TAXPAYERS PROTECTION ALLIANCE

GON with the Wind:

The Failed Promise of Government Owned Networks Across America

May 2020

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The Taxpayers Protection Alliance (TPA) is a rapid response taxpayer group dedicated to analyzing and researching the consequences of government intervention in the economy. TPA examines public policy proposals through a non-partisan focus, identifying how government waste and overreach impacts taxpayers and consumers regardless of the political party responsible.

TPA holds government officials in the United States, and around the world, accountable through editorials, statements, coalition letters, public interest comments, and radio and television interviews. TPA recognizes the importance of reaching out to concerned citizens through traditional and new media, and utilizes blogs, videos, and social media to connect with taxpayers and government officials.

While TPA regularly publishes exposés and criticisms of politicians of all political stripes, TPA also provides constructive criticism and reform proposals based on market principles and a federalist philosophy. TPA empowers taxpayers and consumers to make their opinions known to their elected and non-elected officials and embraces bold solutions to hold an ever-growing government in check.

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Introduction

There is no disputing the importance of internet connectivity in the 21st century economy. The question is whether the private sector should continue taking the lead in funding and facilitating the deployment of broadband or whether taxpayers should create and fund/subsidize government-owned networks (GONs) to do so. Supporters of taxpayer-funded broadband systems claim that governments (i.e. taxpayers) are needed to build these systems because the private sector simply will not. The truth is that broadband providers have spent more than $1.6 trillion since 1996 to build, upgrade, and maintain networks, resulting in a 71 percent growth in rural broadband. Internet infrastructure is in place to serve 98 percent of the country, primarily built by telecom companies.[1]

This inconvenient truth, however, has not deterred attempts to use taxpayer dollars to fund broadband boondoggles.

Reminiscent of the Broadway hit The Music Man, telecom consultants ride into town and promise inexpensive networks that will attract thousands of customers. Some consultants even promise high take rates (percentage of subscribers to the service). A consultant, for example, estimated that Sun Prairie, Wisconsin could capture 30 percent of the market if it offered internet through Sun Prairie Utilities.[2] But, the project only attracted about 5 percent of potential customers in its first few years and was sold to TDS Telecommunications Corp. in 2017.[3]

In 2015, consultancy CTC Technology and Energy prepared a “Feasibility Study” for the City of Seattle, Washington for a proposed taxpayer-funded fiber-to-the-premises (FTTP) enterprise.[4] Unsurprisingly, the business produced optimistic take rates for this proposed project; CTC claimed, “the overall take rate the Broadband Utility might realize, based on survey projections, is approximately 41 percent.”[5] Even if these projections were realistic, a take rate of 41 percent would still result in a negative cash balance after 10 years. The consultancy’s findings, however, were based on survey projections, despite actual consumer follow-through typically being less than initial survey estimates.

CTC admitted, “These numbers are likely to shift and change over time and may not always be as favorable as they are in our initial projections…Given the anticipated reaction from the competition, Broadband Utility take rates are likely to fluctuate, particularly downward.” These caveats are supported by the findings in this GON report, which estimates that average weighted take rates nationwide are below 40 percent. Furthermore, the consultancy noted that a “54 percent residential and a 27 percent business take rate” would be necessary for the Broadband Utility to generate cash flow in the communications space. Despite these projections and precarious reliance on survey estimates, the consultancy suggested that taxpayer-provided broadband services “could be sustainable in Seattle.”[6]

Uptown Services served as the consultant for the extremely troubled Salisbury, N.C. project, and even GON proponent Christopher Mitchell of the Institute for Local Self-Reliance noted the consultant has a poor track record of producing reliable take rate forecasts. As a result of Uptown Services' lackluster record, its client networks "have encountered significant challenges in their business plans," including Provo, Utah, and Alameda, California.[7]

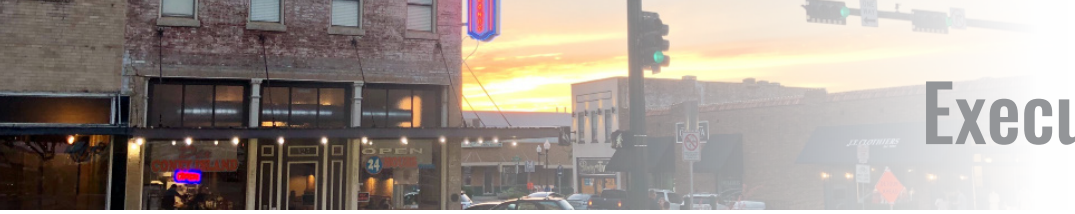
In 2018, officials from the Tennessee Comptroller of the Treasury expressed concern with plans to build a government network in Johnson City, Tennessee, after consultant Magellan Advisors, a leader in the GON consulting field, estimated a 45 percent take rate. Comptrollers said the plan did not address the impact of market competition on pricing.[8]

The Taxpayers Protection Alliance (TPA) undertook this "broadband penetration" study for two primary reasons. First, TPA wants to provide a baseline of information regarding the actual number of broadband customers and associated broadband penetration rates for a large cross-section of GONs. This database includes 30 GONs of varying sizes spread across 18 states. TPA's motivation is to eliminate some of the confusion and misrepresentations regarding the track record of various GONs with respect to their market penetration.

Second, TPA wants to provide community decision-makers who are considering investing in a GON with a tool to help them judge the reasonableness of the assumptions and credibility of any "feasibility study" that advocates for such an investment. This tool is a verifiable and reliable database of the actual performance of existing GONs with respect to the number of broadband customers and the scope of penetration.

To establish a verifiable track-record for each GON, a two-step process was utilized. The first step involved collecting data that GONs have reported in public documents. Sources included but were not limited to: annual financial reports (Comprehensive Annual Financial Reports—CAFRs); ongoing operating performance reports to bondholders;[9] and annual filings with state electric and telecommunications utility boards. The second step involved sending a FOIA (Freedom of Information Act) request to each GON where additional information was needed to complete the database. FOIA requests were sent to 26 of the 30 GONs. The following GONs did not comply with the FOIA requests: Bristol, VA; Harlan, IA; Monmouth and Independence, OR; Lafayette, LA; and Spencer, IA.

Despite the unfortunate habit of policymakers ignoring the financial and viability problems posed by GONs, these taxpayer-funded networks may soon be on their way out thanks to the ever-changing technological landscape. As the United States continues deployment of 5G wireless services and cable companies lay more fiber that will bring faster service to customers without taxpayer subsidization, local officials may soon realize that GONs are an unnecessary and inefficient use of households' hard-earned dollars.



Executive Summary

•The simple average broadband penetration in 2018 across all of the GONs for which data was obtained was 40.3%.

•The weighted average broadband penetration (i.e. total broadband customers for all GONs divided by total structures passed by GONs) was 36.8% in 2018.

•There is some variation in broadband penetration by the size of the network. Communities with fewer than 10,000 homes passed had a weighted average penetration of 35.8%, communities with between 10,001 and 20,000 homes passed had a weighted average penetration of 58.2%, and communities with more than 20,000 homes passed had a weighted average penetration of 35.4%.

•There is a great deal of variation in the penetration rates among the GONs. Salisbury, NC had the lowest penetration at 16.7%; Cedar Falls, IA, had the highest penetration at 73.7%.

•The simple average broadband penetration for commercial customers in 2018 was 40.8%, with a high of 86.4% in Longmont, CO, and a low of 7.8% in Marshall, MI.

• The 2018 simple average commercial broadband penetration was 26.9%.

•GONs are not insulated from the realities of the competitive telecommunications marketplace. Over the past five years of data gathered (2014-2018), weighted-average video penetrations have declined from 31.8% to 26.5%. “Cord cutting” is just as real for GONs as the for-profit players in the broader telecommunications market. The fragmentation of the video market generally – as consumers subscribe to such streaming services as Netflix and Hulu instead of paying for cable – shows how treacherous it can be to count on additional revenue streams to help support the internet business of GONs.

•The same could be said about voice services, which dropped from an average usage of 23.6% in 2009 to 20.6% in 2018 as more and more customers dropped their home line and use cell phones exclusively.

•Further underscoring the competitive and financial realities of GONs is the fact that 5 of the 30 GONs in this study sold their operations to “for-profit” entities. As noted above, Salisbury, NC leased its Fibrant network to Hotwire Communications in 2018; Bristol, VA sold its Opti-Net Network to Sunset Digital in 2016; Burlington, VT sold its Burlington Telecom business to Schurz Communications in 2019 (2017 sale agreement finally approved by Vermont Public Utilities Commission in 2019); Groton, CT sold its Thames Valley Communications subsidiary to CTP Investors, LLC in 2012; and Crosslake, MN sold its communications network to Tri-Co Technologies in 2016.

•Taxpayers in Salisbury, NC; Bristol, VA; Burlington, VT; Groton, CT and Crosslake, MN suffered substantial losses on the sale of their GONs.

Overview of Each Government Owned Network

Bristol, VA

Once touted by the Federal Communications Commission (FCC) as an example of the potential for community broadband, Bristol Virginia Utilities' (BVU) OptiNet was later sold to a private provider after mismanagement and corruption led to huge taxpayer losses.

BVU's board of directors and the Bristol City Council agreed in 1999 to build the broadband network to enhance communications between the utility's electric subdivisions, later deciding that year to expand the system to connect city facilities and schools.[10]

The council first wanted to partner with a private provider to expand the network to serve areas homes and businesses, but eventually decided to make the expansion itself and began deployment in 2002. A partnership with the Cumberland Plateau Planning District Commission yielded state and federal grants to help OptiNet expand beyond the Bristol city limits in southwest Virginia to service business and industrial customers.[11]

Year: 2002 (Fiber to the Home-FTTH)

Population: 16,482[12] in the City of Bristol, Va.; (BVU provides electricity to more than 16,100 consumers in a 125-square-mile service area, composed of Bristol, Va., and portions of Washington and Scott counties in Virginia and neighboring Sullivan County, Tenn.)

Cost: $132.4 million as of June 2015 ($30.06 million Tobacco Commission; $22.7 million NTIA/BTOP; $79.64 million Bonds and operating cash flow)[13]

Broadband customers: Unknown.

The network was available to about 35,000 homes and businesses by 2012 and OptiNet eventually counted more than 13,000 subscribers. Reported profits of up to $2 million a year eventually turned to deficits, as OptiNet began to show annual losses after its 2013 peak.[14]

Corruption played a role in the financial trouble. Three men, including two high-ranking officials at BVU, pleaded guilty in 2015 to schemes involving falsified invoices and kickbacks and received prison sentences.[15]

That same year, an audit of BVU found the utility had long-term debt of $48 million, meaning the reported profits were merely a mirage. While $24.4 million of that was on OptiNet's books, the actual debt incurred by the broadband division may have been higher because money was borrowed from the electric division to aid construction and operational costs.

Audits also showed that the network was given advantages from BVU not available to private providers, including reduced pole attachment rates.

Bristol, VA

In 2016, local provider Sunset Digital offered to purchase the network for $50 million, which was approved by the board of directors and the city council.

Because OptiNet cost more than $130 million to build and operate, the $50 million sale price meant that tens of millions of dollars in taxpayer money was squandered. City taxpayers got hit the hardest as the majority of the money came from municipal bond issues, but about $52 million was used from federal funds for OptiNet as OptiNet cost more than $130 million to build and operate, including $28.4 million from the federal stimulus program under President Obama.

