

**ACLP's "A CLOSER LOOK"**

*Comprehensive assessments of models, "successes," and other examples cited in support of proposals for municipal broadband networks.*

**A CLOSER LOOK: BERKMAN'S MUNICIPAL FIBER PRICING STUDY**  
**JANUARY 2018**

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**1. INTRODUCTION**

A recent report issued by Harvard's Berkman Klein Center, [\*Community-Owned Fiber Networks: Value Leaders in America\*](#), attempts to further the cause of municipal broadband by positing that, in various of the instances examined, and within the parameters of the study, government-owned broadband networks (GONs) providing fiber-to-the-home service (FTTH) offer lower prices for standalone broadband than the private ISPs with which they compete.<sup>1</sup> Even though the report itself notes that the analysis is "inherently incomplete" owing to "lack of standardization of Internet service offerings" and other challenges in data gathering, the report nevertheless asserts that its findings are "compelling" vis-à-vis the status of "broadband pricing, competition, and adoption" in the U.S.<sup>2</sup>

Notwithstanding such admissions that the data and analysis are lacking,<sup>3</sup> and notwithstanding other problematic methodological and analytical aspects discussed herein, the Berkman report has received a fair amount of positive press coverage since release, with many seizing on the core assertion of the report (*i.e.*, that some municipal broadband systems appear to out-perform private ISPs on price) in an effort to bolster continued pro-GONs advocacy.<sup>4</sup> Indeed, the study has even been

**TAKEAWAYS AT-A-GLANCE**

**1. INTRODUCTION (P. 1)**

- Study seeks to further narrative about inadequacies of private broadband in U.S. A closer look, though, reveals critical flaws and omissions that undermine its findings

**2. METHODOLOGICAL FLAWS (P. 2)**

- Report data yields a startling result: while the GONs examined indicate an average of 22% lower entry prices, private alternatives are 43% faster (§2.1)
- Report ignores both the indirect costs and financial risks associated with GONs (§2.2)
- Report excludes pricing data from major private providers; reasons why are not compelling (§2.3)
- Report ignores key market conditions (§2.4)
- Exclusion of bundled services makes little sense and undermines the findings (§2.5)

**3. OMITTED DETAILS (P. 4)**

- Price of broadband is neither the primary influencer of adoption decisions nor a leading indicator of the quality of service offered (§3.1)
- Nearly all of the GONs in the report are owned by muni utilities; such systems convey a number of unique advantages (§3.2)
- Most of the GONs in the study are not yet fully deployed (§3.3)
- Several of the systems in the study have failed or are struggling (§3.4)
- Many of the GONs studied differ in subtle but important ways (§3.5)

cited as an impetus for a new Congressional bill that seeks to “empower local communities to ensure their residents have broadband access by preserving the right to provide community-owned service to consumers.”<sup>5</sup>

This general narrative being advanced, that broadband provided by incumbent ISPs in the U.S. is somehow lacking, is not new, nor is an incomplete focus on pricing (indeed, one of the authors of the Berkman report co-authored a similar study in 2014).<sup>6</sup> Many of these price-related inquiries are similar in that none are truly comprehensive – and many are fundamentally flawed. For example, studies comparing average broadband speeds and prices in the U.S. with those in other countries typically fail to drill beneath the surface (and those that do actually reveal how profoundly different the U.S. is from its international counterparts in a number of important respects<sup>7</sup>). Unfortunately, many of these studies tend to rely on superficial comparisons based on faulty, incomplete, or anecdotal data. Yet the details matter. In the international comparisons, for example, key differences in population densities, regulatory frameworks, and provider performance are rarely mentioned despite their direct impacts on markets, competition, deployment costs, and how services are priced.<sup>8</sup>

A similar dynamic is at work in the Berkman study. As discussed in Section 2, the methodology used in the report is problematic – much more so than the authors admit. Moreover, as detailed in Section 3, the report omits critical details about the underlying conditions influencing the GON prices studied. The authors attempt to brush these failings aside as they call on private ISPs to be more forthcoming about their terms and conditions of service.<sup>9</sup> This is pure deflection. The surface-level findings in the Berkman report should not be viewed as dispositive vis-à-vis municipal broadband offering “better” service than private broadband. Accordingly, policymakers should view the report’s findings as flawed (the authors admit as much) and endeavor instead to ask hard questions about its methodology and other aspects of the analysis. Doing so reveals a number of key shortcomings that undermine the report’s takeaways.

