



# Correcting Community Fiber Fallacies

Yoo Discredits UPenn, Not Municipal Networks

by Christopher Mitchell

Community Networks Initiative  
at the Institute for Local Self-Reliance

## Executive Summary

Communities are leading the way to connect their residents and businesses to high quality internet access. As local businesses and residents demand better Internet options, local governments have stepped up with a variety of approaches from citywide municipal networks to incremental fiber-optic investments to partnerships to conduit systems to encourage competition.

However, the citywide fiber network approach has long drawn attention from large cable and telephone companies as well as others that are either skeptical or have advocated against municipal broadband. The latest paper in this vein, “Municipal Fiber in the United States: An Empirical Assessment of Financial Performance” from Professor Christopher Yoo and student Timothy Pfenninger of the University of Pennsylvania, suggests that municipal networks are bad investments from a narrow financial perspective.

Yoo and Pfenninger made numerous mistakes in their analysis and selected a methodology that was inappropriate to the data available.

- They erred in claiming Wilson, Lafayette, and Chattanooga have balloon payments at the end of the term. They have corrected that error in a press release. Other errors, such as confusing the technologies used by at least two networks, are less important but decrease the study’s credibility.
- Several of the cities dispute the accuracy of the numbers used in the calculations for their communities.
- The Net Present Value calculation is inappropriate in this context for many reasons and does not offer an

accurate view of the financial performance of these networks or the larger context of the investment impact on the community.

- The authors demonstrate little familiarity with basic patterns of Fiber-to-the-Home (FTTH) network economics.

Our responding report exposes multiple problems with the methodology in the Yoo and Pfenninger paper and explains why the Yoo and Pfenninger report does not provide any convincing evidence that municipal networks are bad investments.

The errors in the Yoo and Pfenninger paper only reinforce the importance of this decision being made locally, where local leaders have taken the time to gather all the relevant facts and can evaluate all the pros and cons of an investment before making any commitments.



## Introduction

In the 21st century, if your community lacks high-quality Internet access options, your community shouldn't expect commercial or residential growth. Local governments are leading the way to connect their residents and businesses to high quality internet access. But that hasn't stopped opponents of community broadband from dismissing their successes or falsely labelling them failures.

As more local governments take on the task of ensuring all of their local businesses and residents have access to high quality Internet access – not just high capacity but also reliable and affordable – they have been subject to numerous claims that they are unnecessary, total failures, or a threat to the American way of life.

Those familiar with the history of electrification in the United States will recognize how similar these claims are to those from private electric companies more than 100 years ago. After more than 120 years of experience, more than 2,000 municipal electric providers have proven that they can provide service at least as well as the private firms and often at higher reliability and lower cost.

While local governments get little respect in today's political environment, evidence demonstrates that they have the capacity to own and/or operate these telecommunications networks.

More than 500 communities now have municipal networks of some sort, ranging from citywide service to a network offering options only in the communities' business districts. These networks are a response to market failure – the lack of high quality options available to local businesses and residents.

The big cable and telephone companies have pushed back on the competitive threat from municipal networks, both with expensive lobbying campaigns and studies that claim municipal networks are bad investments. The latest study, from the University of Pennsylvania Law School with the backing of the telecom industry, purports to show that many citywide municipal networks lose money. Professors Christopher Yoo and Timothy Pfenninger issued “Municipal Fiber in the United States: An Empirical Assessment of Financial Performance” in May of 2017.<sup>1</sup>

The authors seem to be concerned that local government officials are not seriously considering the financial impact of a municipal network investment. In our experience working with hundreds of local governments, officials do seriously consider the risks associated with these investments.

**“... the majority of municipal networks have paid all their bills ...”**

The study suffers from numerous flaws and raises more questions about its own methodology than it does the financial standing of municipal broadband networks. **The simple fact**

**of the matter is that the majority of municipal networks have paid all their bills and are on track to do so while generating important benefits for their communities.** After correcting its many problems, this study fails to offer any compelling evidence to the contrary.

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<sup>1</sup> <https://www.law.upenn.edu/live/files/6611-report-municipal-fiber-in-the-united-states-an>.