The sale took over a year to complete, however, as the various granting agencies sought to make sure that either terms of the grants were fulfilled, or they got a rebate of their money.

Bristol city leaders were disgusted that they wouldn't be getting any proceeds from the sale.[16] A 2009 agreement between Bristol and BVU stipulated thee entities would split any proceeds from the sale of OptiNet once all debts were satisfied, but the sale price didn't come close to satisfying those debts. For example, the Virginia Tobacco Revitalization Commission provided $30 million to create the network, but only got back $8.7 million, while the U.S. Economic Development Administration received a return of $1.23 million on its $7.3 million buy-in.[17]

Brookings, SD

Swiftel Communications provides video, voice, data, wireless networks, cable service and Voice over Internet Protocol (VoIP) to Brookings with fiber-to-the-premise throughout the city. Swiftel has Sprint PCS wireless stores in Brookings, Watertown and Sioux Falls, South Dakota, as well as Sioux City, Iowa.

The Utility is one of several enterprises operated by Brookings Municipal Utilities (BMU). BMU manages the operations of the city's electric, water, wastewater, and telecommunication utilities. BMU was established in 1899. The city purchased the telephone utility in 1903.[18]

Year: 2007 (FTTH)

Population: 24,509[19]

Cost: Unknown.

Funding method: Unknown.

Structures passed: 6,747

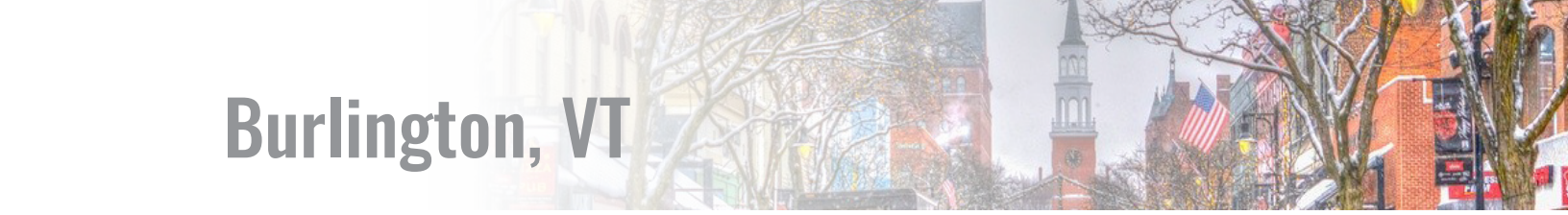
Broadband customers in 2018: 4,787 (4,257 residential and 530 commercial)

Broadband penetration in 2018: 70.0%[20]

Video and voice customers in 2018: 1,156 video and 4,700 voice; 17.3% residential video penetration and 73.2% residential voice penetration[21]

The telecommunication division of Brookings Municipal Utilities started providing dial-up Internet service in the 1990s. The name was changed to Swiftel in 1997. In 2002, Swiftel upgraded to DSL. By 2006, Swiftel had started construction of a Fiber to the Home (FTTH) network. Swiftel began providing voice, video, and Internet services over fiber to businesses and residents in 2010.[22]

The Brookings broadband network was one of five such government projects examined in a University of Pennsylvania study with cash flow so small that it would take more than 100 years to cover project costs. The study's authors estimate it would take Brookings 349 years for the network to show a profit.[23]



Burlington, VT

The Burlington City Council voted in November 2017 to sell Burlington Telecom to Schurz Communications for $30.8 million, recovering only $7 million of a $17 million loan fronted by taxpayers through the city's general fund to keep Burlington Telecom afloat. The city agreed to sell the business to settle a lawsuit with Citibank, which sued after Burlington Telecom defaulted on a loan.[24]

The Vermont Public Service Commission determined Burlington Telecom violated its certificate of public good by not repaying that loan within 60 days of receiving the money, but still allowed the sale to go through because it determined it didn't have authority to block a sale for the purposes of enforcing conditions of that certificate.

Vermont Digger reported that the city's credit rating tanked after then-mayor Bob Kiss used the $16.9 million to aid Burlington Telecom, dropping six levels by Moody's metrics.[25]

Year: 2006 (FTTH)

Population: 42, 899[26]

Cost: $33.5 million (CitiFinancial)[27]

Broadband customers in 2018: 7,465[28]

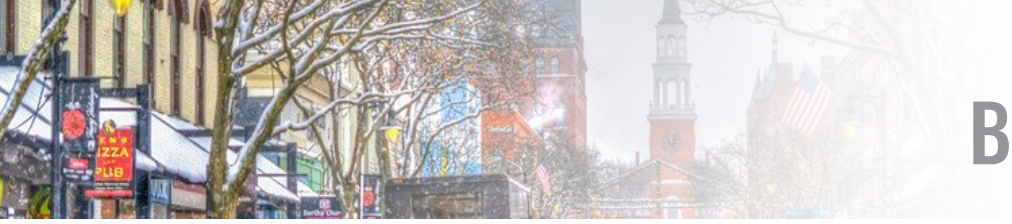
Broadband penetration: Unknown due to lack of information on structures passed

In February 2010, as the controversy brewed, *Vermont Biz* reported that Burlington Telecom's operating license stipulated that all of the approximately 20,000 homes and businesses should have been connected to the network by September 2008, but 3,200 lacked access at that time.[29]

The outlet reported that the 4,800 subscriber accounts weren't generating enough funds to make Burlington Telecom sustainable, and in fact the business carried a debt load of about $50 million at the time due to low subscriber numbers and higher-than-expected costs to build the network.[30]

According to *WCAX*, The number of subscribers had risen to about 7,000 in November 2017.[31]

Tim Nully, who directed Burlington Telecom upon its creation in 2001 until 2007, told *Vermont Biz* in 2010 the business had been poorly run after his departure, with about $14 million dollars unaccounted for. Nully advocated for more transparency in the telecom's financial numbers, which Kiss had resisted, arguing that would provide an advantage to private competitors.



Burlington, VT

After Schurz Communications bought Burlington Telecom, it established a local affiliate, Champlain Broadband, to manage the business after the sale. In October 2019, city leaders were deciding whether to use proceeds from the sale to invest in Champlain Broadband, with a deadline of March 2020 to make a decision.[32]

Mayor Miro Weinberger was proposing a $2.4 million investment that would give Burlington a 7.5 percent stake in Champlain Broadband, pointing out that amount would give the city a seat on the board of directors and provide "a voice at the table to ensure that all the many public benefits we secured in the transfer agreement are honored and enforced in the years to come."

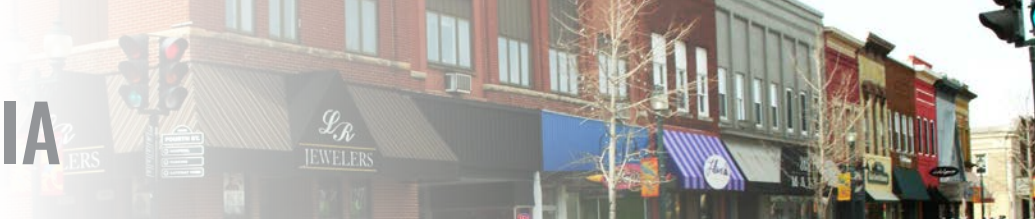
Councilman Franklin Paulino was strongly opposed to the investment, asking, "why would we spend… significant taxpayer dollars…in this company, when we have other more safe investments, opportunities in capital improvements that could be done?"[33]

The Vermont Supreme Court was set to hear arguments on an appeal from a citizens group that argued the public service commission shouldn't have approved the sale because the city wouldn't recoup all of the taxpayer money provided for the loan.

The group pointed to the Burlington city charter, which states that "any and all costs associated with the investment of cable television, fiber optic, and telecommunications network and telecommunications business-related facilities, are borne by the investors in such a business, and in no event are borne by the City's taxpayers."[34]

Burlington has become a cautionary tale in Vermont. As Brattleboro city officials discussed proposals in 2019 to build their own municipal network, assistant town manager Patrick Moreland described Burlington's failure as "the elephant in the room."[35]

Cedar Falls, IA



Cedar Falls Utilities (CFU) began to study creating an internet network in the early 1990s and the Cedar Falls City Council voted to establish a Municipal Communications Utility and transferred the authority to the CFU board of trustees. City voters gave approval for the network and a $3 million general obligation bond issuance to fund it in 1994, with 71 percent saying "yes."[36] The network started with a hybrid-fiber coaxial (HFC) network that launched cable TV service in 1996 to the town of then 34,000 people. Broadband services were added in 1997 and voice services were added in 2016.

In 2011, CFU overbuilt the network with high-capacity fiber in order to improve the service and provide gigabit speeds. In a study on municipal networks, the New York University Law School pointed out that "in its push to modernize and join the ranks of other 'gig cities,' Cedar Falls assumed a significant amount of debt with limited evidence that consumers wanted ultra-fast Internet connections. As a result, the system has experienced some financial volatility, which has led to a credit downgrade."[37]

Year built: 2011 (FTTH); 1995 (HFC-Hybrid Fiber Coax)

Population: 41,048[38]

Cost: $25.3 million ($19.3 in 2009-2010--$15 million revenue bonds, fiber overbuild; $2.3 million, expansion—Rural Utilities Service Broadband Initiatives Program)[39]; $6 million in 1995-- HFC cost ($3 million general obligation bonds; $3 million loan from CFU)[40]

Structures passed: 19,191

Broadband customers in 2018: 14,151

Broadband penetration in 2018: 73.7%[41]

Video and voice customers in 2018: 8,851 video; 2,956 voice;[42] 46.1% video penetration; 15.4% voice penetration[43]

The funding for the expansion included a $2.32 million general obligation bond that the city can repay through many mechanisms, including raising property taxes. It also included a $2 million loan from the electric division and a federal grant of nearly $843,641.[44]

CFU drew controversy when President Obama visited Cedar Falls in 2016 to tout federal funding for government-owned broadband and his plan to overstep state authority to limit the growth of municipal networks. In a press release, Mediacom said choosing the town as the venue for his speech "clearly shows that the White House wants to waste taxpayer dollars to supplant our Nation's private sector broadband providers with government-owned utility companies."[45]

Chattanooga, TN

Chattanooga Electric Power Board's (EPB) high-speed internet network is often held up by government-broadband advocates as a shining example of success, but the system wouldn't have been built without massive government subsidies and studies have shown it's not financially feasible even with taxpayer handouts.

EPB's board of directors agreed to begin an internet project to serve local residences and businesses in 2007 with a $50 million loan from the electric division kicking off planning and construction. EPB broadband was also funded by $162 million in local revenue bonds and $111.5 million from the federal stimulus.