## **2. CRITICAL METHODOLOGICAL FLAWS UNDERMINE THE BERKMAN REPORT’S CORE FINDINGS & CONCLUSIONS**

The Berkman report goes to great lengths to frame GONs as “value leaders in America” vis-à-vis broadband pricing. However, serious methodological oversights and poorly representative data undermine this conclusion. Even so, the report brazenly asserts that GONs “may help close the “digital divide” by providing broadband at prices more Americans can afford.”<sup>10</sup> The following illustrates why this conclusion is not just tenuous, but invalid.

### **2.1 The Report’s Attempted Within-Market Paired Comparisons Fail on Many Fronts and Ultimately Yield Contradictory Conclusions**

The costs of providing broadband service are dependent on a variety of locational factors, from the logistical difficulties of deploying and maintaining a network (*e.g.*, geographical challenges that might raise the costs of deployment) to demographic factors that influence consumer demand for services. The report attempts to control for these factors by looking just at differences in the prices for standalone broadband service offered by a GON and its private ISP competitors. Unfortunately, markets like these are relatively rare, as evidenced by the very small sample size: only 27 markets were examined in a nation of tens of thousands of municipalities.

Further compounding these shortcomings is the imprecise means by which services are compared. Most glaringly, the report does not actually look at equivalent services between public and private providers. This leads to a simple fact that contradicts the findings of the study:

- *Using the data relied upon in the study for the markets where a GON “out-priced” private options, the average savings to consumers is approximately 22%.<sup>11</sup> But that same data reveals that the private ISPs in those markets provide 43% faster download speeds on average.<sup>12</sup>*
- *Excluding data for the two GONs that have since been privatized (in Bristol, VA, and Crosslake, MN; see Section 3 for details) further exacerbates this split: the average savings are essentially the same, but the average download speeds offered by private ISPs increases to 45% higher than those offered by GONs.<sup>13</sup>*

In other words: all the report demonstrates is that slower services are cheaper; any implied savings are without mathematical basis.

Also of note is that, when discussing how they accounted for one-time and recurring costs outside of the actual monthly service charge, the authors offer only vague explanations for how these factors were calculated. For example, in cases where ISPs allowed users to purchase their own equipment from 3<sup>rd</sup>-parties (such as modems and routers), the authors coded such purchase as “not applicable” and “recorded the cost of the optional equipment in the survey notes.”<sup>14</sup> They are unclear if these noted costs were included in the aggregate four-year costs (even a modest modem and router can cost over \$100, which can significantly change the price savings in a market).

## **2.2 The Report Ignores Both the Indirect Costs and Financial Risks Associated with GONs**

The survey looks solely at service charges, which can be an accurate method for analyzing the cost of private services but one that is incredibly limited in elucidating the actual cost of public broadband. Unlike private services, which internalize risks and pass costs onto consumers primarily in the form of service charges, GONs in many instances pass substantial financial risk onto residents because the local government is involved in some manner in financing the network. Negative financial eventualities (*e.g.*, low take-rates, high debt burdens, missed debt payments) can hurt residents, even those that don’t subscribe to the service as a local government can levy additional costs on residents indirectly in a variety of forms, from increases in overall taxes, to cost increases for other local services, to cuts in other services owing to the opportunity costs that attend the pursuit of a GON.<sup>15</sup> (For further discussion on these points, see Section 3.)

