

OCTOBER 2015

From

UNDERSTANDING THE DEBATE OVER GOVERNMENT-OWNED BROADBAND NETWORKS:

Context, Lessons Learned, and a Way
Forward for Policymakers

Chattanooga Case Study (updated)

Charles M. Davidson

Director, ACLP at New York Law School

Michael J. Santorelli

Director, ACLP at New York Law School

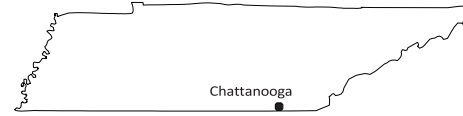


**NEW YORK
LAW SCHOOL**

Updated Case Study of Chattanooga, Tennessee

The city-owned gigabit broadband network in Chattanooga, Tennessee, continues to be offered by pro-GONs advocates as evidence that municipal networks can thrive under the right circumstances.¹ Since its 2010 launch, the city has sought to rebrand and market itself as “the gig city.”² Supporters assert that the network has spurred economic development, is responsible for the launch of a fledgling high-tech sector, and has enhanced the overall quality of life.³ Federal policymakers, including the President, have taken note and have cited Chattanooga as a model that other cities should consider emulating.⁴ Seeking to build on this parade of positive publicity and take advantage of a favorable federal regulatory environment, the regulated public utility that owns and operates the city’s GON took the extraordinary step of petitioning the Federal Communications Commission (“FCC”) to preempt a Tennessee state law that delineates the footprint of the government-owned network.⁵ In early 2015, the FCC agreed to preempt the law at issue, in turn triggering a lawsuit by the state.⁶ The matter is currently pending before a federal appeals court.

Chattanooga, Tennessee At-A-Glance



City Population: 173,778 (2014)

Year of Network Launch: 2010

Current Status: Built

Number of residential subscribers: 65,000

Number of commercial subscribers: 5,500

Number of gigabit connections: <5,500

Revenues: \$99.9 million (2014)

Operating Expenses: \$84.7 million (2014)

Total Cost of Network: ~\$390+ million

Debt Financing & Loans: \$280+ million

Federal Grants: \$111.6 million

Total EPB Debt: \$429.79 million

Total City Debt: \$977.64 million

As discussed in this case study, many aspects of the Chattanooga GON render it very unique, making duplication by other municipalities exceedingly difficult. Moreover, the benefits arising from this very expensive fiber-optic network appear to be less robust upon closer examination, raising the possibility that, over time, the significant costs of building this network might very well outweigh any benefits that it generates.

BACKGROUND

The fiber-optic network that would eventually evolve into Chattanooga’s gigabit GON began to emerge in April 1996, when the board of the city’s regulated electric utility⁷ – the Electric Power Board (EPB) – passed resolutions authorizing construction of a communications network to connect electrical assets (e.g., substations) and the use of \$350,000 to fund the first phase of build-out.⁸

Once deployed, the network was under-utilized for a number of years, leaving the local government and EPB to consider how to put the network to more productive uses.⁹ At that time, numerous legal restrictions limited the types of services and businesses in which a municipal utility could engage vis-à-vis its communications network. In the early 2000s, the state legislature began to amend these laws to allow municipal utilities like EPB to offer non-electric services (including “cable service, two-way video transmission, video programming, [and] Internet services”¹⁰) and make loans between their divisions.¹¹ These amendments spurred plans to commercialize EPB’s fallow communications network. In 2007, the EPB board approved a plan to offer fiber-to-the-home (FTTH) service; in November 2008, the city of Chattanooga granted EPB a franchise for these purposes.¹²

EPB’s entrance into the market for telecommunications and broadband services was met with lawsuits from incumbent ISPs and an array of other organizations. The Tennessee Cable Telecommunications Association, for example, filed suit against EPB claiming that its business plan violated Tennessee state

law.¹³ In particular, the group argued that EPB was illegally cross-subsidizing its communications services with revenue from its electric service.¹⁴ The case was eventually dismissed, and EPB was free to continue with its expansion plans.¹⁵

Recently, EPB has begun exploring opportunities to further expand its fiber-optic network. Indeed, much like a private provider (but with the added benefit of a captive base of electric ratepayers), the utility appears to be looking to generate additional revenues and perhaps achieve greater efficiencies by building out the network, which was initially intended to serve only the city of Chattanooga, into surrounding cities and counties.¹⁶ As of October 2015, these plans are on hold. It is unclear whether this suspension is due to the pending federal judicial review of FCC preemption of the Tennessee state law that long prohibited such expansion.

COST AND FINANCING

The EPB fiber network, which provides commercial broadband service and supports a smart grid system,¹⁷ was financed with a number of intra-utility loans, one-off federal grants, and significant debt. All told, the fiber-optic network has cost approximately \$390 million to deploy.¹⁸

At the outset, EPB Fiber, the division of the utility responsible for building the GON, received a \$50 million loan from EPB Electric during the planning phase of the FTTH network.¹⁹ In 2009, EPB was awarded \$111.6 million in federal stimulus funding from the U.S. Department of Energy in support of its smart grid system.²⁰ To raise additional funds needed to build the fiber-optic network, EPB issued \$229 million of local revenue bonds, which carried an interest rate of 4.5 percent and were rated as AA+ by Fitch.²¹ About 70 percent of this bond issue – \$162 million in all – was used to fund the fiber-optic build-out.²² The local revenue bonds have a 25-year maturity and are due to be paid in full in 2033.²³