George Ford, chief economist for the Phoenix Center for Advanced Legal and Public Policy Studies, found that those federal subsidies EPB received to build the network amounted to $2,000 per customer.[46]

Adoption of the gigabit speeds was slow due to the high price for a subscription. *The Economist* noted that in 2012 only two businesses and nine homes paid the $350-per-month rate being charged at the time.[47]

EPB eventually lowered rates and got more subscribers for the gig service. Total fiber subscribers reached 100,000 in 2018, a market penetration rate of about 60 percent.[48]

Some private providers told *Tennessee Watchdog* they avoided entering the Chattanooga market because they couldn't compete with the financial advantages EPB received from taxpayer money.[49]

Year built: 2009 (FTTH)

Population: 180,557[50]

Cost: $390 million ($226.8 million in revenue bonds, $111.6 million in federal Department of Energy stimulus, $50 million line of credit from the EPB electric division, various bank loans and lines of credit)[51]

Structures passed: 181,885 (157,702 residential and 24,183 commercial)[52]

Broadband customers in 2018: 90,251 (83,377 residential and 6,874 commercial)

Broadband penetration: 57.2% overall (52.9% residential and 28.4% commercial)

Video and voice customers in 2018: 57,149 video customers and 32,603 voice customers; 31.4% and 17.9% penetrations, respectively.[53]

Chattanooga, TN

A 2017 study from the University of Pennsylvania Law School pointed out that while EPB showed $2 million in positive cash flow between 2010 and 2014 it would take 412 years to repay the initial project cost at that rate. Including the stimulus funds provided by the federal government would increase the payback time to 683 years, the study noted.[54]

EPB was one of the biggest advocates in pushing for a ruling by the FCC under former Democratic chairman Tom Wheeler to overrule state laws prohibiting the expansion of city-owned networks.[55] That was reversed when Republican Ajit Pai took the chairman's seat.

Clarksville, TN

CDE Lightband is a municipally-owned public power and broadband service provider serving 70,000 electric and approximately 20,000 broadband customers within the city limits of Clarksville, Tennessee. The Clarksville Department of Electricity (CDE) began providing internet services through its CDE Lightband fiber network at the beginning of 2008.

A $55 million bond initially funded the system, approved by citywide referendum. City officials later borrowed an additional $20 million to pay for cost overruns and operational expenses. *Beacon Impact* noted in 2018 that Clarksville taxpayers still owed $17 million of the initial $55 million bond.[56]

Year built: 2008 (FTTH)

Population: 156,794 in 2019[57]

Cost: $75 million (Electric Revenue Bonds with asset lease agreement from the broadband division as well as loans from the electric division)[58]

Structures passed: 69,429

Broadband customers in 2018: 19,896 (18,425 residential; 1,471 commercial)

Broadband penetration: 28.7% [59]

Video and voice customers in 2018: 6,023 video and 2,622 voice; 8.7% and 3.8% penetrations, respectively [60]

Some of the money used to fund the system was borrowed from the electric division. CDE spokeswoman Christy Batts told *Tennessee Watchdog* in 2014 that the broadband division was paying about $4.5 million in cost allocation back to the power division annually.[61]

CDE Lightband, which provides a "triple play" of services to its customers, wanted to expand outside its city limits to service customers, but was prohibited by state law.[62] The FCC, under former Democratic chairman Tom Wheeler, attempted to supersede state laws and allow such expansion, but the effort was struck down in the courts.[63]

The *Tennessee Star* reported that service experienced a spate of outages in recent years which raised the ire of customers. That outlet pointed out that officials touted that the network would be more reliable than legacy private providers when they pitched the network to Clarksville residents.[64]

Coldwater, MI

The city of Coldwater decided to start its own telecommunication system in 1997, but voters initially balked at the idea. City residents rejected a ballot proposition to fund the $6 million system with a general obligation bond, but voters later approved a $4.5 million revenue bond to fund the system.[65]

The Coldwater system initiated its cable television, high-speed data and long-distance reseller service in July 1998. In addition, the Coldwater system took over the dial-up internet service business of the local library. At that time, the library was the only local Internet Service Provider in Coldwater and it had 1,500 dial-up accounts.[66]

Year built: 1998 (HFC)

Population: 12,250 in 2019[67]

Cost: $4.5 million (revenue bonds)

Structures passed: 5,736

Broadband customers in 2018: 1,751

Broadband penetration: 31.6% [68] [69]

Video and voice customers in 2018: 859 video (Skitter TV customers)[70] and 279 voice; 15.5% and 5.0% penetrations, respectively[71]

Coldwater is considering an upgrade to its existing community network cable infrastructure by investing in fiber optic upgrades to connect homes and businesses. In 2020, the Coldwater Board of Public Utilities (CBPU) says it will make a formal recommendation to the city council to replace the system's Hybrid Fiber Coaxial (HFC) with faster, more reliable Fiber-to-the-Home (FTTH) infrastructure. If approved, the project is expected to cost $4 million and will take two years to complete.[72]

Concord, MA

The citizens of Concord voted in 2009 to authorize Concord Municipal Light Plant (CMLP) to build a 100-mile fiber optic network as a backbone for a smart grid and then used the network to deliver high-speed internet access to homes and businesses, beginning in 2015.[70] The city initially considered providing both internet and cable services. Prior to CMLP getting into the business, Beacon Hill Institute pointed out the municipality would be entering a crowded market that included Verizon, DirecTV, Comcast and EchoStar.[73]

CMLP only provides broadband services—they do not provide video or voice services. In 2016, CMLP initiated the Concord Light Broadband service. At the end of 2016, there were 680 broadband customers. That is a penetration rate of 13.5%. [75]

Year built: 2014 (FTTH)

Population: 20,000[76]

Cost: $4 million (Bond anticipation notes)[77]

Structures passed: 5,328 (5,030 residential and 298 commercial)[78]

Broadband customers in 2018: 1,207 broadband (1,112 residential and 95 commercial)

Broadband penetration: 24.0%

The Berkman Klein Center for Internet & Society at Harvard University noted in a 2017 study that the financial paybacks on Concord's project were not fully covering debt service and operational costs.[79]

CLMP's policy on blocking content raised the ire of FCC Commissioner Michael O'Rielly, who argued the utility's broad policy for blocking content it deemed harmful or offensive at "its reasonable discretion" could violate the First Amendment. "Such an enormously discretionary provision gives absolutely no notice of what speech is proscribed, and, moreover, allows those enforcing the speech code to do so in an arbitrary and discriminatory manner," O'Rielly said. [80]

Crosslake, MN

Prior to its sale to a private provider in 2016, Crosslake Communications was founded in 1925 and was a city-owned and operated utility of the City of Crosslake.[81] Crosslake Communications has provided local phone service to customers since 1925, adding cable television in 1983 and internet services in 1997.

In 2005, Crosslake Communications commenced the upgrade of telecommunications infrastructure to a FTTH network distribution system over a proposed five-phase deployment. The intent of the strategic network plan was to provide all of the utility's customers with FTTH by the end of the five-phase period. The portion of the project financed through the issuance of earlier bonds was commenced in the summer of 2005 and was completed in 2007.[82]

Year built: 2007 (FTTH)

Population: 2,213[83]

Cost: $2.485 million ($2.485 million in revenue bonds)

Services: Internet, cable, and telephone

Structures passed: 2,885

Broadband customers in 2014: 1,478[84]

Broadband penetration: 51.2% [85]

Video and voice customers in 2014: 1,887 video and 1,627 voice; 65.4% and 56.4% penetration, respectively

A 2015 report from the Minnesota Office of Broadband Development found that Crosslake's service only delivered a download speed of 20 megabits per second (5 Mbps upload), a metric that didn't meet the FCC's broadband standard of 25 Mbps.[86]

On August 16, 2016, Crosslake sold its communications network to Tri-Co Technologies for $6,372,000.[84] Tri-Co and Crosslake Communications, which retained its name, were part of a partnership called Lake Partners that unsuccessfully bid in 2018 to obtain Lake Connections from Lake County, another government-owned network project that saw taxpayers suffer significant losses.[88]

Greenville, TX

In December 2000, the Greenville Electric Utility System Board of Trustees authorized the execution of an $8.2 million cable construction contract with VECTREN Communications Services. GEUS held a public hearing on December 14, 2000 concerning the issuance of bonds for cable operations and improvements to the electrical distribution system. The proposal called for $4.5 million in bonds to be issued for the $8.2 million cable project. The remainder of the project was paid for by GEUS cash reserves.[89]

On June 29, 2001, GEUS employees connected the system's first customer to the first municipally-owned cable television and high-speed internet operation in Texas.[90]

Year built: 2001 (HFC)

Population: 28,263[91]

Cost: $8.2 million ($4.5 million in bonds and $3.7 million in interdepartmental loans)

Services: Internet and cable access only (GEUS is prohibited from offering voice services)

Structures passed: 13,404

Broadband customers in 2018: 4,137 (3,817 residential and 320 commercial)

Broadband penetration: 30.9% [92]

Video and voice customers in 2018: 3,151; 23.5% penetration

Community Networks posted that GEUS broadband was in 4,500 homes and businesses by 2005,[93] but the network has not only not grown, but has shrunk in the past 14 years, as the numbers provided by GEUS for this report show that the system has just 4,137 customers as of December 2019.

GEUS's broadband network provides connections to about 80 percent of residents, the same as private provider Spectrum, but GEUS's download speeds top out at 100 megabits per second,[94] while Spectrum offers speeds of up to nearly one gigabit per second, or 10 times as fast.[95] As of December 2019, GEUS charged $95.95 monthly for the 100 Mbps speed, a rate more in line with gigabit speeds for residential customers in many other jurisdictions.

Groton, CT

The failure of Groton's entry into the broadband business serves as a key cautionary tale of government-owned internet as high operational costs and low consumer demand led to a massive debt for which local taxpayers were ultimately responsible.

Thames Valley Communications, Inc. (TVC) was a wholly-owned subsidiary of the City of Groton, Connecticut. TVC provided video, high-speed data and telephone services for the residential community and businesses for the Town of Groton and four adjacent communities. TVC competed with Comcast and AT&T U-verse in all market segments and with DirecTV and Dish Network for video customers. TVC initiated service in 2006.

According to a Groton Utilities official quoted in a study by New York University, the initial idea behind the city broadband was to offset sagging electricity revenues. The city also considered selling bottled water to make money, according to that study.[96]

Year built: 2006 (HFC to residential; FTTH to businesses)[97]

Population: 40,115 (2010)[98]

Cost: $34.5 million (initial construction and costs to expand the network between 2006-2008)[99]

Structures passed: 26,293

Broadband customers in 2012: 5,592

Broadband penetration: 21.3%[100]

Video and voice customers in 2012: 7,228 video and 2,348 voice; 27.5% and 8.9% penetration, respectively[101]

In spite of TVC's operational successes, it had struggled financially to build a sustainable enterprise. Although TVC's revenues tripled between 2006 and 2012, it did not achieve operational break-even (i.e. revenues exceed operating expenses) until 2010. In 2011, TVC's revenues were $3.787 million below its operating, debt service and capital costs. Likewise, in 2012 and beyond, the TVC operation was going to require a $2.5 million subsidy per year from the City of Groton absent privatization.[102]

In 2013, the City of Groton sold its municipally owned communications system to CTP Investors for $550,000.[103] The City of Groton's taxpayers were still responsible for the $27.5 million of debt that TVC amassed as a result of the system construction and the accumulated losses from 2006-2012.[104] The city also saw a drop in its credit rating due to the debt burden put on it by the broadband network.