## Overview of Problems

Unfortunately, this study suffers from numerous flaws that damage its credibility, one of which required a correction the same week the report was released. Author Christopher S. Yoo admitted that he had misunderstood the debt structure used by Lafayette, Louisiana; Chattanooga, Tennessee; and Wilson, North Carolina, three of the most prominent and well-documented networks in the nation.<sup>2</sup> Their study claims concern about balloon payments at the end of the debt term, but none of these networks have such a payment and Professor Yoo recognized the error in a press release with the correction. Nonetheless, he stands by the results of the paper.

While the balloon payment issue is a prominent and easy-to-verify error, the authors **fundamentally misunderstand the economics of building a FTTH network**. In short, the Net Present Value (NPV) metric is an inappropriate measure for this evaluation and particularly when the data set contains so many municipal networks that were engaged in large one-time capital expenditures during the period studied. Those expenditures bias the NPV to make the network appear less financially viable.

The authors use the term “systematic” no less than 8 times in the course of the report, which is odd in that they focus solely on one aspect of these municipal networks, totally ignoring the various other benefits – financial and otherwise – that may make a fiber-optic network a wise investment.

The result is akin to the developers of a major shopping center asking consultants to rigorously examine their plans. After studying the plans, the consultants reply that the parking lot is a total waste of money. It will sit on valuable land, be expensive to build and

maintain, and most damning, never earn a dime for anyone.<sup>3</sup> The consultants in this example aren’t necessarily wrong, but they ignore essential context. Unfortunately for Christopher Yoo and Timothy Pfenninger, they have missed both the essential context of what municipal networks do and mangled the financial analysis.

They make a variety of basic factual errors, including when many of the networks studied began connecting subscribers (the listed “start of project” appeared inconsistent and often significantly predated when the network began connecting customers). We could not identify a community they had interviewed, suggesting little effort to engage in basic fact-checking.

We believe there are additional errors that we cannot evaluate without more access to their assumptions and calculations. For instance, some of the numbers they present on Table 4 mystified officials at Chattanooga.<sup>4</sup> As best they can tell, the authors may have accidentally double counted some payments in their calculations. In short, this study suffers from many problems that should have been caught before it was published.



<sup>2</sup> Steven Barnes, “Correction,” Press Release, University of Pennsylvania Law School, May 26, 2017, <https://goo.gl/7XFWJ2>.

<sup>3</sup> Billy Ray, the municipal broadband pioneer, used this analogy in an interview we did with him in another context. We repurposed it here because it does a good job making the point.

<sup>4</sup> Yoo/Pfenninger report, p 11.

## The Big Problem

The data used in this study is inappropriate for this methodology. Christopher Yoo and Timothy Pfenninger base their analysis on a Net Present Value (NPV) calculation that, in their words; “provides a more accurate picture of the cash flowing into and out of an organization than do analyses based on a project’s operating profits and losses.”<sup>5</sup>

They could only find data on 20 citywide municipal fiber networks out of 88 that would fit their analysis, focusing on the years 2010-2014.<sup>6</sup> Yet 7 of the networks had either not yet finished the core network build or were less than 2 years into the business.<sup>7</sup> Another 4 networks had been in the business 3 years or less.<sup>8</sup> More than half of the data set were very young networks. The age is important for economic reasons but also because it is hard to

predict success or failure in such a young network.

Given this sample, the authors should have adopted a different methodology, sought additional data, or postponed their analysis entirely until they received adequate information to make their sweeping assertions.<sup>9</sup>

These details are important because, as the authors note, NPV calculates cash flows. Where is the money going? Early in a network, each new subscriber is a drain on the finances of the network. Consider that Chattanooga added approximately 60,000 subscribers during the period studied.<sup>10</sup> Each subscriber cost EPB approximately \$1,000 from the labor and capital cost of installing a drop line, optical network terminal, and other equipment. That is a flow of nearly \$60 million in one-time costs

### The Problem with NPV

Net Present Value is typically used by a firm seeking to compare different investment options, not to confirm a given approach is wise. One of the benefits of NPV is that it incorporates depreciation into the calculation. But that may not be appropriate for this analysis.