These start-up costs have been supplemented numerous times with additional debt and loans. EPB Fiber maintains a \$2.5 million line of credit secured by revenues and assets, which is used for working capital needs.²⁴ The line of credit has an interest rate equal to 30-day LIBOR plus 1.15 percent.²⁵ In March 2011, EPB obtained a bank loan for \$19.5 million over the course of 60 months, guaranteed by the revenues and finances of its communications division.²⁶ The purpose of this loan was to pay off the loan provided by EPB's electric division.²⁷ In August 2012, EPB obtained a \$60 million revolving line of credit to pay the remaining loan balance.²⁸ The line of credit is secured by the assets and revenues from the video and Internet system.²⁹ As of June 30, 2014, the outstanding balance under the revolving line of credit was \$45.9 million.³⁰ In the recent past, EPB has made a number of financial decisions aimed at securing lower interest rates and more favorable financing terms.³¹

In July 2015, Chattanooga issued \$260.1 million of new debt on behalf of EPB – the largest debt in the utility's 76 year history.³² The purpose of this latest issuance is to refund some of the utility's outstanding debt, including Electric System Revenue Bonds from 2006 and 2008, as well as to fund capital improvements to the electricity system.³³ As of June 2014, EPB's total long-term debt stands at \$282.5 million.³⁴ The vast majority of this debt is secured by revenues from the electric system, while only \$4,777,000 is secured by the fiber network itself.³⁵ Whether intended or not, this arrangement obscures the true debt of the fiber system by ascribing the vast majority of total debt used to construct the network – beginning with the initial \$229 million issuance – to the electrical system.

Such financial obfuscation stems from the network's ownership by the EPB, which remains the monopoly electric provider in Chattanooga, where it has over 175,000 electric customers.³⁶ Indeed, the financial and operational relationship between the electric division and the fiber division remains symbiotic, allowing the utility to position its captive electric customers as the financial backstop for the fiber system. For example, in 2012 there was a downgrade of the utility's bond rating.³⁷ The downgrade was due to an "increase in leverage to fund capex in the electric system's smart grid."³⁸ Fitch, the ratings agency, also expressed concern with the use of cross-subsidies (i.e., money from the Fiber division supporting the Electric division) and cost savings (from the smart grid) instead of rate increases to

support future EPB investments.³⁹ In particular, Fitch noted that it was wary of the “variable nature” of these revenue sources.⁴⁰ In July 2015, however, Fitch assigned a more favorable credit rating to EPB, citing stronger performance in the utility’s core electric distribution business; its fiber-optic division was barely mentioned.⁴¹

One unique and important advantage for EPB of such a close relationship between the electric division and its fiber-optic division is that investment in fiber by the utility for the ostensible purpose of bolstering its smart grid can be socialized amongst its captive electric ratepayers (i.e., every resident and business in its service territory). In practice, this means that at least some percentage of the GON is being subsidized by the parent utility.⁴² The benefits flow the other way as well. For example, EPB readily admits that “revenues from [its] Fiber Optics division have allowed the utility to defer rate increases that would have totaled 5 [percent] over the last four years.”⁴³ Nevertheless, EPB recently raised its rates by 3.5 percent for customers to “cover increases in operating costs.”⁴⁴ Whether and how these increased rates might be used for the benefit of the utility’s broadband network remains to be seen.

THE NETWORK

The EPB FTTH network is fully operational and provides broadband for schools, residences, and local businesses.⁴⁵ The service is available to over 170,000 homes, schools, and businesses in the service area, covering 600 square miles.⁴⁶ According to EPB’s most recent annual report, the system served over 58,000 residential customers and 5,200 business customers by the end of 2014.⁴⁷ Recent reports estimate that those numbers have risen to over 65,000 residential customers and about 5,500 commercial customers so far in 2015.⁴⁸ This represents about a 45 percent share of the local residential market for broadband, video, and telephone service.⁴⁹ Despite being available to all potential customers, only about eight percent – or fewer than 5,500 – of residential customers that purchase Internet access subscribe to its signature gigabit service.⁵⁰

An array of service packages is available to residential customers. EPB Fiber offers high-speed Internet, television, and phone, which can be purchased individually or as a bundle. Monthly subscription prices range from \$57.99 for basic, standalone Internet access with speeds of 100 Mbps, to \$190, which includes a gigabit connection (1,000 Mbps), an unlimited phone plan, and a premium television package, as well as enhanced customer service for \$24.95 a month that covers setting up a gigabit-ready router and “ensur[ing] that...devices are running at optimal levels.”⁵¹ As a standalone feature, a gigabit Internet connection is available for \$69.99 per month.⁵²

Notwithstanding questions about its accounting practices and the extent to which the utility might be leveraging its monopoly electric service to support its telecom division, EPB continues to report relatively strong financial health of its fiber system. In 2014, the GON increased its revenues from \$80.7 million to \$99.9 million.⁵³ Revenue from Internet access sales in particular saw a net increase of about \$17 million,⁵⁴ much of which was due to residential customer growth.⁵⁵ Overall, residential services accounted for two-thirds of EPB Fiber’s revenues in 2014.⁵⁶ Expenses and transfers to the city of Chattanooga totaled \$84.7 million.⁵⁷

COMMUNITY IMPACT

The gigabit network in Chattanooga has been the source of considerable attention as debate rages over the extent to which a GON of any kind can have sustainable positive impacts on communities and whether those benefits justify the enormous expense of building such a system. In Chattanooga in particular, some see the FTTH system and the city’s efforts to rebrand itself as a high-tech hub as a reasonable reaction to a long-term decline in the local industrial base.⁵⁸ As such, there is significant enthusiasm around the potential for using the GON to spur economic development, create new jobs, and otherwise enhance quality of life. The following evaluates some of these claims.