Harlan, IA

More than two decades ago, Harlan Municipal Utilities (HMU) began offering cable television and internet access to the city of 4,800 via a hybrid fiber-coaxial network in 1996. HMU started offering voice services in 2001. In 2012, Harlan started upgrading to a Fiber-to-the-Home network. [105]

Year built: 2012 (FTTH); 1995 (HFC)

Population: 5,106[106]

Cost: $2.7 million[107] for 1995 (Utility revenue bonds and grant from Commerce Department); FTTH cost $1.76 million (internal funds and loan)[108]

Services: Internet access, voice, video

Broadband customers and penetration in 2018: HARLAN DID NOT RESPOND TO THE FOIA REQUEST; based on estimates by Television & Cable Factbook in 2016, there were 862 broadband customers[109] and a broadband penetration of 31.0%[110]

Video and voice customers in 2018: HARLAN DID NOT RESPOND TO THE FOIA REQUEST;[111] based on estimates by Television & Cable Factbook and HMC filings with the Iowa Utilities Board, in 2018 there were 1,259 video customers and 846 voice customers; video penetration and voice penetration of 45.3% and 30.4%[112], respectively.

Highland, IL

Highland is home to Illinois' first citywide municipal FTTH network, having been built on the back of American taxpayers through President Obama's stimulus package.

In a series of three referendums, the community voted to begin the process of building a fiber network. During the last referendum on the matter (in April 2009), the community voted overwhelmingly (75% in the affirmative) to authorize the network with revenue bonds from the American Recovery and Reinvestment Act that would be backed by electrical revenues from the city's public power company.[113]

Year built: 2010 (FTTH)

Population: 9,850[114]

Cost: $9 million

Funding method: Revenue bonds (taxable Build America Bonds, backed by electric system revenue, issued as part of American Recovery and Reinvestment Act)[115]

Structures passed: 4,724

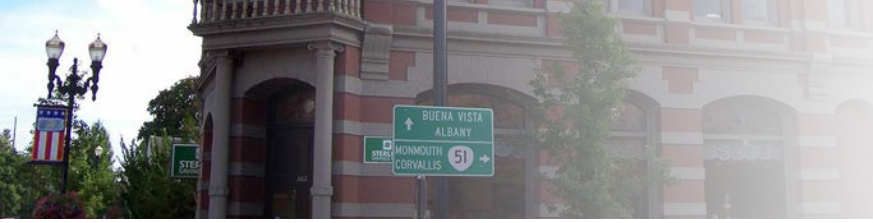
Broadband customers in 2018: 1,979 (1,741 residential; 238 commercial)

Broadband penetration: 41.9%[116]

Video and voice customers in 2018: 1,010 video and 951 voice; 21.4 % and 17.6% penetrations, respectively[117]

Highland Communications Services provides a triple-play of services—broadband, video and voice. In May 2018, the Highland City Council voted to reduce the cost of its "Gig-a-Share" plan from $399.95 to $94.95. While the move to cut rates for the 1 gigabit-per-second plan by more than 75 percent was celebrated by some, others noted it was long overdue. Angela Imming, the city's director of technology and innovation, told the *Belleville News-Democrat* that a then-recent assessment showed the city's plan price didn't align with market value – although the high gigabit rate had been in effect since the system was started.[118]

Imming admitted in 2019 that the initial customer capture rate was "flat," although she didn't point to the gigabit rate as the reason, saying instead that the city "had not convinced people to leave the perch of Charter Communications."[119]



Independence and Monmouth, OR: MInet

Monmouth and Independence are two cities about 15 miles southwest of Salem. In 2004, both cities formed the Monmouth Independence Network (MInet), an Oregon Revised Statute (ORS) 190 organization. The cities provided the funding to lay a fiber network in both communities and are responsible for revenue bonds they have issued to help fund MInet, as well as for the loan guarantees of MInet bank loan. MInet began offering voice, video and broadband services in April 2006.[120]

The creation was not without its difficulties. Engineers discovered there were more homes and apartments than was initially counted, resulting in the cities taking out an additional $2.5 million in loans to connect them all. As construction costs soared, MInet took out more loans, owing $3.7 million to KeyBanc and $14.6 million to the Oregon Business Development Department. This led to MInet restructuring $17.8 million of its debt through municipal general obligation bonds in 2010.[121]

Year built: 2006 (FTTH)

Population: 10,154 (Independence)[122]; 10,503 (Monmouth)[123]

Cost: $27 million (Revenue bonds and bank loans)[124]

Services: Internet access, voice, video

Broadband customers and penetration in 2015: MInet DID NOT RESPOND TO THE FOIA REQUEST; based on a consulting report by CCG Consulting in December 2015, MInet had 4,708 broadband customers [125] (No Passing information available)

Video and voice customers in 2015: MInet DID NOT RESPOND TO THE FOIA REQUEST; based on the consulting report by CCG Consulting in December 2015 MInet, had 2,022 video customers and 1,564 voice customers[126] (No Passing information available)

The general manager was fired and two reports were commissioned in 2013 and 2016 to improve efficiency. Although by 2016 the network was covering its operational expenses, it was still not making all of its debt payments, the Institute for Local Self-Reliance reported.[127]

MInet has been looking to expand its network to nearby locations as a way to increase its revenues.[128] In 2018, MInet entered into a partnership to build Willamette Valley Fiber, a FTTH network in the City of Dallas.[129]

Although taxpayers paid for the construction of the networks, MInet is keeping its records sealed and company officials did not respond to Freedom of Information Act requests seeking information about financials and customer take rates to include in this report.

Jackson, TN

Jackson Energy Authority (JEA) launched its EPlus Broadband network in 2004, but not without its share of controversy that included pushback from Jackson residents.

JEA's tumultuous journey into the telecommunications business began after it submitted its telecommunications business plan to the Comptroller of the Treasury in January 2002. After the plan was approved, the Jackson City Council voted in 2002 to allow JEA to issue up to $60 million in revenue bonds to fund the venture, as well as for the city to guarantee the repayment of these bonds.[130] Some citizens did not agree with the City Council's decision and launched a petition drive to have the vote authorizing the bonds reversed. Ultimately, the petition drive failed to garner the necessary number of votes so the decision of the Council remained. Since 2002 there have been two unsuccessful petition drives in Jackson to have a referendum to have city taxpayers vote on the taxpayer guaranteed bonds.[131]

Year built: 2004 (FTTH)

Population: 66,903 in 2019[132]

Cost: $54.3 million (Revenue bonds; loans from electric utility)

Structures passed: 35,699

Broadband customers in 2018: 15,029

Broadband penetration: 42.19%[133]

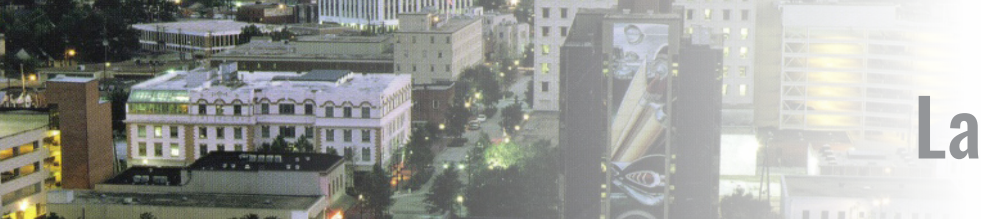
Video and voice customers in 2018: 12,992 video and 5,817 voice; 36.4% and 16.3% penetrations, respectively[134]

Aeneas Internet & Telephone sued the city of Jackson and JEA in 2003, claiming the city-backed bond to launch JEA into the telecommunications business violated state law. The suit was dismissed later that year.[135]

On September 16, 2003, the Telecommunications Division issued $54.3 million in Adjustable Rate Taxable Revenue Bonds, Series 2003A and 2003B, to assist in the financing of the fiber optic broadband network telecommunications system in the City of Jackson.[136]

In January 2004, JEA was awarded a certificate of "convenience and necessity" from the Tennessee Regulatory Authority to provide cable, internet and phone services.[137] JEA Telecommunications Division initially offered video and data services to the city of Jackson. These services were offered over a FTTH network. Telephony services were provided over JEA's network, but are provided by a third party, (Aeneas Internet and Telephone).[138]

Since 2012, J04 has offered telephony services over its own network.[139]



Lafayette, LA

In June 2005, voters in Lafayette took to the polls to demand better connectivity. The community overwhelmingly endorsed the network in 2005, authorizing LUS to issue $125 million in revenue bonds to build it. What residents have gotten is a system that is deeply in the red and also lacks transparency – as research for this study has shown.

A few years and several lawsuits later, LUS bonded for $110 million in 2007, began building the network in 2008, and started connecting customers in 2009.[140] The fiber-optic government-owned network in Lafayette is fully operational and LUS Fiber offers television, broadband, and telephone service throughout the city. As of May 2013, the system had attracted 14,000 customers, about one-third of its total potential subscribers.[141]

Year built: 2009 (FTTH)

Population: 126,143[142]

Cost: $160 million[143] (Revenue bonds and loans from the electric system)

Structures passed: 50,857

Broadband customers in 2018: 19,809[144]

Broadband penetration: 39.0%[145]

In a recent study by the University of Pennsylvania, telecommunications policy researchers noted, "LUS Fiber operated at a negative $36.1 million in cash flow from 2010 to 2014, which was the largest loss in absolute terms of the 20 projects in this study and the third largest loss on a per-household basis (behind Monticello, MN, and Kutztown, PA). Poor operations have led management several times to push back the date that operations were projected to become self-sustaining." "Despite the negative cash flow, a search of news reports failed to reveal any allegations that LUS Fiber may be struggling financially or may be about to default on any of its obligations. The fact that revenue grew at a healthy annual rate of nearly 36 percent from 2010 to 2014 suggests there may be some reason for optimism, the study states."[146]

The Communications System collected $38.6 million in operating and miscellaneous revenues in 2018, as compared to the budgeted $39.7 million. Operating expenses were under-budget at $20.3 million, as compared to the budgeted $21.3 million.[147] Total debt in 2018 for LUS was $138.7 million as compared to $148.7 million in 2014.[148] Those financial numbers were obtained from the NewGen Strategies & Solutions Consulting Engineers Report. LUS declined to provide records to the TPA through its Freedom of Information Act (FOIA) request. Although local taxpayer money is at stake, Louisiana law exempts the network from FOIA requests because the customer data is considered proprietary.

Longmont, CO

Longmont Power & Communication took advantage of its previous fiber assets to expand services to residents. Longmont initially attempted to enter the communications business in 1997 by partnering with Adesta Communications, but that company encountered financial problems and declared bankruptcy. One result of the bankruptcy, however, was that Longmont became the owner of the "fiber–ring" constructed by the defunct Adesta.[149]

In 2009, residents first attempted to pass the referendum to lift the state restrictions on municipally-provided internet service. Although this attempt failed with 56 percent of voters saying no, the residents did not give up, passing a referendum in 2011. Longmont Power & Light commissioned a Broadband Feasibility Report that was published in May 2013 and initial construction began that fall. The city passed a revenue bond issue and issued $38.035 million for the project in 2014. The city utility department built up a network offering speeds of up to one Gigabit-per-second (Gbps) to residents and businesses. The city offers broadband and voice services only though its communications network branded NextLight.