Depreciation is important to private sector entities largely for tax purposes. For public utilities, the benefit of depreciation is that one has all the funding necessary to replace the investment at the end of the term, but we do not know the length of the term for fiber-optics. One consultant we spoke with said that they depreciate the electronics, not the entire project because the fiber will last much longer than the debt term.

**The result is that some networks may appear to have negative NPV merely because of depreciation, but that has nothing to do with the financial viability of the network.** Worst-case scenario from failing to depreciate appropriately is needing to issue a new bond at the end of the debt term to replace pieces of the network. But this is precisely what electric utilities have done for 100 years – bond for infrastructure.

<sup>5</sup> Yoo/Pfenninger report, p. 1.

<sup>6</sup> We do not accuse them of cherry-picking the networks studied. They focused on municipal networks that reported bond debt separately from other utilities. Unfortunately, that criteria resulted in a biased data set.

<sup>7</sup> Salisbury, Monticello, Wilson, Chattanooga, Lafayette (started connections in 2009), Powell, Loma Linda.

<sup>8</sup> Tullahoma, Brookings, Powell, Clarksville.

<sup>9</sup> Continuing with the retail analogy, if I wanted to analyze a retail business but could only find data on sales from January, February, and March, it would be irresponsible to extract from that data to evaluate the value of an industry known to have seasonably variable sales.

<sup>10</sup> Chattanooga started 2010 with fewer than 3,000 subscribers and exited 2014 with more than 63,000.

away from the utility. Each customer is effectively a multi-year loss to the utility until that install cost is paid. Thus, the first several years (sometimes even 7-10 years) may look bad from an NPV analysis because of the many one-time costs that come from both building a network and attaching subscribers to it.

Most of these networks are owned by municipal electric utilities that use the fiber for SCADA and other services as well as delivering telecommunications services. It is not clear how the authors accounted for this use of the network in their calculations. However, the utilities use heavily regulated rate models to ensure they are accounting correctly for the costs of the system used by the electric division.

When more than half of the data set contains networks where customers are still a net drain on the network, the resultant analysis will appear bleak. In short, this methodology on this data set is entirely inappropriate. We can cite multiple lines of evidence demonstrating that this bias in the data had a significant impact.

**1** Chattanooga's EPB Fiber Optics is doing **extreeeeeeeeemly** well. Though the authors paint a bleak picture for it, the utility has just announced that it has paid off all the debt on the communications equipment.<sup>11</sup> The debt for the electric side has such a low interest rate, they see no reason to retire it early at this point. The utility has more than 90,000 subscribers and projecting net income of \$26.6 million in FY 2017. It has no problem paying all of its costs and has a very secure future, but the flows may still not be balanced because the one time cost of connecting all those subscribers was significant.<sup>12</sup> Chattanooga's Electric Power Board has reported that its electric rates would be 7 percent higher if it did not have the fiber network and communications services.



Chattanooga EPB Lineman Photo from EPB Facebook Page

<sup>11</sup> <http://www.chattanoogan.com/2017/5/19/348318/EPB-Budget-Will-Not-Include-Electric.aspx>.

<sup>12</sup> Incidentally, this is why competition is difficult to sustain in telecommunications – established incumbents can price far lower than a newcomer that still has to amortize major investments.

2

The authors seem puzzled that the media has not caught on to the supposed story that Wilson's Greenlight Fiber network is exhibiting financial distress.<sup>13</sup> The media isn't confused, the authors are. When evaluated correctly, Wilson's Greenlight is financially strong. The network invested significantly in early years to connect subscribers and is in no danger of being unable to pay its operating costs or debts. Wilson's top 10 employers all use the municipal fiber network and more than 700 additional local businesses rely on it. The fiber was even cited as a factor in the utility's ability to decrease its electric rates 18 percent.<sup>14</sup>



BTES Headquarters Photo from BTES Website

3

The networks that appear to do better in this analysis are the older ones. We contacted Professor Yoo to ask why they included Fayetteville, Tennessee in the data set because it is a hybrid fiber-coax (cable) network, not full fiber like the others. Professor Yoo told me he wasn't aware of that prior to me asking. (This is not an uncommon error to make with municipal networks and one of the reasons those weighing in on this field should take the time to better understand it.) He claimed removing this would make the overall analysis seem worse, because Fayetteville was doing better than average. That is what one would expect because Fayetteville has largely amortized its costs. True also of WindomNet in Minnesota, which the authors claim would break even more quickly than the others. The analysis is heavily biased by the younger networks that are in growth mode.