Business Environment. The city is using its network – and all the attention it has garnered nationally and internationally – to wage an aggressive campaign in support of high-tech entrepreneurship and encouraging more established firms to relocate to the city.⁵⁹ For example, EPB and city officials highlight that Chattanooga is home to an Amazon.com fulfillment center, which opened in 2011 and supports about 2,700 jobs.⁶⁰ The role of the gigabit network in luring Amazon to Chattanooga, however, remains uncertain. Some argue that the existence of the network likely had little, if any impact, on Amazon’s decision to open a plant in Chattanooga.⁶¹ Indeed, the Chattanooga plant was one of a number of new distribution centers that Amazon opened in 2010 and 2011, including another located in Lebanon, Tennessee, which is not served by EPB.⁶² Moreover, an array of tax breaks played a pivotal role in enticing the company to the area as the city competed with other localities to bring the thousands of low-tech jobs to Chattanooga.⁶³ Similarly, the gigabit network is also often lauded as a primary driver behind convincing Volkswagen to build a plant in the area a few years ago. Recently, the company announced that it planned to expand its plant and add 2,000 manufacturing and engineering jobs with an investment of \$600 million.⁶⁴ The GON’s role in these developments, however, is largely tangential: major drivers of these decisions included significant state tax incentives,⁶⁵ as well as the fact that Tennessee is a right-to-work state.⁶⁶

In the high-tech space, where the city sees its most potential vis-à-vis leveraging its GON for economic development purposes, officials and other stakeholders have consistently observed that the municipality has much work to do when it comes to fostering the kind of environment that is conducive to start-up growth. For example, the city’s Technology, Gig, and Entrepreneurship Task Force issued a report in March 2014 identifying strengths, weaknesses, opportunities, and challenges to fully harnessing the city’s technology assets for economic growth.⁶⁷ Among the challenges identified were the need for “more capital, talent and resources” to drive investment in tech start-ups, the need for “actual practical demonstrations and applications of the digital assets to help people understand” their real world value, and a “lack of diversity among the initial stakeholders” in the city’s nascent start-up community.⁶⁸ There were also significant concerns regarding “digital inclusion” and making sure that stakeholders didn’t overlook the importance of dedicating sufficient resources to closing stubborn digital divides.⁶⁹

Job Growth. In general, no empirical evidence exists to confirm a causal relationship about the positive impact of the FTTH network on jobs in Chattanooga.⁷⁰ The number of new jobs stemming directly from the network appears to be small. Indeed, while there appears to be a good amount of anecdotal data suggesting a surge in the number of start-ups and high-tech businesses leveraging the network, there continues to be a lack of hard data to support these contentions.⁷¹ On the contrary, employment data collected by the Bureau of Labor Statistics shows that job growth in Chattanooga’s information industries, which encompass many of the jobs likely to be created by start-ups and other tech-focused businesses, has been flat over the last few years.⁷² According to recent data, the total number of Chattanooga jobs in these industries has been stuck at just under 3,000 for the last several years after having decreased from a peak of nearly 4,000 in 2009.⁷³ (By way of comparison, information jobs have increased at a steady clip nationally since 2009.⁷⁴) Meanwhile, the city’s unemployment rate has steadily decreased in recent years – the rate in July 2015 was 6.3 percent, down from a peak of 10.2 in June 2009.⁷⁵

Perhaps reflecting dissatisfaction with tepid job growth in these sectors, Chattanooga has invested resources in several initiatives aimed at bolstering the city’s high-tech workforce. For example, in March 2015 the city eagerly joined the federal government’s TechHire initiative, a program aimed at helping to “make it cheaper and faster to gain tech skills and to change the way companies look at, and hire candidates.”⁷⁶ According to one report, more is needed to jolt job creation than just a super-fast GON: “This initiative provides jobs for Chattanoogaans, but also makes the city more desirable for companies looking to relocate. The city says they plan to focus their attention on underrepresented communities to provide them with opportunities to fill these jobs.”⁷⁷ The city also continues to sponsor an annual program – the GigTank – that seeks to answer the question of “what to do with a gig.”⁷⁸ The goal is to not only show off the gigabit network but also to figure out how to use it to grow new businesses in the city.⁷⁹ Interestingly, of this year’s 14 participating firms, only one was local.⁸⁰

Ancillary Benefits. EPB officials also promote its smart grid network as another positive outgrowth of its fiber network. This system, which uses the high-speed communications network to generate, aggregate, and analyze data from an array of sources (e.g., smart meters) about the distribution and consumption of electricity in near real-time, was completed in 2013.⁸¹ Officials have already credited it with helping to save money by preventing widespread power outages. For example, a windstorm in early 2013 brought down power lines that resulted in power outages impacting 3,500 customers; EPB officials believe that number would have been over 8,000 if not for the smart grid.⁸² During a snowstorm in early 2014, the utility credited the smart grid system with “prevent[ing] power outages or automatically restor[ing] electric power to about 40,000 customers, representing more than a 50 per cent reduction in the number of customers who otherwise would have experienced a sustained outage.”⁸³ EPB officials estimate that the smart grid system has helped them enhance reliability and “reduce outages by over 60 percent.”⁸⁴