Year built: 2014; Some fiber assets deployed in 2009

Population: 96,577[150]

Cost: $52.3 million ($45.3 million from revenue bonds secured by electric and broadband revenues) and $7 million from loan from the electric utility[151]

Structures passed: 34,460

Broadband customers in 2018: 18,947 (18,107 residential and 840 commercial)

Broadband penetration: 55.0%[152]

Video and voice customers in 2018: 2,546 (2,046 residential and 500 commercial); 7.6% penetration[153]

In 2017, the city issued an additional $7.27 million of revenue bonds and borrowed $7 million from the Electric Utility. *Complete Colorado* pointed out that, as a result, power customers are subsidizing broadband consumers. While, in theory, the loan from the electric division will be paid back, electricity customers would see an increase in rates if the broadband division were to fail.[154]

Complete Colorado noted that standard rates for subscribers who didn't sign up early for NextLight were comparable to legacy providers in Longmont, and the lack of cable services put NextLight at a disadvantage for customers wanting package deals.[155]

Marshall, MI

The Marshall City Council approved the engineering, design and construction of its fiber network FiberNet in March 2017.[156] The city started connecting customers by the end of 2017 and completed the network construction in 2018 at a cost of $3.1 million, which included loans from the electric division of the city utility. The network offers speeds of between 50 megabits per second and 1 gigabit per second.[157]

Marshall Director of Electric Utilities Ed Rice admitted the local government had an advantage over private providers as it pertained to pole attachments necessary to run the fiber, "The city had an advantage because we are a municipal electric utility," he told the *Battle Creek Enquirer*. "It was pretty straightforward to get the fiber attached to the poles, because sometimes that could be a pretty convoluted process."[158]

Year built: 2018 (FTTH)

Population: 7,005[159]

Cost: $3.1 million (Interdepartmental loans, Marshall's Local Development Financing Authority)[160]

Services: Internet access only

Structures passed: 5,890

Broadband customers in 2018: 1,130 (1,064 residential and 66 commercial)

Broadband penetration: 19.2%[161]

Theodore Bolema, founding director of the Institute for the Study of Economic Growth at Wichita State University, told *Michigan Capitol Confidential* that obtaining right-of-way access is one of the most expensive and time-consuming parts of building out broadband.

"Marshall is letting its municipal internet service have that access for free with no delays in getting regulatory approvals," Bolema said. "If Marshall can make it so easy for its own service to get access, then presumably the city could make it just as easy for any private company to come into Marshall."[162]

Progress was initially slow as FiberNet had captured less than one-fifth of Marshall's approximately 7,000 residents in its first year – and a cost-benefit analysis only anticipated the city capturing 38 percent of available customers long-term.[163] This could be attributed in part to significant competition by private companies. Both AT&T and EarthLink cover about 80 percent of the city, offering download speeds of up to 100 Mbps. *Broadband Now*, which tracks broadband availability across the country, reports that Marshall has above average broadband competition with an average of 3.87 providers per census block. Less than 17 percent of Marshall residents have one or fewer options for home internet service.[164]

Monticello, MN

Unlike the vast majority of municipal fiber networks built in the U.S., Monticello did not operate its own municipal electric company. Instead, Monticello developed a partnership with local telecommunications provider HBC to deliver services. Under the terms of the agreement, Monticello would own the network and HBC would operate it. In May 2005, the City Council appointed a task force to investigate options for the community and a feasibility study was completed in 2006. In September 2007, Monticello held a referendum to build the network and issue $26.5 million in revenue bonds, which passed with 74% of the vote.[165]

TDS Telecom filed a lawsuit as the city was in the process of selling the bonds. The lawsuit claimed that Minnesota law prohibited a city from using revenue bonds to finance the project. The city of Monticello prevailed in the lawsuit and various related appeals and in 2009, Monticello began constructing the network.[166] Fibernet began connecting customers in mid-2010.[167]

Year built: 2010 (FTTH)

Population: 13,747[168]

Cost: $10 million (revenue bonds and court settlement)

Services: Internet access, voice, video

Top Residential Speed: 1 Gbps symmetrical

Structures passed: 4,341

Broadband customers in 2018: 1,549[169]

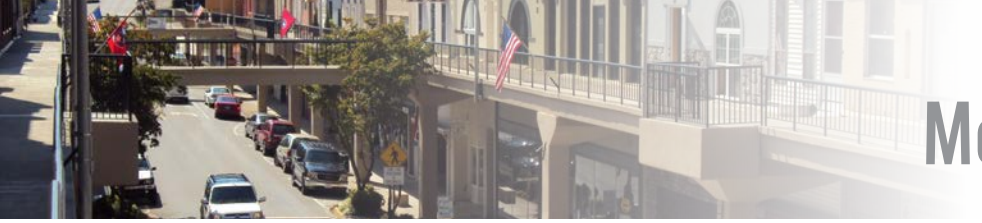
Broadband penetration: 35.7%[170]

Video and voice customers in 2018: 451 video and 383 voice; 10.4% and 8.8% penetrations, respectively[171]

By 2012, FiberNet had just 1,270 subscribers among a population of 13,000 residents. As a result of the lack of revenues generated by the network, the project began running a deficit of more than $500,000 a year. Monticello government leaders began bailing out FiberNet by giving the network non-public loans using tax dollars, including a $3.1 million loan from the city's Liquor Fund and $323,000 from the General Fund. Even that wasn't enough, and soon the city defaulted on its bond payments.

After losing $4 million of taxpayer money on the project and failing to make payments on its debts, a court oversaw a settlement agreement requiring that the city pay $5.75 million to bondholders and Well Fargo, the bond trustee.[172]

A national study of municipal networks by the University of Pennsylvania found that the Monticello project had the highest cost per household of all networks studied with a tab of $5,549 per home. Based on recent cash flow figures, the network has still not managed to turn a profit.[173]



Morristown, TN

FiberNet, the fiber network in Morristown, began providing local businesses with internet service in 2006 through Morristown Utility Systems. According to one study, although it's been in operation for more than a decade, FiberNet hasn't gained a strong enough foothold among city residents that it is likely to ever turn a profit.[174]

City elections in 2004 brought in a mayor and some new council members who claimed that the public tasked them with exploring a city-owned cable and internet service. Morristown surveyed local interest and filed a business plan with the state comptroller. Residents voted in a referendum for the city to enter that business, so FiberNet was created, with the first customers receiving service in May 2006.[175]

Year built: 2006

Population: 29,926[176]

Cost: About $18 million (General obligation bonds)[177]

Services: Internet access, voice, video

Top Residential Speed: 1 Gbps symmetrical

Structures passed: 14,324

Broadband customers in 2018: 5,168[178]

Broadband penetration: 36.1%[179]

Video and voice customers in 2018: 3,495 video and 2,306 voice; 24.4% and 16.1% penetrations, respectively[180]

Then, in 2012, the network began providing gigabit speeds to the homes, businesses, and community anchor institutions in the city. FiberNet has competition from AT&T who also offers gig service in Morristown.[181]

Morristown was one of 11 municipal networks (out of 20 examined) studied by the University of Pennsylvania that is unlikely to ever recoup the cost to construct and operate it based on recent cash flow history.[182] The Beacon Center of Tennessee found in 2018 that FiberNet was still $11.6 million in debt.[183]

Muscatine, IA

In 1996, Muscatine Power & Water (MP&W) conducted a feasibility study on establishing a municipal communications system. The plan developed in the feasibility study was approved by 94 percent of Muscatine voters in a referendum. MP&W initiated construction of its 750 MHz, two-way, hybrid fiber coaxial cable system in 1997 and launched its video service on March 23, 1999. In September 1999, MP&W launched its high-speed data service.

The Muscatine Communications System (MCS) was designed to provide communications services to the citizens of Muscatine as well as cable television headend services for Wilton, Iowa. The system was initially financed with an $18 million loan from Muscatine Power & Water's electric utility. In November 2002, MP&W's communications system agreed to purchase Mediacom's Muscatine cable system for $9 million, removing the largest competitor from the market. That transaction was closed on January 3, 2003.[184]

Year built: 2019 (FTTH); 1997 (HFC)

Population: 23,817 in 2019[185]

Cost: $34.5 million ($18 million HFC system, $9 million purchase of Mediacom's cable system, and $7.5 million fiber upgrade; all financing from interdepartmental loans)

Structures passed: 13,931

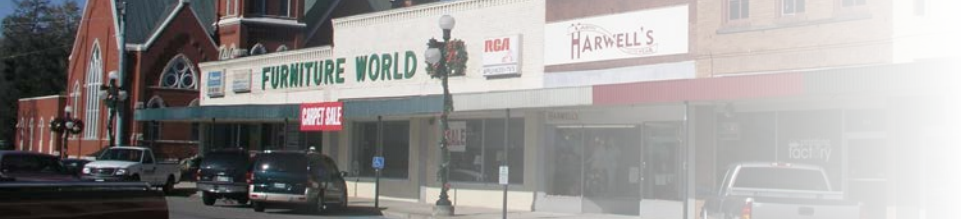
Broadband customers in 2018: 8,719 (8,161 residential and 558 commercial)

Broadband penetration: 62.6%[186]

Video and voice customers in 2018: 5,924 video and 123 voice; 42.5% and 1.5% penetrations, respectively[187] [188]

In November 2014, MP&W's electric utility approved an amendment to the electric utility's interdepartment loan to the communications utility, effective January 1, 2015, that included loan forgiveness of $25,327,000, changing the fixed interest rate from 3.53% to 0.50%, and modifying the amortization of the note from a 30-year period to a 20-year period.[189] The loan forgiveness meant that Muscatine's electric division was out $25 million and its users would have to make up the difference.[190]

Muscatine Power & Light started the upgrade of its municipal operation in 2017 with the intent of bringing municipal cable network customers up to FTTH technology. The firm that was awarded the contract was able to introduce several alternatives that reduced the initial cost estimate of $8.7 million to $7.5 million.[191]



Pulaski, TN

Pulaski city leaders were initially wary of getting into the internet business. A low penetration rate and financial studies predicting that the network will likely never pay back its initial cost are indications the city should have stuck to its original inclination.

In 2003, the leadership of PES Energize network undertook a feasibility study as well as a customer survey focused on the feasibility of establishing a publicly owned fiber network in Pulaski. At that time, the city's leadership was not confident about the results.

Two years later, city and utility leadership felt that they were ready and completed a second feasibility study. This time, the results suggested a better outcome if Pulaski decided to invest in a publicly-owned fiber network. In the spring of 2005, Pulaski developed a business plan that was approved in March by Tennessee's State Comptroller, as required by state law. In May, the city council voted to issue $8.5 million in General Obligation (GO) bonds to finance FTTH deployment and a data center.

Year built: 2007 (FTTH)

Population: 7,652[192]

Cost: $8.5 million (General obligation bonds)[193]

Structures passed: 6,823

Broadband customers in 2018: 2,541 (2,204 residential and 337 commercial)

Broadband penetration: 37.2%[194]

Video and voice customers in 2018: 1,721 video and 961 voice; 25.2% and 14.1%, respectively[195]

Construction started in 2006, with fiber following the path of the existing power lines. When the lines were aerial, the fiber was installed on poles, and when lines went underground, the new network followed suit. PES took the same approach with street lines and drops to homes. Line construction was completed in September 2006; the utility finished its Network Operations Center in November and began testing right away.

PES Energize began offering residential triple-play of cable TV, phone, and high-speed internet services in January 2007, but its formal launch was not until that spring.

A 2017 study by the University of Pennsylvania found that the project cost per household in Pulaski was $2,425, but the system was only generating revenue of $797 per household. That examination found the Pulaski system to be one of the worst-performing municipal networks as its cash flow was so miniscule that it would take 490 years to recover the cost to build it.[196]

Reedsburg, WI

Reedsburg first entered the telecommunications business in 1998 when Reedsburg Utilities Commission (RUC) constructed a small fiber ring to monitor the city's water and electric systems as well as to connect some of the school buildings. During the buildout process, companies along the line requested to be connected to the network. Soon, RUC was planning to create a FTTH network. The city completed the FTTH construction in 2006 and had a take-rate of over 70% by 2009.[197] That number dropped to 62.5%, however, over the next decade.