4

The predictive value of the Yoo and Pfenninger analysis is quite poor. As noted by the Coalition for Local Internet Choice, major bond rating agencies have recently upgraded the bond rating for Wilson, Chattanooga, and Lafayette.<sup>15</sup> This study claims those cities will never break even. Chattanooga and Bristol, Tennessee have already retired the debt on their telecom services.

<sup>13</sup> "Despite the negative cash flow, a review of news reports failed to uncover any indications that Wilson is exhibiting financial distress." p. 23, "Municipal Fiber in the United States: An Empirical Assessment of Financial Performance," Christopher S. Yoo and Timothy Pfenninger, <https://www.law.upenn.edu/live/files/6611-report-municipal-fiber-in-the-united-states-an>.

<sup>14</sup> Release from Wilson, received via email in response to press inquiries.

<sup>15</sup> [http://www.localnetchoice.org/connections/professor-yoos-flawed-study-flunks-test-on-municipal-broadband/#\\_ftn7](http://www.localnetchoice.org/connections/professor-yoos-flawed-study-flunks-test-on-municipal-broadband/#_ftn7)

All of the issues the authors identify with the municipal networks come down to the inappropriateness of using this data to perform an NPV calculation. Even if these networks were more mature, it would be worth noting that the early years under study, 2010-2014, were extremely hard years for businesses across the United States due to the recession.

Responding to some early criticism, Yoo noted that the networks cover a range of ages.<sup>16</sup> But the ages listed in Table 1 and referenced in Table 5 are inconsistent.<sup>17</sup> Some seem to be dated from financing and others from first subscribers connected but the net effect is that the study implies many of the networks are older than they actually are. Lafayette; Chattanooga; Powell, Wyoming; and Tullahoma, Tennessee, only began connecting customers in 2009. Monticello, Minnesota, and Salisbury, North Carolina hooked up their first in 2010. Loma Linda, California, was not yet citywide, and UTOPIA is a far ways from passing all the households in the project area.

Even if the authors' NPV test were an appropriate measure for success, the results are not useful when the time period studied is so heavily weighted toward networks making large one-time capital expenditures. An NPV test would be more appropriate, though only as a piece of a holistic analysis, for networks that are more mature. In any event, an NPV test alone is certainly insufficient to answer the question of which municipal networks are successful, which is how many will attempt to use this study for their own ends.

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<sup>16</sup> <http://marketintelligence.spglobal.com/our-thinking/news/hard-data-on-municipal-broadband-networks>.

<sup>17</sup> Yoo/Pfenninger report, pp. 6 and 13 respectively.



## Can Someone Replicate This?

The paper does not explain many assumptions or calculations that would be necessary to fully examine the model used. However, both Chattanooga and Wilson have said that they cannot validate the numbers used by the study.

In response to press queries, Wilson has said,

“We are unable to ascertain the source for some of the data presented in the study. More accurate analysis of Greenlight’s performance can be found in the City of Wilson’s Annual Certified Financial Report, which confirms that Greenlight’s revenues exceeded expenditures for each year in the study period. The City’s strong financial position was recently recognized by Fitch Ratings with a bond rating upgrade, and affirmed by Moody’s.



The methodology used in the study is inconsistent with public utility financial analysis and, if applied to other utilities, would likely deem most all local government utilities as failures. We do not know the sources of data used for the study, as Wilson was never contacted, but we can confirm that data attributed to Greenlight is incorrect.”

The authors intend for Table 4 on page 11 to offer some insight into their approach. But it just led to Chattanooga officials scratching their heads. They cannot recreate those figures and believe there may be some unintentional double-counting in calculating their figures.

Talking to people with stronger financial wizardry skills than our organizations have in-house, we have multiple questions about some of the assumptions and calculations. Even for those that believe this methodology is appropriate, some of the calculations seem to be off.