While these smart-grid outcomes are positive, there is debate as to whether the gigabit GON was actually necessary to achieve these service improvements. The communications requirements of even the most advanced smart grid components are significantly less than 1,000 Mbps.⁸⁵ The smart meters that were installed using the \$111.6 million federal grant, for example, generate a relatively small amount of usage data that, even in the aggregate, do not necessitate a gigabit communications network.⁸⁶ Moreover, the intelligence of these new systems tends to be located either on the utility side or the customer side; the data generated and transmitted across communications networks feed into analytical tools that allow the utility or customer to adjust distribution or consumption patterns.⁸⁷ In addition, even though the communications component of the Chattanooga smart grid might have resulted in cost savings in the short term, the utility will have to continue to invest in maintaining and upgrading the network, as evidenced by recent bond issuances.⁸⁸ Improvements to the smart grid system will undoubtedly have positive impacts on broadband service, providing additional benefits for subscribers – benefits that will be implicitly subsidized by EPB’s electric customers, who recently saw their rates increase by 3.5 percent.⁸⁹

ASSESSMENT

Positioning Chattanooga as a template for other municipalities to use when building a GON is problematic for several reasons.

First, this particular network arose out of unique circumstances. Although the roots of the system stretch back to the late 1990s, momentum around the gigabit GON was greatly bolstered by the economic responses to the Great Recession. The city received a one-time federal grant of \$111.6 million to deploy its smart grid, while actions by the Federal Reserve resulting in historically low interest rates allowed EPB to finance its network (and refinance its debt) in ways that might be difficult for other cities going forward, as interest rates are expected to rise in the near future.⁹⁰

Second, notwithstanding a creative corporate structure for the service, Chattanooga residents are not entirely shielded from liability stemming from the FTTH network. EPB is a nonprofit agency owned by the city of Chattanooga. In theory, this structure allows the utility to take on liabilities without directly exposing the city government or taxpayers to these risks. However, a recent legal case made clear that “EPB and the city of Chattanooga are legally the same identity,” undermining arguments about the two operating under separate and distinct identities for liability purposes.⁹¹ In addition, even though the bonds issued in support of the network are structured to limit taxpayer liability, bondholders have a security interest in EPB’s electrical revenues.⁹² The bonds’ structure is not technically a general obligation, so it has the effect of limiting the ability of creditors to access tax dollars, but it does allow creditors to access revenues stemming from electric ratepayers. In short, if EPB was unable to pay down its debt obligations associated with the FTTH network, it might be forced to raise the rates of its captive electric customers even further.

Third and related, the GON has amassed significant debt, requiring the city to make trade-offs in how it spends limited public dollars. A less publicized community impact of the GON is how much it has contributed to the amount of debt held by the city of Chattanooga. The city government's debt is close to \$1 billion.⁹³ More specifically, the total primary debt is \$977.64 million, about a quarter (\$279 million) of which is interest.⁹⁴ The biggest portion of this debt stems from EPB, whose obligations total \$429.79 million, payable through 2034.⁹⁵

Although some dismiss arguments about heavy debt loads incurred by GONs, rationalizing that they are no different from other long-term monetary obligations assumed by government entities, the decision to invest in a municipal network nevertheless involves important trade-offs.⁹⁶ In short – a dollar spent on a GON, in the form of debt or cash, is a dollar that is not spent on other core government functions. These are especially timely considerations for the state of Tennessee and for Chattanooga: the state faces a “\$6 billion backlog of already-committed” transportation infrastructure projects; of those, seven projects worth \$423.7 million are located in Hamilton County, the seat of which is Chattanooga.⁹⁷ Overall, the state, according to a 2014 report, “needs at least \$38.8 billion of public infrastructure improvements during the five-year period of 2012-2017,” an increase of 3.5 percent in just one year.⁹⁸

Fourth, Chattanooga's long-term economic revival is likely driving many of the economic gains being attributed to the GON. Beginning in the 1980s, the city engaged public and private stakeholders in a comprehensive reassessment of its economy. The result was the creation and use of a series of public-private partnerships aimed at bolstering nearly every aspect of the city, from revitalizing the riverfront to building a world-class aquarium.⁹⁹ By the end of the 1990s, the results of these myriad efforts were impressive: there were clear – and in some cases, dramatic – increases in the number of businesses in the area, wages, jobs, and median household income.¹⁰⁰

ENDNOTES

¹ See, e.g., Christopher Mitchell, *Broadband at the Speed of Light: How Three Communities Built Next-Generation Networks*, at p. 31-60, Institute for Local Self-Reliance (April 2012), <http://www.ilsr.org/wp-content/uploads/2012/04/muni-bb-speed-light.pdf> (“*Broadband at the Speed of Light*”); Edward Wyatt, *Fast Internet is Chattanooga’s New Locomotive*, Feb. 3, 2014, N.Y. Times, <http://www.nytimes.com/2014/02/04/technology/fast-internet-service-speeds-business-development-in-chattanooga.html> (“*Chattanooga’s New Locomotive*”); *Community-Based Broadband Solutions: The Benefits of Competition and Choice for Community Development and High Speed Internet Access*, at 13-14, The Executive Office of the President (Jan. 2015), https://www.whitehouse.gov/sites/default/files/docs/community-based_broadband_report_by_executive_office_of_the_president.pdf.

² See *The Gig City*, <http://www.thegigcity.com/>.

