dollars annually to the U.S. economy. Many respondents to a 2010 survey by RVA LLC stated that fiber's reliability and speed made their employers more willing to allow them to telecommute or that fiber connections were necessary for their home-based

businesses to succeed.²⁵ In addition, fiber connectivity adds between \$5,000 and \$6,000 to the value of a \$300,000 home in the United States.²⁶

A series of studies conducted at the Chalmers University of Technology in Gothenburg, Sweden, specifically addressed the effects of broadband speed. In their first report, published in 2011, the researchers concluded that increases in broadband speeds contributed significantly to economic growth.²⁷ In a report published in 2013, the same researchers concluded that, in developed countries, the threshold level for broadband to have any impact on household income was 2 Mbps; gaining 4 Mbps of broadband increased household income by \$2,100 per year.²⁸ Given that fiber networks are capable of nearly unlimited speed, it appears that their potential economic impact is significantly higher than that of lower-capacity broadband.

Strategic Networks Group has looked at the impact of broadband speeds on individual small and mid-sized businesses. Its surveys showed that a minimum of 4 Mbps *upload* speed was necessary for these businesses to fully utilize the internet and increase their revenues significantly. About 71 percent of fiber users have access to 4 Mbps or higher upload speed, compared with much smaller percentages of cable or DSL users.²⁹

A study commissioned by the Fiber to the Home Council Americas in 2014 compared economic activity in 14 metropolitan statistical areas (MSAs) in which gigabit-speed connectivity was available to more than 50 percent of the households with economic activity in 41 similarly sized MSAs in the same states in which gigabit speeds were not available. According to the study's investigators, "our model suggests that for the MSAs with widely available

Cedar Falls, Iowa, was one of the first U.S. cities to offer fiber connections to businesses. In 20 years, the number of businesses in the town increased sixfold.

gigabit services, the per capita GDP is approximately 1.1 percent higher than in MSAs with little or no availability of gigabit services. These results suggest that the 14 gigabit broadband communities in our study enjoyed approximately \$1.4 billion in additional GDP when gigabit broadband became widely available.³⁰ Although this study focused on “early evidence”³¹ and was far from conclusive, it was consistent with the field experience of many communities.

What formal studies do not yet reveal is how many units of economic development a community can expect from a specific dollar investment in a fiber network under the unique conditions present in that community. Neither the data nor the analytical tools to do this will be available in the foreseeable future.

THE VIEW FROM THE TRENCHES

A huge and rapidly growing body of evidence confirms that, at least in some localities, advanced broadband networks can indeed spur positive economic development and create jobs. In nearly all communities, industries are increasingly reliant on high-bandwidth connectivity. The communities cited here have taken differing approaches based on their individual resources and economic development needs. Some make fiber available to businesses; others serve households as well. Some are more concerned with increasing the availability of broadband, and others focus on reducing its price. Some try to retain existing large employers, and others aim to attract new startups.

The common thread is that economic development officials are

working closely with existing and potential employers to identify, understand and meet their needs for advanced communications capabilities.

- **Brainerd Lakes, Minnesota:**

In the early 2000s, this area made substantial strides toward establishing itself as a tech center when the private sector, educators and local economic development agencies collaborated to bring high-speed fiber optics to the area. That proved to be a significant move and caught the attention of many tech companies looking for a place to expand or locate. The fiber optics, along with the area’s high quality of life, trained workforce, available building sites and existing office space established the Brainerd Lakes area as one of the most advanced technological markets in Minnesota and continues to garner widespread attention for that reason.³²

- **Brookings, South Dakota:**

Brookings’ fiber-to-the-home network is operated by the Brookings Municipal Utilities business branch, Swiftel. Steve Meyer, Swiftel’s general manager, attributes the network’s success to the following: “We like to think our advantage comes from great employees, and we’ve invested in state-of-the-art infrastructure, and we have the experience of serving customers for more than 100 years.”³³ Although the fiber network gets less press, it is one of the key factors driving growth in this university city. In 2014, 3M announced it would invest \$57.6 million in new, high-tech, automated equipment to manufacture medical tapes

and dressings.³⁴ The expansion adds 60 jobs, bringing total employment to more than 1,000 employees. Brookings is also home to Daktronics, which makes scoreboards and displays for sports teams and employs 1,600 people.³⁵ It has also become a hub for protein development companies.³⁶