## Odd Claims and Errors

In reading this study, we could not help but suspect that authors are not very familiar with municipal networks, the reasons communities have constructed them, or the basic economics of FTTH.



As noted in the “Big Problem” section, the authors do not demonstrate an understanding of the basic economics behind the capital costs of building a FTTH network. Figure 1 on page 10 suggests that the authors believe negative cash flows take place only in year zero and their discussions elsewhere in the paper confirm this. For instance in discussing BTES, “The strong 2010 and 2011 results thus reflect the success of BTES’s DSL operations, although BTES undoubtedly incurred capital costs in 2010 and 2011.” So many mistakes. First, BTES was FTTH from the start. Bristol officials cannot figure out how the authors made those calculations because they have reported stronger financials. But if Bristol had invested in fiber in 2012 as claimed incorrectly by the authors, one should not be surprised if they took a multi-year hit as they converted customers because of the associated costs.

But what actually happened is that BTES has had such a strong financial performance that it reports having paid down all the debt associated with the telephone, television, and Internet services. The electric system retains some debt associated with the fiber-optics network but the amount of revenue generated by the telecommunications services actually pays for the electric department’s use of the fiber as well. In yet another case, a municipal fiber network is keeping electric rates lower than they otherwise would be for the entire community.



Throughout the paper, the authors focus on households for various measures. But the proper measure on which to base the performance of a municipal network is **premises**. Local businesses exerting pressure to improve local connectivity drove the vast majority of citywide municipal fiber network build outs. Even though they serve everyone in the community, they often have a large number of business subscribers and that business revenue is important to the financial performance. Using households as a focus is odd, especially when discussing the network in Vernon, California, which may be nationally unique in having 1,570 businesses and 21 households.<sup>18</sup> Because UTOPIA was not fully built out, discussing it in terms of the number of households in the total project area is inappropriate. Conventional analyses cover only the premises that are eligible to subscribe. This is why it also appears to be outlier in some calculations – though it is destined to be an outlier in any event due to the large debt it has per passed premise.



The authors appear to have been focusing on citywide fiber-optic networks but Loma Linda and UTOPIA were not citywide at the time studied. Fayetteville is an HFC cable network. Unlike the others, Churchill County's network is actually the incumbent telephone network, owned and operated by the County for nearly 130 years.



The authors need a more thorough understanding of the dynamics around municipal electric utilities. They claim, “the need for access to rights of way has meant that until recently municipal broadband has deployed in areas where the city already provides electric power...”<sup>19</sup> This claim is a non sequitur. Municipal broadband networks have been more common in cities with public power because the utility has often already installed fiber-optics to connect substations and generation facilities. Additionally, public power cities have billing systems, bucket trucks, and the trust of the community in ways that non-public power communities may not. Though municipal electric utilities built most of the citywide municipal broadband networks, local governments without public power have used a variety of other models to improve Internet service, including Santa Monica, Westminster, Sibley County, and many others.<sup>20</sup>

Throughout this paper, the authors fail to recognize that municipal fiber networks owned by electric companies use the network for SCADA and various other electric purposes. Yoo and Pfenninger do not seem to account for that usage. These applications can generate incredible value.<sup>21</sup>

In fact, the authors allege that the networks cannot cross-subsidize from telecom to electricity. That is incorrect. Subsidizing the telecom side with electric ratepayer (monopoly) money is

<sup>18</sup> American Fact Finder. Vernon, California. [https://factfinder.census.gov/faces/nav/jsf/pages/community\\_facts.xhtml?src=bkmlk](https://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml?src=bkmlk).

<sup>19</sup> Yoo/Pfenninger report, p. 5.

<sup>20</sup> See “Santa Monica City Net: An Incremental Approach to Building a Fiber Optic Network,” Eric Lapland and Christopher Mitchell, 2014, <http://www.ilsr.org/wp-content/uploads/2014/03/santa-monica-city-net-fiber-2014-2.pdf>, “Sibley County, RS Fiber: Fertile Fields for New Rural Internet Cooperative,” Scott Carlson and Christopher Mitchell, 2016, <https://muninetworks.org/reports/rs-fiber-fertile-fields-new-rural-internet-cooperative>, and articles on Westminster, <https://muninetworks.org/tags/tags/westminster>.