³ See, e.g., Steve Lohr, *Fastest Net Service in U.S. Coming to Chattanooga*, Sept. 12, 2010, N.Y. Times, <http://www.nytimes.com/2010/09/13/technology/13broadband.html?pagewanted=all> (reporting on the city’s plans to use its gigabit network for these and other purposes); Laura Baverman, *Chattanooga’s Gig City Makes Play to be ‘Internet of Things’ Capital*, March 15, 2013, Upstart Business Journal, <http://upstart.bizjournals.com/companies/hatched/2013/03/15/need-bandwidth-come-to-gig-city-and.htm-l?page=all> (reporting on the city’s Gig Tank program to encourage and incubate high-tech startups); Marguerite Reardon, *How Blazing Internet Speeds Helped Chattanooga Shed its Smokestack Past*, Aug. 20, 2015, CNET, <http://www.cnet.com/news/how-blazing-internet-speeds-helped-chattanooga-shed-its-smokestack-past/> (observing that “Chattanooga’s transformation has been decades in the making, but the construction of one of the largest and fastest Internet networks in the Western Hemisphere will be key to helping the city write the next chapter for the 21st century.”); *The 16 Best Places to Live in America: 2015*, Aug. 18, 2015, Outside Magazine, <http://www.outsideonline.com/2006426/americas-best-towns-2015> (ranking Chattanooga as the best place to live in the U.S. and citing to the city’s gigabit GON as why some locals enjoy living there).

⁴ See, e.g., FCC Chairman Tom Wheeler, *Removing Barriers to Competitive Community Broadband*, June 10, 2014, FCC Blog, <https://www.fcc.gov/blog/removing-barriers-competitive-community-broadband> (praising the GON in Chattanooga); Dave Flessner, *Obama Praises Chattanooga as a ‘Tornado of Innovation,’* Jan. 14, 2015, Times Free Press, <http://www.timesfreepress.com/news/local/story/2015/jan/14/obama-says-chattanooga-tornado-innovation/282713/> (same).

⁵ See *In the matter of City of Wilson and the Electric Power Board of Chattanooga*, Memorandum Opinion and Order, FCC 15-25, at 11, (Feb 26, 2015), available at https://apps.fcc.gov/edocs_public/attachmatch/FCC-15-25A1.pdf (“*FCC GONs Preemption Order*”).

⁶ See, e.g., Julian Hattem, *Tennessee Sues Feds For Blocking Web Law*, March 23, 2015, The Hill, <http://thehill.com/policy/technology/236693-tennessee-sues-feds-for-blocking-web-law>.

⁷ The board is comprised of five members appointed by the Mayor, each serving a staggered five-year term. Appointments must be approved by the city council. See *Pre-Filed Rebuttal Testimony and Exhibits of Harold E. DePriest, President and CEO of Electric Power Board of Chattanooga*, at p. 3, Tennessee Regulatory Authority, Docket No. 02-00562 (Dec. 22, 2003), <http://www.tn.gov/tra/orders/2002/0200562ao.pdf>.

⁸ *Broadband at the Speed of Light* at p. 32.

⁹ *Id.*

¹⁰ Tenn. Code Ann. § 7-52-601(a), http://www.lawserver.com/law/state/tennessee/tn-code/tennessee_code_7-52-601.

¹¹ Tenn. Code Ann. § 7-52-603(a)(1)(B), http://www.lawserver.com/law/state/tennessee/tn-code/tennessee_code_7-52-603.

¹² *Broadband at the Speed of Light* at p. 35.

¹³ See *Cable Group Files Suit To Try To Block EPB Fiber Optic Plan*, Sept. 21, 2007, The Chattanooga, <http://www.chattanoogan.com/2007/9/21/113785/Cable-Group-Files-Suit-To-Try-To-Block.aspx>.

¹⁴ *Id.*

¹⁵ See Press Release, *TCTA Lawsuit Against EPB Dismissed*, April 15, 2008, EPB, <https://www.epb.net/news/news-archive/tcta-lawsuit-against-epb-dismissed/>.

¹⁶ See, e.g., *Chattanooga Video Explains Potential Gigabit Expansion Process*, June 29, 2015, Community Broadband Networks, <http://muninetworks.org/content/chattanooga-video-explains-potential-gigabit-expansion-process>.

¹⁷ For an overview of the smart grid system, see EPB Electric Power, Smart Grid, <https://www.epb.net/power/home/products/smart-grid/>.

¹⁸ See Kevin E. McCarthy, *Chattanooga High Speed Broadband Initiative*, Dec. 14, 2012, Research Report 2012-R-0515, Office of Legislative Research, Connecticut General Assembly, <http://www.cga.ct.gov/2012/rpt/2012-R-0515.htm> (“*Chattanooga High Speed Broadband Initiative*”).