Year: 2002

Population: 9,522[198]

Cost: $13.5 million ($5 million loan from local bank and $8.5 million in revenue bonds)[199]

Structures passed: 5,125

Broadband customers in 2018: 3,204[200]

Broadband penetration: 62.5%[201]

Video and voice customers in 2018: 1,537 video and 2,050 voice; 30% and 40% penetrations, respectively[202]

Reedsburg rebranded its service as LightSpeed in May 2018 to tout that it provided a minimum gigabit speed to its customers.

Located about an hour outside of Madison, Reedsburg received a $5.2 million award from President Obama's stimulus in 2010 to expand its network into Sauk County.[203] Reedsburg also received a $440,000 state taxpayer-funded grant in 2018 to offer service to the communities of Delton and Spring Green. These expansions would be illegal in many states.[205]

Dave Bangert, owner of WiConnect, Inc., a rural Wisconsin broadband provider, told the *Milwaukee Journal-Sentinel* he feared that the federal stimulus grant enabling the expansion into Sauk County could put him out of business. At the time, Bangert had created a business using wireless transmitters mounted on farm silos to provide signals to more than 500 customers in the Reedsburg area.[206]

Bangert told the newspaper it was unfair he had to compete with a taxpayer-funded service. "I don't want to be a complainer," he said, "but I want people to know how some government decisions affect a small business like mine." He said he applied for $1 million in funds from the stimulus but was denied.[207]

Salisbury, NC

The taxpayers of Salisbury, North Carolina granted themselves a reprieve from runaway GON costs, when, in May 2018, citizens voted to lease the city's municipal broadband project, Fibrant, to a private provider. Eighty-one percent of voters agreed to allow Hotwire Communications to take over the failing network, which is now known as Fision. The lease will last for 20 years, with Hotwire paying back the city 30 percent of its revenue from its internet and 10 percent of revenue from video and phone services.[208] The city rolled out Fibrant in 2010, but the system has been a financial drain on Salisbury taxpayers since its construction.

Year: 2010 (FTTH)

Population: 33,834[209]

Cost: $29 million[210] (Revenue bonds)

Structures passed: 19,522

Broadband customers in 2018: 3,261

Broadband penetration: 16.7%[211]

Video and voice customers and penetrations in 2018: 1,643 video and 1,154 voice; 47.0% and 33.0% penetrations, respectively[212]

Legacy providers AT&T and Time Warner reduced their rates after Fibrant began operations, which led to the municipal broadband network never meeting subscriber goals of 30 percent of city residents. The shortfall resulted in the city borrowing money from its water and sewer reserves to pay operating expenses. Salisbury had been losing about $3 million per year operating Fibrant before the lease.[213]

Combining the initial bond for construction and the loan from the reserve, Salisbury borrowed around $40 million for Fibrant, and still owes about $32 million. Revenue from Fibrant was so meager for so many years that Salisbury was just paying interest on the loans and not any principal.[214]

A study by the University of Pennsylvania found that Fibrant cost $2,224 per Salisbury household to build, but was only generating an average revenue of $340 per household.[215]

Investor service Moody's downgraded Salisbury's bond rating after the city raided its reserves to prop up Fibrant. The city also had to restructure $25 million of tax-exempt financing into taxable financing due to leasing its system to a for-profit company, which increased the interest rate.[216]

Salisbury sent out requests for proposals in January 2017, and received some interest from providers in purchasing Fibrant outright. But according to an informational page on the City of Salisbury website created to educate voters on the issue "Hotwire's proposal provided the best opportunity for the city to improve the finances of the Fibrant system, while ensuring continued high-quality communication services,".[217]

Sallisaw, OK

In 2004, the city built a FTTH network, deploying fiber both on utility poles and underground. In 2005, DiamondNet began serving Sallisaw, as the first municipal network in Oklahoma to offer triple-play services.

Interest in upgrading Sallisaw's cable and phone system arose in the early 2000s. The cable television system had been around since the early 1980s and was very limited in terms of the programming available. Additionally, both the cable and phone company changed ownership numerous times during the 1990s and early 2000s, with very few upgrades to either system. The possibility of providing broadband internet access via the traditional methods (DSL or cable modem) seemed remote. In late 2002, city staff began researching the possibility of providing telecommunications services to the community. The preliminary research and feasibility study took approximately 14 months to complete.

Year built: 2005 (FTTH)

Population: 8,450[218]

Cost: $7.5 million (revenue bonds)

Structures passed: 4,204

Broadband customers in 2018: 1,891 (1,643 residential and 248 commercial)

Broadband penetration: 45.0%[219]

Video and voice customers in 2018: 1,172 video and 1,087 voice; 27.9% and 18.9% penetrations, respectively[220]

An interview with city management posted on the Oklahoma Cooperative Extension Service's website said that city leaders requested in its feasibility study an estimate of what would be needed to build the system.

"The consultants came back with an estimate that was very close to actual expenditures. After everything was ready, the Sallisaw Municipal Authority, a public trust of the City of Sallisaw, issued 15-year revenue bonds for approximately $7.5 million to finance the project," a city staff member said in that interview.[221]

"Our actual 'begin' date as far as preparing for construction and selecting equipment vendors began in January of 2004. The city began actual construction in August of 2004 and received the first video signals into our headend in December 2004. The official launch of DiamondNet was in April 2005," the staff member said.[222]

Sandy, OR

Sandy, Oregon is different than most GONs as it is not part of an electric utility. SandyNet is a stand-alone municipal internet service utility. SandyNet started as an internet service provider in 2002. During its early history, SandyNet provided customers connectivity via a variety of technologies—wireless (Wi-Fi network), DSL and fiber.

In 2010, SandyNet phased out its DSL service and concentrated on wireless and fiber connectivity. In 2014, SandyNet issued $7.5 million in revenue bonds to finance a FTTH telecommunications network. The system borrowed an additional $500,000 to pay for extra construction costs for expansion to cover the entire 3.14 square miles of the city and offer service to every resident. About 2,000 residents took advantage of an offer for free installation during the construction phase.[223]

Year: 2014 (FTTH)

Population: 11,326[224]

Cost: $7.5 million (revenue bonds)[225]

Structures passed: 3,762

Broadband customers in 2018: 2,597

Broadband penetration: 69.0%[226]

Video and voice customers in 2018: Approximately 25 video and 201 voice;[227] 0.7% video penetration; 5.3% voice penetration[228]

SandyNet offers broadband, voice and video services—video services are provided by a third-party.

Spencer, IA

Spencer (population 11,000) is located in the northwest section of the state. In a public referendum in 1997, 90 percent of those casting votes supported building a communications system that would be owned and operated by Spencer Municipal Utility.[229] SMU financed the project through an $8 million "interfund" transfer disguised as a loan, made at a below-market interest rate of 4.5 percent while the electric utility was paying 5.75 percent on the funds it borrowed.[230] A second $8 million was raised in electric utility revenue bonds that were used to fund the cost of the actual fiber and coaxial cable.[231] Since 2000, the municipal utilities department has supplied water, electric, video, telephone and internet services.

Year built: 2013 (FTTH); 2000 (hybrid fiber-coax)

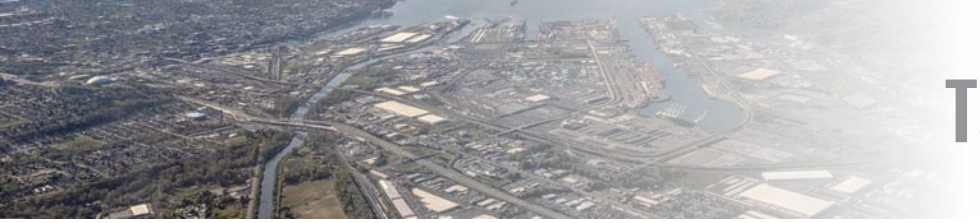
Population: 11,031 in 2019[232]

Cost: About $6.5 million (loan from the Electric utility); FTTH cost $19.2 million (bank loan and internal funds)[233]

Broadband customers and penetration in 2018: SMU DECLINED TO RESPOND TO THE FOIA REQUEST; based on estimates by Television & Cable Factbook in 2018 there were 2,000 broadband customers[234] and a broadband penetration of 32.1% based on 6,230 structures passed.[235]

Video and voice customers in 2018: SMU DECLINED TO RESPOND TO THE FOIA REQUEST; based on estimates by Television & Cable Factbook and HMC filings with the Iowa Utilities Board in 2018 there were 3,464 video customers and 5,137 voice customers; video penetration and voice penetration of 55.7% and 82.6%,[236] respectively.

SMU replaced its hybrid fiber-coax system with a complete fiber-to-the-home system in 2013. The FTTH construction was completed in four phases during the 2013-2019 time period.[237]



Tacoma, WA

Tacoma's Click! Network is one of the country's oldest municipal broadband networks, and throughout its history, the network has been plagued by cost overruns, underperformance, and efforts to close down the operation and/or sell it off. This open access system, launched in 1998, provides three commercial telecommunication services to customers of Tacoma Power: retail cable television, wholesale broadband transport and wholesale high-speed Internet over cable modem.

In December 2000, the Tacoma City Council considered selling the Click! Network as a way to avoid a surcharge on electricity bills to cover the operating losses of the network. The Council ultimately decided not to sell the network and approved the surcharge.[238]

In September 2016, the Tacoma City Council approved a plan to use Tacoma Power ratepayer funds and rate revenues to fund Click!'s upgrade and operations in future years.[239]

Year: 1998 (HFC)

Population: 216,279[240]

Cost: $105 million (financed by loans from Tacoma Public Utilities-TPU)[241] ;$140 million revised estimate[242]

Structures passed: 116,072

Broadband customers in 2018: 21,825 wholesale broadband customers

Broadband penetration: 18.8%[243] [244]

Video customers in 2018: 14,680; 2.6% penetration[245]

On June 22, 2017, plaintiffs filed a suit in Pierce County Superior Court alleging that Tacoma Power had been unlawfully subsidizing the capital expenses and the operational and maintenance expenses of Click! Network. The plaintiffs requested an immediate cessation of all such subsidies and a refund of Tacoma Power electric utility customers' funds spent subsidizing these operations for the three previous years (alleged to be in excess of $21 million).[246]

On March 2, 2018, the Court granted plaintiffs' motion for partial summary judgment, ordering that Tacoma Power electric utility revenues and funds may not lawfully be used to pay for Click! Network expenses or capital improvements. The city filed a motion for discretionary review of the Superior Court order, and the Court of Appeals granted a stay of the Superior Court proceedings. On June 14, 2018, the Court granted review of this matter.[247]

Tacoma, WA

On December 11, 2019, the Court of Appeals reversed the Superior Court ruling and concluded that it is lawful for the City of Tacoma to subsidize the network's operations.[248]

Tacoma's Public Utility Board voted in October 2019 to hand over operations of Click! Network to local private provider Rainier Connect, citing financial struggles.[249]

"We have been operating at a loss for a number of years, this past year we did substantial budget cuts that are not sustainable," TPU Utilities Director Jackie Flowers said at the meeting, noting that Click! had been operating at a loss for ten years and its infrastructure was outdated.[250]

UTOPIA, UT

The Utah Telecommunication Open Infrastructure (UTOPIA) has become a poster child of wasteful spending. The project was highlighted in TPA's Dirty Dozen Report published in 2017. UTOPIA is an all-fiber network owned by a consortium of rural Utah towns across a sparsely-populated region north of Salt Lake City, and serves as a powerful cautionary tale about the financial dangers of government broadband due to its massive taxpayer losses.