<sup>21</sup> See “Smart Grid Paybacks: The Chattanooga Example,” David Talbot and Maria Paz-Canales, 2017, <https://cyber.harvard.edu/publications/2017/MF/Chattanooga>

strictly forbidden and audited closely by Tennessee Valley Authority and Tennessee Regulatory Authority. But moving profits from the competitive telecom side to the electric side is permissible and can help to hold down rates. BTES reports that when they started with fiber-optics, they had 67 FTEs. They now have 69, but the electric division only has to pay for 57 because so many are paid for from the telecom side revenues.<sup>22</sup>

**“... local governments  
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<sup>22</sup> Telephone Interview with Dr. Browder. June 1, 2017.

## Essential Context

Any study purporting to be “systematic” should make a better effort to understand the actual system being studied. There is no effort to explore why communities have built these networks, though the authors suggest it may be about providing gigabit Internet connectivity. If communities were investing in citywide municipal networks merely to provide gigabit access, we might join the authors in questioning their logic and decision-making. However, this confuses a marketing tactic with the larger goal: ensuring local businesses and residents have the Internet access the community needs to thrive in the modern era.

Though the authors are not clear on this subject, they seem to regard the market as functional and municipal networks as a nicety. The communities that have built these networks do not view them that way, largely because local businesses and residents made it clear that their needs had not been met by existing providers. This context is essential. Though the authors did not have proper data for the methodology selected, we believe that a proper analysis with relevant data would show that some municipal networks do have a negative NPV when measured as narrowly. Not most, but some.

Consider Windom with some 5,000 residents in southwest Minnesota, and one of the smallest and earliest municipal networks in the nation. Even if we stipulate that the network has not paid for itself solely out of revenues, having that municipal fiber network available was essential when a local business called WindomNet’s general manager and told him “Dan, you need to get your butt out here now.”<sup>23</sup> Fortune Trucking Company was located outside of town and the incumbent telco had just refused to provide a service it previously claimed able to offer. The trucking company was considering moving many jobs to another location out of state. Being able to run a municipal fiber to that business saved tens of jobs.<sup>24</sup> A local manufacturing facility expanded because it had better connectivity in rural Minnesota than the Minneapolis and Saint Paul metro, creating local jobs in Greater Minnesota. And WindomNet later expanded to connect nearby rural areas, generating hundreds of thousands of dollars per year in aggregate savings.<sup>25</sup>

We would agree with one of their conclusions: “These results suggest that the manner in which a municipal fiber project is operated, both in terms of generating revenue and minimizing operating cost, play a more critical

### Policy Continuum

Of the more than 500 communities with municipal networks, the majority have not attempted to build citywide yet. Many are incremental investments at very low risk for specific benefits, such as connecting local businesses. Others have partnered in a variety of ways with independent ISPs to achieve various public policy goals. But this paper seems to attempt to focus specifically on citywide FTTH networks (though we have noted some of the networks included in the study do not fit that description). Nonetheless, the context of a continuum of local investments to correct market failure is important.

<sup>23</sup> “All Hands on Deck: Minnesota Local Government Models for Expanding Fiber Internet Access,” Lisa Gonzalez and Christopher Mitchell, Institute for Local Self-Reliance, 2014, <https://muninetworks.org/reports/all-hands-deck-minnesota-local-government-models-expanding-fiber-internet-access>.

<sup>24</sup> If this doesn’t seem like a big deal, you haven’t lived in a small community.

<sup>25</sup> See “All Hands on Deck.”

role in the success of a municipal fiber project than the upfront capital costs.”<sup>26</sup> In our experience, two of the most important factors are community engagement and advertising competence in the financial success of a network. This operating impact is also why a network that may appear failed today may be regarded a success tomorrow. One of the themes the authors get correct is that networks are not static “successes” or “failures” – they may transition from one state to the other and back.