## **2.3 The Report Excludes Critical Pricing Data from Other Broadband Providers**

The report excludes pricing data related to the offerings in relevant local markets by AT&T, Verizon, and Time Warner Cable/ Charter. Such an exclusion is rationalized as unfortunate but necessary given the “restrictive” nature of the Terms of Service (TOS) on these companies’ websites.<sup>16</sup> Legal concerns aside, this choice by the authors excludes approximately 60% of the broadband market at the time the data was collected, which severely reduces the validity and generalizability of its conclusions. Unlike a random sample, which attempts to collect a small but representative set of data, this selective approach provides a sequestered view of pricing in the market. Moreover, the TOS restrictions on data collection at issue are not unusual and tend to target large-scale data aggregation rather than the efforts of an individual looking to gather insights into pricing in a particular market. Such a literal interpretation of the TOS would mean that a family looking to relocate, for example, would not be allowed to compare how much they would pay for broadband in their new hometown.

## **2.4 By Looking Only at Markets With Both Public and Private Providers, The Report Unduly Ignores Large-Scale Market Conditions**

Putting aside the contradictory findings noted in Section 2.1, there are many likely explanations for the perceived greater efficiency of the GONs studied. For one, GONs must offer cheaper services to attract customers away from incumbents (see Section 3 for additional discussion). More importantly, the rarity of GONs implies a degree of self-selection. The fact that so few exist suggests that those that do are taking advantage of “favorable” market conditions that allow them to compete with private providers (yet, as noted below and elsewhere, such assessments of local market conditions tend to be overly optimistic<sup>17</sup>). The thousands of markets without a public broadband provider strongly suggest that GONs writ large lack the ability to deliver affordable services or otherwise compete on a level playing field with private ISPs in a sustainable manner.

## **2.5 The Report Excludes Bundled Services From its Analysis, A Key Pricing Mechanism for Private ISPs and an Important Point of Competition in the Modern Broadband Market**

The authors intentionally omit the consideration of bundled service discounts “because the complexity of these offerings makes direct comparisons difficult, if not impossible.”<sup>18</sup> While they proceed to make indirect comparisons, this omission means that a key pricing and profit mechanism for private providers is ignored altogether. Private providers tend to be more intimately tied to the other services they offer, which is not surprising given how the market has evolved (*i.e.*, from standalone “basic” services like telephony and television to more “advanced” bundles of services like video, VoIP, and broadband). GONs, on the other hand, tend to focus more on their broadband offerings, viewing video and voice as ancillary services (as noted below, some GONs do not even offer video).<sup>19</sup> The authors attempt to legitimate this omission by citing the recent trend of “cord-cutting.” But, as noted in the Berkman report, only a small share of consumers engages in such behavior, with the vast majority opting to supplement their cable packages with streaming options.<sup>20</sup> In short, bundled services continue to play an important role in influencing subscription decisions in the advanced communications space.

## **3. ESSENTIAL DETAILS REGARDING GON PRICING WERE OMITTED FROM THE BERKMAN REPORT**

Beyond glaring methodological errors, the Berkman report also omits critical details about the conditions influencing the GON prices studied – details that further undermine the study’s conclusions.

### **3.1 Price Tells Only a Small Part of the Connectivity Story**

The study’s focus on price is misleading in that it implies that the cost of broadband is both a primary influencer of a customer’s willingness to subscribe and a leading indicator of the quality of service offered. In the real world, neither tends to be the case.

- *With regard to the impact of price on consumer demand* – many factors influence whether a customer opts to switch from one ISP to another. The fact that none of the GONs offering “cheaper” services dominate their local market demonstrates that price alone is not the primary determinant of demand. To the contrary, bundled services, which are eschewed in the Berkman analysis, tend to offer consumers more value than a standalone offering.

For non-adopters, price is a factor, but not *the* factor, in adoption decisions, particularly when paired with perceptions that broadband is not a worthwhile investment. NTIA has found that most people remain unconnected because they are not interested in broadband.<sup>21</sup> Indeed, a significant number of non-adopters will not subscribe to broadband even at a price of zero.<sup>22</sup> Lack of digital literacy skills plays a major role in adoption decisions, as does a lack of computing device.<sup>23</sup>

- *With regard to price as a proxy for quality* – this is a simplistic argument that seems to be a crude means of furthering the narrative that FTTH GONs are the optimal path forward in the broadband space. The report offers low prices as yet another reason why such systems ought to be attractive in cities. But as discussed below, the pricing associated with these services is too scattershot to be grounded in reality.