UTOPIA provides an open access network, allowing private service providers to use the infrastructure to offer retail digital services to customers in UTOPIA member cities.

In 2002, UTOPIA was formed when 16 cities in Utah agreed to jointly build a fiber-optic network. Eleven of the cities pledged to finance the project with bond issues backed by $202 million of sales tax revenues. UTOPIA was initially financed with $135 million in bonds.[251]

Planners intended to build UTOPIA in three phases over a three- or four-year period and the first phase was completed in 2005. However, by 2007, UTOPIA was behind the projections in its original plan (including offering services to only 12 percent of the number of projected subscribers and providing full service to only three cities and partial service to three others), encountered management difficulties and had to replace its management team amid significant financial struggles. UTOPIA had to revise its original business plan as well as seek additional funding, including a $21 million loan from the U.S. Department of Agriculture's Rural Utilities Service (RUS).[252]

Year: 2003 (FTTH)

Population: About 453,000 (about 158,000 households) total.[253]

Cost: $500 million (Revenue bonds and a Rural Utilities Service loan)[254]

Governance: Owned by 11 member towns; private ISPs provide retail services

Services: UTOPIA only provides fiber-to-the home connectivity. Individual households select their ISP as well as services (broadband, video, and voice)

Structures passed: 85,189

Broadband customers in 2018: 21,774

Broadband penetration: 25.6% [255]

UTOPIA, UT

In addition, 10 of the UTOPIA cities (with Payson declining to participate) backed a new $185 million bond issue to repay RUS, cover the shortfall, and retire the original loan. These cities increased their pledge from $202 million to $495 million and extended the pledge period from 20 years to 33 years.[256]

The new financing and restructuring did not solve UTOPIA's problems as it continued to perform poorly. The network had negative cash flow of $22.4 million from 2010 to 2014, and accrued $333.5 million in total liabilities. UTOPIA struggled to meet its loan covenants due to a negative net worth of $167 million and a base of only 11,000 subscribers.[257]

Because UTOPIA was unable to raise any further funding through its own organization, nine of the included cities created a sister organization (the Utah Infrastructure Agency (UIA)) in June 2010 to obtain new financing for building out areas not yet served. Nine cities created this political subdivision of Utah (Brigham, Centerville, Layton, Lindon, Midvale, Murray, Orem, Payson and West Valley). Eight of the member cities (all except Payson) pledged franchise tax revenues as partial loan guarantees in order to secure financing for the network. UIA was able to issue bonds for $29.5 million in 2011, followed by an additional $11.2 million in 2013 and $24.3 million in 2015, for a total of $65 million. UTOPIA has also suffered from cash flow problems, with a negative cash flow of $18.5 million from 2010 to 2014. Its operations, however, turned cash flow positive in 2015 and 2016.[258]

As of 2018, there were 15 member cities of UTOPIA (Brigham, Cedar, Cedar Hills, Centerville, Layton, Lindon, Midvale, Murray, Orem, Payson, Perry, Riverton, Tremonton, Vineyard, and West Valley).[259]

Wilson, NC

The Wilson City Council voted unanimously on November 16, 2006 (with one Council member absent), to finance the construction of a fiber-to-the-home network using Certificates of Participation (COP). These COPs allow the network itself to serve as collateral rather than make taxpayers the guarantors. Wilson issued $15.7 million in COPs in 2007 and $13.5 million in 2008. In total, The City borrowed $33 million to build the system, which became available on a citywide basis in early 2009.[260]

Wilson's fiber-to-the-premise system, named "Greenlight" by the city, provides customers with data, voice, and video services.

Wilson joined Chattnooga, Tennessee, in convincing the former Democratic leadership of the FCC to establish policy in 2015 allowing municipal broadband to grow beyond city borders – despite state law in North Carolina and Tennessee – but the effort was struck down in courts the next year.

In 2019, Greenlight surpassed 10,000 customers, although that represents a low penetration rate in a crowded market. Greenlight was the first service provider in the state to offer Gigabit Fiber-to-the-Home service. Greenlight was recognized by President Obama as one of the nation's fastest broadband networks and Wilson was credited as having "inspired leadership and community mobilization." [261]

Year: 2008 (FTTH)

Population: 49,329[262]

Cost: $33 million ($28 million Certificates of Participation from the City of Wilson; $4.75 million loan from Wells Fargo)

Structures passed: 30,350

Broadband customers in 2018: 9,797 (9,020 residential and 777 commercial)

Broadband penetration: 32.3% [263]

Video and voice customers in 2018: 6,654 video and 3,992 voice; 21.9% and 13.2% penetrations, respectively.[264]

Wilson, NC

But critics have pointed out that Greenlight is plagued by significant financial issues. A nationwide study of municipal broadband networks by the University of Pennsylvania found that the project had a negative cash flow of $2.8 million between 2010 and 2014. The flow turned positive the last two years studied, but report authors Christopher Yoo and Timothy Pfenninger noted that Wilson owes a balloon payment of $6.3 million on the project in 2033, which makes the short-term debt appear smaller on balance sheets.[265]

Yoo and Pfenninger found that unless Greenlight substantially improves its financial performance, it won't be able to cover current operational costs or generate sufficient funds to retire the debt incurred to build the project.

Mike Wendy, then-president of Media Freedom, expressed concern that the city's investment in its broadband network could lead it to attempt to hamstring the growth of 5G in the area. "Innovation like 5G portends more competition for Greenlight, potentially stranding Wilson's taxpayer's investment," Wendy said. "Will Wilson be amenable to help spread such deployment and the prosperity associated with it? Or will its interest in keeping Greenlight afloat interfere with that new innovation? Twenty-nine million in taxpayer-backing and its anti-private sector tactics suggest the answer was answered in 2008." [266]

Conclusion

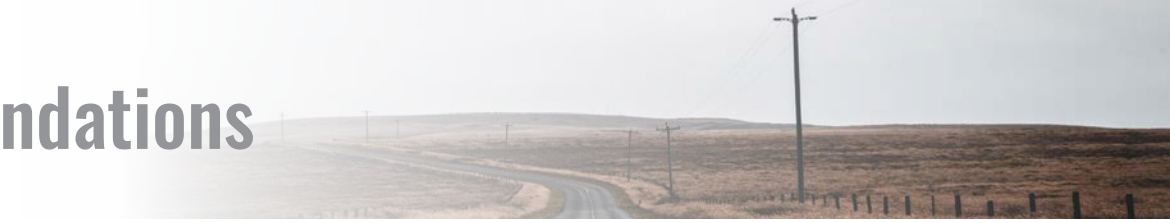
Too many towns, and the millions of taxpayers who live in them, have been lured in by the false promise of inexpensive, fast, and reliable government-owned (taxpayer or ratepayer-funded) internet networks. But until now, city residents and financial experts had little in the way of comprehensive data to counter the "too good to be true" claims of telecommunications consultants. TPA's in-depth database provides broadband penetration rates for 30 GONs, and describes the successes and shortfalls facing these systems.

Other studies, extensively cited throughout our report, have found significant negative financial consequences associated with building out and managing municipal networks across America. For instance, the University of Pennsylvania study on taxpayer broadband liabilities found that it would take taxpayers hundreds of years to pay back the debt incurred by several GONs. TPA's analysis finds that, in addition to these shortfalls, government broadband penetration rates are often disappointingly low. In 2018, (weighted) average broadband penetration across GON was just 36.8 percent, despite rosy predictions offered by consultants of near-universal take-up. Even relatively "successful" GONs carried significant unintended consequences and deterred private entry into internet provision.

The experience of rural Wisconsin broadband provider WiConnect, Inc. is illustrative. Owner Dave Bangert created an innovative business to increase internet access through the use of wireless transmitters mounted on farm silos to provide signals to more than 500 customers in the Reedsburg area of rural Wisconsin. Despite a compelling business model that would not involve hard-earned taxpayer dollars, federal bureaucrats chose to prioritize stimulus dollars for government broadband efforts.

This crowding-out of entrepreneurship is the most significant, disheartening unintended consequence of GON efforts, and policymakers must take private efforts into account along with taxpayer costs. Hopefully, city officials, municipal analysts, and taxpayers across the country can use these datapoints and case studies to carefully consider any future plans for government-owned networks.

Recommendations



To the extent that municipal and state leaders find it necessary to evaluate the current status of broadband in their communities, and potential future projects, the following guidelines are recommended:

●**Utilize timely data:** In recent years, private network providers have deployed gigabit speed broadband service to the vast majority of American households and businesses, while also investing significant capital in expanding service to high-cost rural areas. Some areas that have been deemed "unserved" or "underserved" are in fact served by at least one broadband provider, and often more. Due to the rapid deployment and upgrading of networks, policymakers are advised to seek out the most up to date (less than 12 months old) data on services currently offered or soon to be deployed. Communities should determine the reasons they lack good service and ascertain if there is anything they can do to help facilitate better service without building a costly new network.

●**Eliminate barriers to private-sector broadband:** This report presents examples of GONs that gained an unfair competitive advantage by receiving discounted or subsidized rates for pole attachments. Such action discourages private sector deployment and marketplace competition. Competition can be encouraged by decreasing regulatory impediments on private internet providers, such as by taking quicker action on permits, leveling the playing field for pole attachments, and creating more friendly fee schedules for internet installation projects. Regulatory streamlining can help facilitate more rapid deployment of broadband, better service, and more competition.

●**Ensure consultants are neutral/objective:** As discussed in the report, governments should critically examine the results of their consultants' analyses and recommendations. Just as federal agencies must conduct cost-benefit analyses on proposed rules, local governments should conduct these types of reviews before proceeding with an internet project. If governments do hire a consultant, public officials should also commit to hiring independent consultants to avoid any risk of double dipping by entities that perform feasibility analyses and would also design or manage the project.

●**Utilize private expertise to build networks:** If governments decide to fund network build-out, they should look to partner with a private internet service provider before embarking on a taxpayer-funded project. This report is filled with failed projects, and critics often cite the lack of public sector technical expertise and financial resources as key reasons these networks often do not succeed.

●**Reduce risks of cross-subsidization:** GONs may be subsidized by funds from non-broadband sources, such as excess electric, water, or sewer reserve funds that have accumulated over many years. Ratepayers should demand their electric, water, and sewer rates appropriately reflect the costs associated with those services, and any non-broadband revenues should be used to lower rates for those services.

●**Increase transparency in decision making process:** Local governments often refuse to publicize the business plans and projections of their proposed GONs before committing to the project, hiding behind "proprietary information" exceptions to public records and meetings laws. The public should demand that their elected officials disclose complete analyses and projections so the public can provide appropriate feedback to elected officials about whether the project should proceed and hold officials accountable if they decide to move forward.