- **Cedar Falls, Iowa:** In the 1990s, Cedar Falls Utilities built a citywide municipal hybrid fiber-coaxial network and provided fiber connections to commercial and industrial customers in both the city and the industrial park.³⁷ Over the years, Cedar Falls watched businesses from neighboring towns relocate to the area, in part because of the need for more bandwidth and greater internet capabilities.³⁸ Cedar Falls has now made the transition to all fiber and became the state’s first gigabit city in 2014. Jim Krieg, general manager of Cedar Falls Utilities, noted the growth fiber optics had generated: “Twenty years ago, [Cedar Falls] had 27 businesses and \$5 million in taxable valuation; today, there are 160 businesses and \$270 million in valuation.”³⁹
- **Chattanooga, Tennessee:** With its fiber-to-the-home network offering gigabit speeds throughout the city, Chattanooga has attracted several major companies, including Volkswagen, which has already spent more than \$1 billion building factories in the area and created 12,000 new jobs, as well as Homeserve USA and Amazon.⁴⁰ Chattanooga’s innovative, high-speed fiber network has also created an entrepreneurial boom in the city.⁴¹
- **Cumberland, Maryland:** Cumberland, Allegany County and the county board of education have partnered for 15 years on an innovative wireless infrastructure program that delivers high-quality services to government users and makes available both middle-mile and last-mile wireless capabilities for private ISPs that serve residential, business and health care customers.

The availability of these services, particularly in the most rural parts of the county, distinguishes the county from other rural areas. It has enabled the development of home-based businesses and attracted second-home buyers who otherwise would not have chosen to locate in the county.⁴²

- **The Dalles, Oregon:** The Dalles, a city of 11,873 residents in the picturesque Columbia River Gorge, operates a 17-mile municipal fiber optic network. In 2005, as a direct result of The Dalles' municipal networking capabilities, Google decided to purchase an industrial site there for \$1.87 million to house high-tech equipment that would be connected to the rest of the company's network. According to the man who coordinated the deal with Google, "It was visionary – this little town with no tax revenues had figured out that if you want to transform an economy from manufacturing to information, you've got to pull fiber."⁴³ The project was expected to create "between 50 and 100 jobs over a matter of time, earning an estimated average of \$60,000 annually in wages and benefits."⁴⁴ The Dalles succeeded so well that it recently paid off its network debt well ahead of schedule.⁴⁵
- **Danville, Virginia:** In contrast to The Dalles, Danville did not have a fiber network when AOL came looking for a site for a new data center. As a result, AOL struck Danville off its list of potential sites and located the center in Prince William County, Virginia.⁴⁶ After this setback, Danville developed a fiber network of its own. Now known as the "Comeback City," Danville used its fiber network to revitalize its economy, once the worst in the state with a 19 percent unemployment rate, and made the city a site of robust economic development, attracting Microsoft, IKEA and many other new, high-tech businesses.⁴⁷

Lafayette, Louisiana, has garnered attention in the tech sector, and both startups and established companies relocated to the area because of its internet connectivity.

- **Kendall County, Texas:** A cooperative telephone company, GVTC, began building out FTTH in the Texas Hill Country in 2004. It works closely with the Kendall County Economic Development Corporation to promote the network to businesses. As a result, the region's growth has outpaced the rest of Texas by 4 percentage points. Corporate site selection committees no longer reject sites in the county. An economic development official said, "If I don't have fiber, I'm eliminated – not just fiber to the business, because the executives are commuting to San Antonio and want to work from home because of gas prices. Fiber allows throughput and security."⁴⁸ Software companies, medical companies and aerospace companies have relocated to or stayed in the area because of the fiber network. Even Hill Country wineries, which constitute a small but tenacious local industry dating back to early German settlers, are now putting towns such as Fredericksburg and Boerne on vintners' maps.
- **Lafayette, Louisiana:** "When NuComm International needed to locate a new call center – one that would add 1,000 jobs ... to the local economy – it chose Lafayette, Louisiana, because the city is building a massive fiber network to connect everyone."⁴⁹ Lafayette has garnered attention in the tech sector, and many companies relocated to the area because of internet connectivity. In one example, "Scott Eric Olivier moved his tech startup firm, Skyscraper Holding, from Los Angeles to

Lafayette when he heard of the speeds and service offered by LUS Fiber."⁵⁰ Olivier says the same 100 Mbps connectivity that costs him \$200 per month in Lafayette, enabling him to move large files across the web, would cost him several thousand dollars a month anywhere else. In the past few months, Lafayette attracted three new employers that will bring 1,300 jobs into the city.⁵¹