### **3.2 Nearly All of the Systems Studied Are Maintained by Muni Electric Utilities, Providing the GONs with Several Important Advantages**

Twenty-one (21) of the 24 systems that outperformed private ISPs on price were deployed by municipal electric utilities. This crucial fact, which is omitted entirely from the analysis, matters because GONs deployed in this manner have a number of advantages that tilt the playing field in a manner that enables them to offer lower retail prices.<sup>24</sup> These include:

- An ability to tap into cross-subsidies from a bottomless well of revenues derived from a captive electric customer base in the form of loans, inter-fund transfers, etc.<sup>25</sup> This occurs with many of the muni utilities included in the Berkman study, including in Bristol, VA (which has since failed)<sup>26</sup>; Chattanooga, TN<sup>27</sup>; Longmont, CO<sup>28</sup>; and Clarksville, TN.<sup>29</sup>
- Lower deployment costs thanks to discounted or free access to the local rights-of-way (*e.g.*, poles) owned by the utility or city (this is why many of these systems are deployed aerially rather than underground).<sup>30</sup>
- In the cities that use their municipal network to pursue a “smart grid” (*e.g.*, Chattanooga, TN; Concord, MA; Opelika, AL), utilities can ascribe investments in fiber (*e.g.*, new debt, maintenance costs) to the electric division rather than the broadband division, obscuring the true cost – and profitability – of the GON.<sup>31</sup>

### **3.3 Most of the GONs Studied Are Not Fully Built Out, A Fact that Impacts Pricing Decisions in Several Important and Unacknowledged Ways**

Data from BroadbandNow.com shows that many of the GONs that outperformed private ISPs on price have yet to be completed. Indeed, only a few (including Chattanooga, TN; Brookings, SD; Dalton, GA; and Sandy, OR) are fully deployed at this time. Most others have considerably smaller service footprints than their private counterparts, who, by virtue of video franchise obligations, are required to deploy to far larger areas without regard to consumer demand or actual take-rates. The much-vaunted GON in Longmont, for example, is only available to about half of the city’s residents.<sup>32</sup>

This fact impacts pricing decisions in a number of ways. As noted above, a city could be underpricing its offerings in order to gain market share. Such could be the case in cities that don’t view their GON as something that has to be profitable, a strain of argument that is increasingly popular

in framings of municipal broadband systems as public utilities that deliver benefits “beyond the balance sheet.”<sup>33</sup> Over the long-term, prices could increase in other cities as deployment costs go up. Such would square with the general trend in the muni broadband space vis-à-vis the difficulty that munis have when it comes to pricing their offerings:

- In some instances, GON prices are set via demand surveys that ask customers about the price at which they switch to the public offering. These surveys tend to overestimate demand and have led some systems, including the one in Monticello, MN, which is cited in the Berkman report, to struggle mightily (see below).
- In other cases, GONs set their prices to match the “standard” price for a gig, which was initially (and artificially) set by Google Fiber in Kansas City and then replicated in Chattanooga.<sup>34</sup> Some of the GONs in the Berkman study charge less than \$100/month for a gig, while others charge well over that price. Such inconsistency suggests that GON pricing is largely untethered from reality. Whether these prices are viable over the long-term remains to be seen.