Table 1. Broadband Penetration 2009-2018

City, State										
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Bristol, VA										
Brookings, SD	39.8%	39.4%	41.4%	46.1%	48.3%	51.2%	57.2%	60.9%	66.0%	69.4%
Burlington, VT										
Cedar Falls, IA	52.9%	54.2%	58.3%	59.6%	62.0%	63.2%	66.2%	69.1%	70.7%	73.7%
Chattanooga, TN		5.5%	15.9%	21.6%	28.1%	34.9%	41.3%	48.0%	53.0%	57.2%
Clarksville, TN	6.0%	12.1%	17.6%	21.7%	21.0%	25.1%	25.4%	26.0%	27.0%	28.7%
Coldwater, MI					43.5%	42.9%	41.4%	39.0%	38.5%	30.5%
Concord, MA								13.5%	19.1%	24.0%
Crosslake, MN		39.7%	36.8%	43.1%	45.4%	51.2%				51.2%
Greenville, TX	21.8%	22.4%	22.7%	24.4%	26.0%	27.1%	27.9%	29.9%	31.0%	30.9%
Groton, CT	19.5%	20.7%	21.4%	21.3%						21.3%
Harlan, IA							31.0%	31.0%		31.0%
Highland, IL								36.5%	36.8%	41.9%
Independence, OR										
Jackson, TN		25.3%	30.7%	32.3%	33.7%	34.5%	37.0%	38.7%	40.1%	42.1%
Lafayette, LA		16.8%	24.5%	29.2%	31.9%	33.9%	34.0%	36.8%	37.8%	39.0%
Longmont, CO							36.0%	46.1%	52.4%	55.0%
Marshall, MI										19.2%
Monticello, MN							33.3%	35.3%	36.2%	35.7%
Morristown, TN	22.6%	23.7%	24.7%	27.4%	28.9%	30.1%	33.3%	34.4%	35.6%	36.1%
Muscatine, IA	45.7%	46.9%	48.3%	49.6%	50.2%	51.4%	57.7%	60.1%	61.9%	62.6%
Pulaski, TN	22.2%	27.4%	31.1%	34.6%	37.2%	38.8%	40.0%	42.5%	43.5%	37.2%
Reedsburg, WI	33.5%	34.4%	39.8%	43.7%	54.2%	53.8%	55.2%	55.5%	58.5%	62.5%
Salisbury, NC					11.9%	14.5%	16.3%	16.6%	16.4%	16.7%
Sallisaw, OK					35.0%	35.9%	38.9%	42.1%	45.0%	48.0%
Sandy, OR							37.0%	55.2%	65.3%	69.0%
Spencer, IA							32.9%	32.7%	32.4%	32.1%
Tacoma, WA			16.1%	16.7%	17.8%	19.0%	20.5%	20.5%	19.6%	18.8%
UTOPIA, UT			21.3%	26.2%	26.4%	26.2%	24.8%	23.1%	24.1%	25.6%
Wilson, NC	27.2%	18.9%	20.1%	21.0%	22.7%	24.5%	26.2%	28.4%	29.6%	32.3%
AVERAGE	**29.1%**	**27.7%**	**29.4%**	**32.4%**	**34.7%**	**36.6%**	**37.0%**	**38.4%**	**40.9%**	**40.4%**

Table 2. Video Penetration 2009-2018

City, State										
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Bristol, VA										
Brookings, SD		0.6%	6.6%	12.5%	15.8%	16.9%	17.5%	17.7%	17.9%	17.4%
Burlington, VT										
Cedar Falls, IA	57.8%	54.9%	56.5%	55.5%	55.2%	52.6%	51.8%	51.3%	48.8%	46.1%
Chattanooga, TN		5.5%	13.7%	17.9%	22.6%	26.4%	29.4%	32.0%	32.2%	31.4%
Clarksville, TN	4.8%	8.1%	10.4%	11.9%	12.4%	14.6%	11.5%	10.3%	9.2%	8.7%
Coldwater, MI	48.1%	48.7%	50.4%	49.6%	48.5%	47.4%	41.2%	36.3%	32.5%	15.0%
Concord, MA										
Crosslake, MN										
Greenville, TX	35.0%	34.4%	33.8%	33.8%	33.2%	30.7%	28.6%	28.0%	26.9%	23.5%
Groton, CT	32.0%	30.3%	28.7%	27.5%						
Harlan, IA							53.9%	48.2%	47.0%	45.3%
Highland, IL								19.6%	19.6%	21.4%
Independence, OR										
Jackson, TN		48.4%	46.4%	45.7%	45.8%	43.5%	42.0%	41.5%	38.3%	36.4%
Lafayette, LA										
Longmont, CO										
Marshall, MI										
Monticello, MN							16.7%	15.1%	12.3%	10.4%
Morristown, TN	27.5%	26.5%	27.1%	29.5%	29.8%	29.6%	30.3%	28.5%	26.7%	24.4%
Muscatine, IA	61.2%	60.5%	59.0%	58.3%	55.0%	51.0%	51.2%	48.3%	45.7%	42.5%
Pulaski, TN	27.3%	33.1%	34.6%	36.5%	38.4%	38.2%	36.9%	35.7%	33.3%	25.2%
Reedsburg, WI	51.0%	56.2%	55.8%	60.1%	66.2%	41.0%	37.5%	32.9%	31.2%	30.0%
Salisbury, NC					10.5%	11.7%	11.5%	10.1%	9.0%	8.4%
Sallisaw, OK						35.8%	33.6%	33.0%	31.4%	27.9%
Sandy, OR										
Spencer, IA							75.7%	62.5%	60.6%	55.7%
Tacoma, WA			20.8%	20.1%	18.2%	17.2%	16.1%	15.3%	13.9%	12.6%
UTOPIA, UT										
Wilson, NC	28.2%	19.1%	19.8%	19.8%	20.3%	21.1%	21.5%	21.7%	21.3%	21.9%
AVERAGE	**37.3%**	**32.8%**	**33.1%**	**34.2%**	**33.7%**	**31.8%**	**33.7%**	**30.9%**	**29.4%**	**26.5%**

Table 3. Voice Penetration 2009-2018

City, State										
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Bristol, VA										
Brookings, SD	69.4%	62.4%	59.1%	60.5%	61.1%	62.1%	64.3%	66.9%	71.0%	73.3%
Burlington, VT										
Cedar Falls, IA								9.0%	13.5%	15.4%
Chattanooga, TN	3.3%	9.1%	11.7%	14.1%	16.6%	17.7%	18.5%	18.4%	17.9%	17.3%
Clarksville, TN	1.1%	3.8%	4.9%	5.5%	4.9%	5.1%	4.8%	4.4%	3.9%	3.8%
Coldwater, MI					9.2%	9.2%	8.2%	7.9%	7.0%	4.9%
Concord, MA										
Crosslake, MN		75.3%	61.3%	64.1%	60.6%	56.4%				
Greenville, TX										
Groton, CT	4.8%	7.5%	8.9%	8.9%						
Harlan, IA							33.6%	32.4%	31.7%	30.4%
Highland, IL								12.7%	15.9%	17.6%
Independence, OR										
Jackson, TN		17.8%	18.7%	19.1%	19.0%	18.7%	18.3%	17.6%	17.0%	16.3%
Lafayette, LA										
Longmont, CO							5.0%	6.6%	7.4%	7.4%
Marshall, MI										
Monticello, MN							12.1%	14.5%	10.0%	8.8%
Morristown, TN	21.0%	20.3%	20.2%	21.0%	20.9%	20.5%	20.3%	19.1%	17.7%	16.1%
Muscatine, IA										1.5%
Pulaski, TN	18.2%	21.7%	21.8%	22.1%	21.9%	21.0%	19.3%	18.2%	17.4%	14.1%
Reedsburg, WI	48.4%	48.6%	47.9%	47.9%	49.4%	49.1%	47.2%	42.9%	41.9%	40.0%
Salisbury, NC					7.2%	7.7%	7.5%	6.9%	6.3%	5.9%
Sallisaw, OK					25.0%	23.3%	21.7%	20.8%	18.9%	17.7%
Sandy, OR							3.5%	3.4%	5.2%	5.3%
Spencer, IA							61.5%		50.7%	82.6%
Tacoma, WA										
UTOPIA, UT										
Wilson, NC	22.8%	15.5%	15.3%	14.6%	14.5%	14.4%	14.2%	14.0%	13.3%	13.2%
AVERAGE	**23.6%**	**28.2%**	**27.0%**	**27.8%**	**25.8%**	**25.4%**	**22.5%**	**18.6%**	**20.4%**	**20.6%**

Table 4. Broadband Penetration and Size of Population

						<10,000		10,000-19,999		20000-25000		25001-30000		30001-35000		>35001	
City, State	Homes passed	Broadband Penetration Subscribers/ Passings	Population 2019	Subscribers/ Population	Subscribers (2018)	Subscribers	Population	Subscribers	Population	Subscribers	Population	Subscribers	Population	Subscribers	Population	Subscribers	Population
Bristol, VA																	
Brookings, SD	6747	69.4%	24509	19.1%	4683					4683	24509						
Burlington, VT																	
Cedar Falls, IA	19191	73.7%	41048	34.5%	14151											14151	41048
Chattanooga, TN	181885	57.2%	180557	50.0%	90251											90251	180557
Clarksville, TN	69429	28.7%	156794	12.7%	19896											19896	156794
Coldwater, MI	5736	30.5%	12250	14.3%	1751			1751	12250								
Concord, MA	5328	24.0%	20000	6.0%	1207					1207	20000						
Crosslake, MN	2885	51.2%	2213	66.8%	1478	1478	2213										
Greenville, TX	13404	30.9%	28263	14.6%	4137							4137	28263				
Groton, CT	26293	21.3%	40115	13.9%	5592											5592	40115
Harlan, IA	2784	31.0%	5106	16.9%	862	862	5106										
Highland, IL	4724	41.9%	9850	20.1%	1979	1979	9850										
Independence, OR																	
Jackson, TN	35699	42.1%	66903	22.5%	15029											15029	66903
Lafayette, LA	50857	39.0%	126143	15.7%	19809											19809	126143
Longmont, CO	34460	55.0%	96577	19.6%	18947											18947	96577
Marshall, MI	5890	19.2%	7005	16.1%	1130	1130	7005										
Monticello, MN	4341	35.7%	13747	11.3%	1549			1549	13747								
Morristown, TN	14324	36.1%	29926	17.3%	5168							5168	29926				
Muscatine, IA	13931	62.6%	23817	36.6%	8719					8719	23817						
Pulaski, TN	6823	37.2%	7652	33.2%	2541	2541	7652										
Reedsburg, WI	5125	62.5%	9522	33.6%	3204	3204	9522										
Salisbury, NC	19522	16.7%	33834	9.6%	3261									3261	33834		
Sallisaw, OK	4204	45.0%	8450	22.4%	1891	1891	8450										
Sandy, OR	3762	69.0%	11326	22.9%	2597			2597	11326								
Spencer, IA	6230	32.1%	11031	18.1%	2000			2000	11031								
Tacoma, WA	116072	18.8%	216279	10.1%	21825											21825	216279
UTOPIA, UT	85189	25.6%	453000	4.8%	21774											21774	453000
Wilson, NC	30,350	32.3%	49329	19.9%	9797											9797	49329
Sum	775,185		1685246		285228	13085	49798	7897	48354	14609	68326	9305	58189	3261	33834	237071	1426745
AVERAGE		**40.3%**		**21.5%**	**36.8%**	**40.3%**	**26.3%**	**39.3%**	**16.3%**	**56.2%**	**21.4%**	**33.6%**	**16.0%**	**16.7%**	**9.6%**	**36.5%**	**16.6%**

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