- **Martinsville, Virginia:** Martinsville's fiber network enabled it to attract major businesses, such as defense contractor SPARTA Inc.'s research center, Mehler Technologies, American Distribution and Warehousing and ICF International (500-plus jobs).⁵²
- **Mesa, Arizona:** In the early 2000s, Mesa started placing conduit in its rights-of-way during capital construction projects and any other time a road was open. The city built a critical mass of conduit and fiber over a decade and a half, and it partners actively with private entities seeking access to conduit and fiber. Apple located a silicon research lab in Mesa, and the city credits the direct fiber connection to that facility as a significant part of the inducement for Apple and other entities to locate in Mesa.⁵³
- **Montgomery County, Maryland:** In the mid-1990s, Montgomery County developed a sophisticated revitalization and cultural plan for downtown Silver Spring, which had experienced steady economic deterioration and high retail and office vacancy rates. An important part of its vision for new opportunity and

The gigabit network in Wilson, North Carolina, has spurred an influx of creative-class entrepreneurs whose livelihoods depend on maximum upload capacity.

cultural vitality was attracting cultural institutions as anchors and creating means for schoolchildren in the county to benefit from those institutions. The county developed a strategy to connect potential cultural anchors over dark fiber and enable connectivity between the cultural anchors and public schools so students could see and experience events at the anchors. One of the first anchors the county connected with dark fiber was the American Film Institute (AFI); in subsequent years it connected other institutions, such as the Fillmore theater. This economic and cultural revitalization has been enormously successful, and the AFI Silver Theatre and Cultural Center and other fiber-connected cultural anchors have proved essential to the redevelopment of Silver Spring.⁵⁴

- **Powell, Wyoming:** In anticipation of the construction of a fiber-to-the-home system in rural Powell, a South Korean venture capital firm agreed to pay up to \$5.5 million to engage 150 certified teachers, working from their homes, to teach English to students in South Korea using high-speed videoconferencing.⁵⁵ The FTTH system has been so successful that the city was able to buy out its investors 18 years ahead of schedule.⁵⁶
- **Princeton, Illinois:** Princeton built a fiber network to retain Ingersoll-Rand as a major local employer; it now has more than 75 commercial customers, and most banks in town are connected with fiber. The broadband utility is regarded as attractive for potential employers.⁵⁷
- **Pulaski, Tennessee:** Local

economic development leadership has begun marketing Pulaski Electric System's services to nearby Huntsville, Alabama, home to a large number of defense and space industries. Before PES built its network, the community had never attempted to approach the defense or aerospace companies because it had little to offer that met their special needs. The FTTH network has allowed several existing industries to receive superior service at much lower prices than they paid previously. The system has become a focus of community pride and an example of the community's willingness to invest in the future.⁵⁸

- **Reedsburg, Wisconsin:** Reedsburg's FTTH system has allowed Lands' End to develop a virtual call center in which many of its customer service representatives work out of their homes.⁵⁹
- **RS Fiber Cooperative, Minnesota:** RS Fiber brought together 17 townships and 10 cities to build a fiber network that will bring high-speed internet to 6,000 homes and businesses in the region.⁶⁰ Though construction is ongoing, the economic impact is already being felt. The Minnesota College of Osteopathic Medicine will set up in a former school building in RS Fiber's footprint. School officials credit the fiber network with providing the necessary technological infrastructure to enable the college to locate in the area.
- **San Leandro, California:** San Leandro, located in the San Francisco Bay Area, competes with such tech giants as Silicon Valley for local businesses. In 2012, with

the goal of attracting modern, technology-based industries to San Leandro, the city established a partnership with a local business owner to create an ultra-high-speed fiber broadband network. The network, Lit San Leandro, is largely privately funded but utilizes the city's conduits to run the underground fiber network. Lit San Leandro is already attracting businesses to the area. For example, a 3D printing firm moved from San Francisco to a factory in San Leandro after considering more than 50 other locations. Similarly, a Kaiser hospital was built on the site of a former grocery distribution center, and the Westlake/OSIsoft Technology Complex, which includes three six-story, 300,000-square-foot tech offices, is located in a former Del Monte cannery.⁶¹