### **3.4 Several of the Systems in the Report Have Failed or Are Struggling**

A number of the systems that were found to outperform private ISPs on price have proven to be unsustainable over the long term. These include, for example:

- *Bristol, VA* – this GON has failed and is being sold off to a private company.<sup>35</sup>
- *Crosslake, MN* – this GON failed and was sold off to a consortium of private companies in 2016.<sup>36</sup>
- *Monticello, MN* – as previously noted, this GON has struggled mightily.<sup>37</sup> It has defaulted on its debt in the past and subsequently had its credit rating downgraded<sup>38</sup>; Moody’s recently cited the city’s ongoing efforts to prop up the GON as a continued threat to its rating.<sup>39</sup> It has also had difficulty generating a positive cashflow in recent years.<sup>40</sup>
- *Opelika, AL* – this GON’s financial struggles have been well documented.<sup>41</sup>

### **3.5 The Systems Differ in Subtle But Important Ways**

A major implication of the study is that the “better” GONs are alike in many ways – their prices are generally lower; their terms of service are clearer; they don’t offer teaser rates; etc. A closer look, though, makes clear that these GONs are hardly monolithic. For example:

- Some systems, including those in Concord, MA, Longmont, CO, Marshall, MO, and Sandy, OR, do not offer video services. This not only reduces costs but also allows the systems to avoid key cable franchise obligations around build-out requirements, fees, and reporting – all well-established public policy imperatives.
- At least one system, in Indianola, IN, is open access, which means that residential service is delivered via a private company. This creates a different dynamic and set of incentives around pricing.<sup>42</sup>

- As previously noted, some of the GONs deployed by muni utilities also support smart grid operations, allowing them to obscure investments and engage in cross-subsidization.

#### 4. CONCLUSION

As policymakers, service providers, and other stakeholders continue to determine how best to improve broadband service in the United States, it is essential that their efforts are guided by data and objective analysis. The Berkman report attempts to offer such as it makes its case for a very specific “solution” to some of the broadband challenges facing the U.S. But a closer look at its analysis reveals many flaws and underscores how important it is for policymakers to take a more comprehensive and holistic view of the broadband space and any failings that might be evident. More often than not, successful solutions to supply-side challenges involve close collaboration between private providers and government officials. Such might not be palatable to those who view GONs as a panacea, but these partnerships have a solid track record when it comes to solving connectivity challenges in the most cost-effective and efficient manner. From the standpoint of good public policy, that is all that should matter.

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#### ENDNOTES

<sup>1</sup> See David Talbot, Kira Hessekiel & Danielle Kehl, *Community-Owned Fiber Networks: Value Leaders in America*, Berkman Klein Center for Internet & Society at Harvard University (Jan. 2018), <https://cyber.harvard.edu/publications/2018/01/communityfiber> (“Berkman Report”).

<sup>2</sup> *Id.* at p. 4-5.

<sup>3</sup> For additional discussion of the acknowledged shortcomings by the lead author, see *Retail Muni Fiber Networks Charge Less - Community Broadband Bits Podcast 289*, Jan. 17, 2018, Community Networks, <https://muninetworks.org/content/retail-muni-fiber-networks-charge-less-community-broadband-bits-podcast-289>.

<sup>4</sup> See, e.g., Jon Brodtkin, *City-Owned Internet Services Offer Cheaper and More Transparent Pricing*, Jan. 15, 2018, Ars Technica, [https://arstechnica.com/tech-policy/2018/01/city-owned-internet-services-offer-cheaper-and-more-transparent-pricing/?mc\\_cid=d38f1f4f40&mc\\_eid=d4bbc38d0d](https://arstechnica.com/tech-policy/2018/01/city-owned-internet-services-offer-cheaper-and-more-transparent-pricing/?mc_cid=d38f1f4f40&mc_eid=d4bbc38d0d),

<sup>5</sup> See Press Release, *Eshoo Introduces Legislation to Increase Broadband Access in Local Communities*, Jan. 18, 2018, Office of Congresswoman Anna G. Eshoo, <https://eshoo.house.gov/issues/telecommunications/eshoo-introduces-legislation-to-increase-broadband-access-in-local-communities/>.

<sup>6</sup> See Nick Russo, Danielle Kehl, Robert Morgus & Sarah Morris, *The Cost of Connectivity 2014*, Open Technology Institute at New America Foundation (Oct. 2014), <https://na-production.s3.amazonaws.com/documents/the-cost-of-connectivity-2014.pdf>.