¹⁹ *Id.*

-
- ²⁰ *Id.* See also Press Release, *EPB Chattanooga Awarded Federal Stimulus Grant for Smart Grid*, Oct. 28, 2009, EPB, <https://www.epb.net/news/news-archive/epb-chattanooga-awarded-federal-stimulus-grant-for-smart-grid/>.
- ²¹ See, e.g., *Chattanooga High Speed Broadband Initiative*.
- ²² *Id.*
- ²³ *Id.*
- ²⁴ See *Financial Report 2014*, at p. 41, EPB (Sept. 2014), <https://www.epb.net/flash/annual-reports/2014/EPB-Financials-2014.pdf> (“*Financial Report 2014*”).
- ²⁵ *Id.*
- ²⁶ See *Senior Management Report & Financial Information 2012*, at p. 44, EPB (Sept. 2012), <https://www.epb.net/flash/annual-reports/2012/assets/uploads/EPB-Financials.pdf>.
- ²⁷ *Id.*
- ²⁸ See *Senior Management Report & Financial Information 2013*, at p. 53, EPB (Sept. 2013), https://www.epb.net/flash/annual-reports/2013/downloads/EPB_Financials_2013.pdf (“*Senior Management Report & Financial Information 2013*”).
- ²⁹ *Id.*
- ³⁰ *Id.*
- ³¹ *Senior Management Report & Financial Information 2013* at p. 43.
- ³² See Dave Flessner, *EPB builds biggest and fastest telecom service*, July 23, 2015, Times Free Press, <http://www.timesfreepress.com/news/business/aroundregion/story/2015/jul/23/epb-builds-biggest-and-fastest-telecom-servic/316012/>.
- ³³ See *Electric System Refunding Revenue Bonds, Series 2015A, City of Chattanooga Tennessee*, at p. 1, Electronic Municipal Market Access, Municipal Securities Rulemaking Board (2008), <http://emma.msrb.org/EA731625-EA573577-EA969438.pdf> (“*Electric System Refunding Revenue Bonds, Series 2015A, City of Chattanooga Tennessee*”).
- ³⁴ *Financial Report 2014* at p. 39.
- ³⁵ *Id.* This debt stands in the form of a 2014 promissory note, bearing an interest rate of LIBOR plus 1.12% (1.27% as of June 2014).
- ³⁶ *Id.* at 10.
- ³⁷ See, e.g., Bhala Mehendale, *Fitch Downgrades Chattanooga Electric Power Board, TN Electric System Revs to ‘AA’*, March 7, 2012, Fitch Ratings, <http://mobile.reuters.com/article/companyNewsAndPR/idUS241871+07-Mar-2012+BW20120307> (“*Fitch Downgrades Chattanooga Electric Power Board*”).
- ³⁸ *Id.*
- ³⁹ *Id.*
- ⁴⁰ *Id.*
- ⁴¹ See *Fitch Rates Chattanooga's EPB's (TN) Electric System Revs ‘AA+’*, July 7, 2015, Reuters, <http://www.reuters.com/article/2015/07/07/ny-fitch-ratings-tn-idUSnBw076553a+100+BSW20150707>.
- ⁴² See, e.g., George Ford, *Why Chattanooga is not the “Poster Child” for Municipal Broadband*, at 2, Phoenix Center Perspectives 15-01, Phoenix Center for Advanced Legal & Economic Public Policy Studies (Jan. 2015), <http://www.phoenix-center.org/perspectives/Perspective15-01Final.pdf> (highlighting this dynamic).
- ⁴³ See Press Release, *EPB Asks Board for Electric Rate Increase*, May 22, 2015, EPB, https://www.epb.net/media-relations/news/news_archive/epb-asks-board-for-electric-rate-increase/.
- ⁴⁴ See Press Release, *EPB Board Approves Electric Rate Increase*, June 26, 2015, EPB, https://www.epb.net/media-relations/news/news_archive/epb-board-approves-electric-rate-increase/ (“*EPB Board Approves Electric Rate Increase*”).
- ⁴⁵ The construction timeline was projected to extend over 30 months. See Karl Pfeil & Jason Clark, *Fitch Rates Chattanooga Electric Power Board’s \$215MM 2008 Utility Revs ‘AA’*, Feb. 13, 2008, Fitch Ratings, http://www.fitchratings.com/creditdesk/press_releases/detail.cfm?pr_id=405532.
- ⁴⁶ See *Popular Annual Financial Report for the Year Ended June 30, 2012*, at p. 8, City of Chattanooga Finance & Administration Department, http://www.chattanooga.gov/images/finance_files/FY12_PAFR_updated.pdf.
- ⁴⁷ *Financial Report 2014* at p. 8.

⁴⁸ See Dave Flessner, *EPB readies \$250 million bond issue with upgraded rating*, July 9, 2015, Times Free Press, <http://www.timesfreepress.com/news/business/aroundregion/story/2015/jul/09/epb-readies-250-million-bond-issue-upgraded-rati/313639/> (“EPB readies \$250 million bond”).

⁴⁹ See Mitra Malek, *High Fiber Choice: EPB Attracts 45 percent of Homes with Telecom Services*, March 22, 2015, Times Free Press, <http://www.timesfreepress.com/news/business/aroundregion/story/2015/mar/22/high-fiber-choiceepb-attracts-45-percent-home/294234/>.

⁵⁰ *Id.*

⁵¹ See EPB Fiber Optics, Packages—Custom Bundle, <https://epbfi.com/enroll/packages/>.

⁵² *Id.*

⁵³ *Financial Report 2014* at 13.

⁵⁴ *Id.*

⁵⁵ *Id.*

⁵⁶ *Id.* at 14 (an increase of 2 percent from last year).

⁵⁷ *Id.* at 13.

⁵⁸ See, e.g., The Gig City, About, <http://www.thegigtank.com/gig-city> (“The Gig City is a city of pioneers. Chattanooga has a rich legacy of entrepreneurs—from startups that grew into industry game-changers to civic leaders who changed Chattanooga from the “dirtiest city in America” into Outside Magazine’s “best town ever.”); Tod Newcombe, *Chattanooga’s Internet Rise*, Jan. 22, 2013, Governing.com, <http://www.governing.com/columns/Chattanoogas-Internet-Service-Is-No-Choo-Choo.html>; Bruce Katz, *An Innovation District Grows in Chattanooga*, Sept. 29, 2015, The Avenue Blog, Brookings, <http://www.brookings.edu/blogs/the-avenue/posts/2015/09/29-innovation-district-chattanooga-katz> (describing EPB as the “catalyst” of Chattanooga’s economic revival).