- **Sandy, Oregon:** SandyNet began when the city hall could not get a DSL connection, and city leaders realized businesses and residents faced the same problem.⁶² In 2015, Sandy, Oregon, completed construction of its FTTP network. Though it may be too soon to know whether businesses will relocate to Sandy as a result of the network, reactions from existing businesses and residents have been positive.⁶³ There may also be a new brewery in town soon.⁶⁴
- **Santa Monica, California:** Santa Monica's Information Systems Department mapped out a plan for the creation and expansion of its broadband network in 1998. Since then, the city has been slowly and methodically implementing its plan, saving city government \$700,000 a year in communications costs as well as making advanced communications capabilities available to private entities. In 2014, the city upgraded its fiber optic network speed to 100 Gbps.⁶⁵ The network has already contributed significantly to the city's economic growth.⁶⁶
- **South Bend, Indiana:** In the early 2000s, South Bend began

researching how to improve its telecommunications networks.⁶⁷ South Bend had fiber networks in place, but it was not in a position to develop and operate the networks itself. Because no existing providers were interested in establishing vendor-neutral fiber services through the city's infrastructure, South Bend worked with local partners to establish Metronet, a nonprofit, dark fiber network that serves government, educational and other nonprofit entities. Its for-profit subsidiary, St. Joe Valley Metronet (SJM), provides fiber access to banks, manufacturers and other businesses. The profits from SJM are paid to Metronet through dividends and help subsidize Metronet's continued operations and expansion. SJM has helped draw technology businesses to South Bend, from the GramTel data center in 2009 to the 2013 launch of a new coworking and meeting/conference space in the downtown area.

- **Westminster, Maryland:** The city of Westminster developed a plan to build a fiber-to-the-home network itself and partnered with a private company to operate the network.⁶⁸ Although the network is still under construction, the city has hit the ground the running, bringing new businesses to the community through its business incubator, MAGIC, and a new Smart Home project. These projects "explore new technologies that use the gigabit services available on the Westminster Fiber Network."⁶⁹
- **Wilson, North Carolina:** Since 2008, Wilson has owned and operated a gigabit, symmetrical, fiber-to-the-home network that is available to every home and business in the community. The network has moved Wilson to the top of the list for places that offer affordable, modern, next-generation lifestyles. The community has experienced an influx of creative-class entrepreneurs whose livelihoods depend on maximum upload capacity. Examples include ExodusFX.com,

a special effects film company, whose founders scoured the world for affordable housing and high capacity symmetrical broadband service and chose Wilson; radiologists who moved to Wilson because they wanted to work from home; and web designers, video artists and photographers who could finally upload their massive data files in minutes, not days.⁷⁰

These are a small handful of the many projects across the country that use advanced communications capabilities to support economic development and at the same time use the benefits of economic development to fund their networks and make them sustainable.

NEXT STEPS

The federal broadband stimulus programs invested billions of dollars in hundreds of middle-mile and last-mile projects across the United States. Most of these projects were completed only recently, and once they have a few years of operating experience under their belts, they will produce a wealth of information about what worked well and what did not in stimulating economic development.

The growing interest in gigabit networks is also likely to increase the understanding of how widespread availability of gigabit speeds affects economic development. Google Fiber's entry into the market, the gigabit projects of numerous community networks, and recent gigabit announcements by such private players as AT&T, C Spire Fiber, CenturyLink, Cox Communications and others have made "gigabit" a household word. In many communities, organizations such as the Mayors' Bistate Innovation Team (formed by the mayors of Kansas City, Kansas, and Kansas City, Missouri) are emerging to analyze and stimulate economic development and other uses for the new gigabit connectivity.

Useful analytical approaches and devices are emerging to help communities reap the economic benefits of advanced broadband. For example, Strategic Networks Group

has developed tools to measure and analyze broadband utilization and benefits to businesses, organizations and households.⁷¹ These tools, backed by a growing database that currently covers more than 16,000 businesses and 12,000 households, can provide detailed analyses of the economic impacts of broadband utilization and enable businesses and organizations to compare themselves with other entities of comparable size and other characteristics. As the databases grow, they will become increasingly valuable.

In addition, communities that have advanced communications capabilities are increasingly talking to one another, sharing resources and lessons learned, and collaborating when possible.

BROADBAND COMMUNITIES has sought to facilitate such exchanges by hosting a series of national and regional economic development conferences. Communities also share experiences through forums organized by such organizations as the Coalition for Local Internet Choice, Next Century Cities and the Fiber to the Home Council Americas.

Over time, the path from broadband investments to economic development should be faster, more efficient and less costly to navigate. ❖

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Endnotes are available in the digital edition of this article at www.bbcmag.com.