<sup>7</sup> See, e.g., *Next Generation Connectivity*, Berkman Center for Internet & Society at Harvard University (Feb. 2010), [https://cyber.harvard.edu/sites/cyber.law.harvard.edu/files/Berkman\\_Center\\_Broadband\\_Final\\_Report\\_15Feb2010.pdf](https://cyber.harvard.edu/sites/cyber.law.harvard.edu/files/Berkman_Center_Broadband_Final_Report_15Feb2010.pdf).

<sup>8</sup> See, e.g., Christopher S. Yoo, *U.S. v. European Broadband Deployment: What do the Data Say?*, Center for Technology, Innovation and Competition at University of Pennsylvania (June 2014), <https://www.law.upenn.edu/cf/faculty/csyoo/workingpapers/us-vs-european-broadband-deployment.pdf>.

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<sup>9</sup> See *Berkman Report* at p. 13-14.

<sup>10</sup> *Id.* at p. 6.

<sup>11</sup> Data on file with the ACLP.

<sup>12</sup> Data on file with the ACLP.

<sup>13</sup> Data on file with the ACLP.

<sup>14</sup> *Berkman Report* at p. 16.

<sup>15</sup> See, e.g., 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. 101, 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> (“*Understanding the Debate*”).

<sup>16</sup> *Berkman Report* at p. 4.

<sup>17</sup> See generally *Understanding the Debate*.

<sup>18</sup> *Berkman Report* at p. 5.

<sup>19</sup> Indeed, GONs and other new market entrants that receive favorable treatment from municipalities (e.g., Google Fiber) might strategically choose not to offer voice or video services because these lines of business are much more complex and subject to greater regulatory burdens. See *Section 3* for additional discussion.

<sup>20</sup> *Berkman Report* at p. 5.

<sup>21</sup> See Maureen Lewis, *Digitally Unconnected in the U.S.: Who’s Not Online and Why?*, Sept. 28, 2016, NTIA, <https://www.ntia.doc.gov/blog/2016/digitally-unconnected-us-who-s-not-online-and-why>.

<sup>22</sup> See Octavia Carare et al., *The Willingness to Pay for Broadband of Non-Adopters in the U.S.: Estimates from a Multi-State Survey*, [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2375867](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2375867).

<sup>23</sup> See John B. Horrigan, *Digital Readiness*, Sept. 20, 2016, Pew Research Center, <http://www.pewinternet.org/2016/09/20/digital-readiness-gaps/>.

<sup>24</sup> *Understanding the Debate* at p. 94-95.

<sup>25</sup> See, e.g., George S. Ford, *The Impact of Government-Owned Broadband Networks on Private Investment and Consumer Welfare*, State Government Leadership Foundation (April 2016), <http://sglf.org/wp-content/uploads/sites/2/2016/04/SGLF-Muni-Broadband-Study-1.pdf> (“*Impact of GONs*”).

<sup>26</sup> See Charles M. Davidson & Michael J. Santorelli, *Updated Case Study of Government-Owned Broadband Network in Bristol, VA*, ACLP at New York Law School (Dec. 2016), <http://www.nyls.edu/advanced-communications-law-and-policy-institute/wp-content/uploads/sites/169/2013/08/ACLP-Bristol-Case-Study-Update-December-2016.pdf> (“*Bristol Case Study*”).

<sup>27</sup> *Impact of GONs*. See also Charles M. Davidson & Michael J. Santorelli, *Updated Case Study of Government-Owned Broadband Network in Chattanooga, TN*, ACLP at New York Law School (Oct. 2015), <http://www.nyls.edu/advanced-communications-law-and-policy-institute/wp-content/uploads/sites/169/2013/08/ACLP-Chattanooga-Case-Study-updated-October-2015.pdf> (“*Chattanooga Case Study*”).

<sup>28</sup> See, e.g., Karen Antonacci, *Longmont Council Gives First OK to \$7M NextLight Budget Boost*, Sept. 13, 2016, Times-Call, [http://www.timescall.com/longmont-local-news/ci\\_30360415/longmont-council-gives-first-ok-7m-nextlight-budget](http://www.timescall.com/longmont-local-news/ci_30360415/longmont-council-gives-first-ok-7m-nextlight-budget). A forthcoming ACLP “Closer Look” will evaluate the GON in Longmont.