⁵⁹ See, e.g., Sarah Rich, *Chattanooga’s ‘Gig Tank’ Results in Real-Time Translator and Research Sharing Apps*, Sept. 11, 2012, Government Technology, <http://www.govtech.com/e-government/Chattanoogas-Gig-Tank.html> (reporting on the city’s Gig Tank initiative, which was described by officials as “part startup accelerator, part think tank and part contest” for entrepreneurs and students to spend the summer in Chattanooga and develop ideas for applications based on the gigabit per second broadband access available in the city.”). See also Bento J. Lobo, *The Realized Value of Fiber Infrastructure in Hamilton County, Tennessee*, A Study Commissioned by EPB (June 2015), <http://ftpcontent2.worldnow.com/wrcb/pdf/091515EPBFiberStudy.pdf> (attempting to estimate the “incremental and social benefits” arising from the GON in Chattanooga) (“Realized Value”).

⁶⁰ See, e.g., Mike Pare, *President Obama Tours Amazon in Chattanooga as Officials Prepare to Increase Workforce*, July 31, 2013, Times Free Press, <http://www.timesfreepress.com/news/2013/jul/31/president-obama-tours-amazon-chattanooga-officials>.

⁶¹ Indeed, after a tour of the facility in July 2013, President Obama did not even mention the gigabit network in remarks to the company. For a transcript of his remarks, see *President Obama’s Speech at Amazon in Chattanooga*, July 30, 2013, Times Free Press, <http://www.timesfreepress.com/news/2013/jul/30/prepared-transcript-president-obamas-speech-amazon>.

⁶² See, e.g., Mike Pare, *Chattanooga Area Amazon Sites Fit Bigger Plan*, Jan. 30, 2011, Times Free Press, <http://www.timesfreepress.com/news/2011/jan/30/amazon-sites-fit-bigger-plan>.

⁶³ See, e.g., Cheri Burt, *UPDATE: Hamilton County Commission approves tax breaks for Amazon.com*, Dec. 1, 2010, WRCBT.com, <http://www.wrcbtv.com/story/13594831/hamilton-county-commission-approves-tax-breaks-for-amazoncom>.

⁶⁴ See *2015 Gold & Silver Shovel Awards: Texas, Georgia, Tennessee, South Carolina and Nevada Awarded Gold Shovels*, Area Development Special Presentation (Q2 2015), <http://www.areadevelopment.com/Gold-Shovel-Econdev-Awards/Q2-2015/TX-GA-TN-SC-NV-Gold-Shovel-44405151.shtml>.

⁶⁵ See, e.g., Robin Micheli, *Rebooting Chattanooga’s Fortunes*, Nov. 18, 2013, CNBS, <http://www.cnbc.com/2013/11/18/hattanoogas-fortunes.html> (attributing major economic development successes like the Volkswagen plant to the availability of such incentives).

⁶⁶ See National Right to Work Legal Defense Foundation, Tennessee, <http://www.nrtw.org/right-work-states-tennessee>.

⁶⁷ See *Chattanooga Forward, Technology, Gig, and Entrepreneurship Task Force Report*, Chattanooga, TN (March 2014), http://www.chattanooga.gov/images/Mayor/Images/Chattanooga_Forum_Working_report.pdf.

⁶⁸ *Id.* at 6.

⁶⁹ *Id.* at 10.

⁷⁰ See, e.g., *Chattanooga High Speed Broadband Initiative*.

⁷¹ There have been attempts to link the GON to job growth by estimating that a certain percentage of new investment and new jobs stem from the presence of a municipal fiber network. See, e.g., Realized Value. This methodology, however, is admittedly faulty owing to the fact that “no holistic theory exists to capture the impact of broadband access to the internet.” *Id.* at 13. Consequently, these kinds of analyses tend to be characterized by “ad hoc-ism” that rely on the use of “counterfactuals” instead of hard data. *Id.*

⁷² For further elaboration on this analysis, see Charles M. Davidson & Michael J. Santorelli, *Understanding the Debate over Government-Owned Broadband Networks: Context, Lessons Learned, and a Way Forward for Policy Makers*, at p. 98, ACLP at New York Law School (June 2014), <http://www.nyls.edu/advanced-communications-law-and-policy-institute/wp-content/uploads/sites/169/2013/08/ACLP-Government-Owned-Broadband-Networks-FINAL-June-2014.pdf> (“ACLP 2014 GONs Report”).

⁷³ BLS data regarding information sector jobs for Chattanooga, TN, for the period of 2005-2015 (not seasonally adjusted). Data on file with the authors.

⁷⁴ BLS data regarding national information sector jobs for the period of 2005-2015 (not seasonally adjusted). Data on file with the authors.

⁷⁵ BLS data regarding the unemployment rate in the Chattanooga, TN, metropolitan statistical area for the period of 2005-2015 (not seasonally adjusted). Data on file with the authors.

⁷⁶ See *TechHire Initiative coming to Chattanooga to provide training for high-tech jobs*, March 9, 2015, WRCB-TV, <http://www.wrcbtv.com/story/28328885/techhire-initiative-coming-to-chattanooga-to-provide-training-for-high-tech-jobs>.

⁷⁷ *Id.*

⁷⁸ See Mitra Malek, *Chattanooga Startup Event Leverages Gig-Speed Internet*, May 12, 2015, Gov Tech, <http://www.govtech.com/dc/articles/Chattanooga-Startup-Event-Leverages-Gig-Speed-Internet.html>.

⁷⁹ *Id.*

⁸⁰ *Id.*

⁸¹ *Broadband at the Speed of Light* at p. 46.