<sup>29</sup> Such transfers between the Electric Division and Broadband Division are evident in a review of the parent utility’s annual report. See *Annual Report: Audited Financial Statements for Electric and Broadband Divisions – June 30, 2017 and 2016*, CDE Lightband, <https://cdelightband.com/tcg/wp-content/uploads/2017/10/FINAL-DIGITAL-BIG-BOOK-CDE-Lightband-2017-web.pdf>.

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<sup>30</sup> See, e.g., *Understanding the Debate* at p. 104.

<sup>31</sup> See, e.g., *Chattanooga Case Study*.

<sup>32</sup> See BroadbandNow.com, Longmont, CO, <https://broadbandnow.com/Colorado/Longmont>.

<sup>33</sup> See, e.g., Patrick Lucey & Christopher Mitchell, *Successful Strategies for Broadband Public-Private Partnerships*, at p. 8, Institute for Local Self-Reliance (July 2016), <https://ilsr.org/wp-content/uploads/downloads/2016/08/PPP-Report-2016-1.pdf>.

<sup>34</sup> See, e.g., Dave Flessner, *EPB Drops Gig Service Rate from \$300 to \$70 a Month*, Sept. 17, 2013, Times Free Press, <http://www.timesfreepress.com/news/local/story/2013/sep/17/epb-cuts-rates-gig-service/118962/>.

<sup>35</sup> *Bristol Case Study*.

<sup>36</sup> See *Sale of Crosslake Communications Finalized*, Sept. 2, 2016, Brainerd Dispatch, <http://www.brainerddispatch.com/business/4107511-sale-crosslake-communications-finalized>.

<sup>37</sup> See *Understanding the Debate* at p. 64-67.

<sup>38</sup> *Id.*

<sup>39</sup> See *Moody's Assigns A2 to City of Monticello, MN's GO Bonds*, Sept. 11, 2017, Moody's, [https://www.moody.com/research/Moodys-Assigns-A2-to-City-of-Monticello-MNs-GO-Bonds--PR\\_904190460?WT.mc\\_id=AM~RmluYW56ZW4ubmV0X1JTQl9SYXRpbmdzX05ld3NfTm9fVHJhbnNsYXRpb25z~20170911\\_PR\\_904190460](https://www.moody.com/research/Moodys-Assigns-A2-to-City-of-Monticello-MNs-GO-Bonds--PR_904190460?WT.mc_id=AM~RmluYW56ZW4ubmV0X1JTQl9SYXRpbmdzX05ld3NfTm9fVHJhbnNsYXRpb25z~20170911_PR_904190460).

<sup>40</sup> See, e.g., *Understanding the Debate* at p. 64-67; *Monticello City Data (2016)*, [http://www.ci.monticello.mn.us/vertical/sites/%7B46185197-6086-4078-ADDC-0F3918715C4C%7D/uploads/Arvig\\_Presentation- Jan\\_2017.pdf](http://www.ci.monticello.mn.us/vertical/sites/%7B46185197-6086-4078-ADDC-0F3918715C4C%7D/uploads/Arvig_Presentation- Jan_2017.pdf).

<sup>41</sup> See, e.g., George S. Ford, *Is Now the Right Time to Expand Opelika's Broadband Service?*, April 11, 2017, AL.com, [http://www.al.com/opinion/index.ssf/2017/04/is\\_now\\_the\\_right\\_time\\_to\\_expan.html](http://www.al.com/opinion/index.ssf/2017/04/is_now_the_right_time_to_expan.html).

<sup>42</sup> See, e.g., Charles M. Davidson & Michael J. Santorelli, *GONs Update*, at p. 9-12, ACLP at New York Law School (Dec. 2016), <http://www.nyls.edu/advanced-communications-law-and-policy-institute/wp-content/uploads/sites/169/2013/08/ACLP-Briefing-GONs-Update-December-2016.pdf>.