⁸² See *EPB Says Smart Grid Paying Off Handsomely For Customers*, Jan. 18, 2013, The Chattanooga, <http://www.chattanoogan.com/2013/1/18/242501/EPB-Says-Smart-Grid-Paying-Off.aspx>.

⁸³ See Rose Bundock, *How Chattanooga's Self-Healing Smart Grid is Cutting Outages, Saving Money*, June 20, 2014, Metering & Smart Energy International, <http://www.metering.com/how-chattanoogas-self-healing-smart-grid-is-paying-off/>.

⁸⁴ *Id.*

⁸⁵ See, e.g., Mari Silbey, *Chattanooga Powers Smart Grid with Gigabit Network*, May 1, 2012, Smart Planet, <http://www.smartplanet.com/blog/thinking-tech/chattanooga-powers-smart-grid-with-a-gigabit-network/11464> (observing that “Many smart grid applications don’t need the power of fiber. Meter reading, for example, doesn’t require the communications network speed that streaming video does.”).

⁸⁶ See, e.g., *Communications Requirements of Smart Grid Technologies*, U.S. Department of Energy (Oct. 2010), http://www.gc.energy.gov/documents/Smart_Grid_Communications_Requirements_Report_10-05-2010.pdf (detailing the various kinds of technologies that will comprise the smart grid and assessing their individual communications needs).

⁸⁷ See, e.g., Kristen Korosec, *Using Big Data to Give the Smart Grid a Brain*, Oct. 29, 2012, Smart Planet, <http://www.smartplanet.com/blog/bulletin/using-big-data-to-give-the-smart-grid-a-brain/4072>.

⁸⁸ EPB’s track record on this point – i.e., its inability to effectively leverage the communications network it ostensibly built for these purposes in the 1990s – is not encouraging. Moreover, energy utilities generally have a poor track record when it comes to embracing technological innovation. See, e.g., Charles M. Davidson & Michael J. Santorelli, *Realizing the Smart Grid Imperative: A Framework for Enhancing Collaboration Between Energy Utilities & Broadband Service Providers*, Time Warner Cable Research Program on Digital Communications (2011), http://www.nyls.edu/advanced-communications-law-and-policy-institute/wp-content/uploads/sites/169/2013/08/TWC_Davidson.pdf.

⁸⁹ *EPB Board Approves Electric Rate Increase*

⁹⁰ See, e.g., Mary Williams Walsh, *Cost of Public Projects is Rising, and Pain will be Felt for Years*, June 26, 2013, N.Y. Times, <http://dealbook.nytimes.com/2013/06/26/bill-for-public-projects-is-rising-and-pain-will-be-felt-for-years> (describing unfavorable conditions that will negatively impact the ability of municipalities to borrow in support of public projects); Andrew Soergel, *Could Higher Interest Rates Drive up Road Construction Costs?*, March 17, 2015, U.S. News & World Report, <http://www.usnews.com/news/articles/2015/03/17/higher-interest-rates-could-make-fixing-americas-infrastructure-more-expensive> (“The Fed lowered rates in 2008 to stimulate economic activity. Low interest rates make short-term loans and

capital costs less expensive and can stimulate economic growth. Once the rates go up, it could become more expensive to invest in the sizable infrastructure updates that the American Society of Civil Engineers says the country desperately needs.”).

⁹¹ See Dave Flessner, *Judge Dismisses Lawsuit Against EPB Over Streetlight Charges*, Sept. 11, 2015, Times Free Press, <http://www.timesfreepress.com/news/business/aroundregion/story/2015/sep/11/judge-dismisses-lawsuit-against-epb-over-streetlight-charges/324675/>. For additional background, see Dave Flessner, *Who Owns EPB? Judge Hears Arguments, Promises to Decide Legal Dispute*, Aug. 25, 2015, Times Free Press, <http://www.timesfreepress.com/news/business/aroundregion/story/2015/aug/25/who-owns-epb-judge-hears-arguments-and-hopes/321534/>.

⁹² See *Electric System Revenue Bonds, Series 2008A, City of Chattanooga Tennessee*, at p. 1, Electronic Municipal Market Access, Municipal Securities Rulemaking Board (2008), <http://emma.msrb.org/MS270152-MS266407-MD521993.pdf>.

⁹³ See David Tulis, *City's Debt Approaches \$1 Billion*, July 31, 2015, The Chattanooga, <http://www.chattanooga.com/2015/4/14/298217/Citys-Debt-Approaches-1-Billion.aspx>.

⁹⁴ *Id.*

⁹⁵ *Id.*

⁹⁶ See, e.g., *ACLP 2014 GONs Report* at p. 101-102.

⁹⁷ See Andy Sher, *Chattanooga Area Lawmakers Say Gas Tax Hike Not Going Anywhere*, May 28, 2015, Times Free Press, <http://www.timesfreepress.com/news/politics/state/story/2015/may/28/local-lawmakers-say-gtax-hike-not-going-anywh/306606/>.

⁹⁸ See *Tennessee's Infrastructure Needs Stand at \$38.8 billion*, Oct. 25, 2014, The Chattanooga, <http://www.chattanooga.com/2014/10/25/287114/Tennessee-s-Infrastructure-Needs-Stand.aspx>.

⁹⁹ For an overview of these myriad efforts, see generally David Eichenthal and Tracy Windeknecht, *Chattanooga, Tennessee: A Restoring Prosperity Case Study*, Metropolitan Policy Program at Brookings (Sept. 2008), http://www.brookings.edu/~media/research/files/papers/2008/9/17%20chattanooga%20eichenthal%20windeknecht/200809_chattanooga.pdf.

¹⁰⁰ *Id.* at p. 19.