The authors want local decision-makers to be aware of the costs of supporting a municipal. In our experience, they are. They know that elected officials lose their jobs when major investments go south. But what is more important is the compounded harm from years of bad Internet access. This harm is clear when the population declines year after year as slow DSL and dial-up destroy property values and drive young people away. This is important context and its omission in any study of municipal networks is baffling. We fully agree that people should have all the data available in evaluating municipal networks but we worry that these authors seem only interested in exploring an exaggerated financial risk rather than the whole picture.

Had the authors stuck solely to the NPV calculations and explorations, it is possible to imagine why they would have wanted to avoid the challenge of providing greater context. But they provided seven short case studies that focused on negative qualities of the network while either ignoring or doubting known benefits from the networks that these communities experience daily.

## Yoo and Pfenninger: Bias

We want to be clear that we are not accusing Professors Yoo and Pfenninger of the kind of disheartening academic corruption found in some institutions.<sup>27</sup> We have decided to focus on the arguments and claims in their paper rather than any bias that may have motivated it. Yoo and Pfenninger have made numerous basic factual errors and used a fatally flawed methodology. But there are additional statements and frames that suggest at least a slight bias in favor of the powerful cable and telephone companies that support the Center for Technology, Innovation and Competition and U Penn (CTIC).

- The authors apparently did not contact the communities themselves to understand the local dynamic nor engage in basic fact-checking, which would have avoided the Wilson, Lafayette, and Chattanooga balloon payment confusion. Similarly, the authors do not seem to understand why communities build these networks. The Institute for Local Self-Reliance and Next Century Cities have developed a library exploring the subject from audio interviews to videos to reports to discussions at live conferences.<sup>28</sup> We welcome the authors to engage with us and our communities to better understand motivations and at the very least, be better positioned to offer a constructive critique.
- The authors see fit to note when the bond ratings of a municipal government have been lowered in part or wholly due to perceptions about the performance of a municipal fiber network. Yet they do not cite when bond ratings are improved and the

<sup>26</sup> Yoo/Pfenninger report, p.17.

<sup>27</sup> <https://www.propublica.org/article/these-professors-make-more-than-thousand-bucks-hour-peddling-mega-mergers>.

<sup>28</sup> See Community Broadband Bits Podcast, <https://muninetworks.org/content/community-broadband-bits-podcast-index>, see also Videos at MuniNetworks.org, <https://muninetworks.org/content/videos>, see also Reports Highlighted by MuniNetworks.org, <https://muninetworks.org/reports>, see also Next Century Cities Resources <http://nextcenturycities.org/resources/>.

rating agency specifically credits the municipal fiber operation. The one exception is Burlington, Vermont, where they note the bond rating was restored when the network began to be privatized. **But both Chattanooga and Wilson have seen bond ratings upgrades, in part due to the fiber network performance.**

- The case studies are strongly biased against the networks. For instance, the case study on Chattanooga says, the city “claims to have attracted new businesses and jobs to the area.”<sup>29</sup> Many have documented jobs moving to the area.<sup>30</sup>
- The report switches between skepticism of municipal fiber and FTTH more generally. In the introduction, the discussion about municipal fiber notes “Confidence in FTTH was buoyed by early reports about Google’s efforts to build a fiber network in Kansas City...” before going on to say, “Google Fiber’s recent announcement that it was reducing its staff by half and ceasing any further expansion of its fiber networks further dampened enthusiasm for FTTH.”<sup>31</sup> But there is never any mention of the motivations for these investments – the broken market for Internet access in most communities

that leaves most Americans stuck between a cable monopoly and slow DSL.<sup>32</sup> The report largely ignores the state of the Internet access market in most communities but one cannot but help get the impression that they believe it largely works – particularly with claims about 5G and G.Fast<sup>33</sup> being a solution. It ignores the real problem many communities seek to fix: the broken market structure rather than just providing a new technology.

- A common claim used by the cable and telco critics of municipal networks is to raise the \$111 million Department of Energy stimulus grant to Chattanooga’s Electric Power Board. Yet these claims somehow always fail to provide essential context. That was for the electric side – they invested in 1,400 Intelli-rupters that cost \$50,000 each. That is \$70 million right there. It is not clear how being able to segment the grid in milliseconds aids their sales of home Internet connections.

<sup>29</sup> Yoo/Pfenninger report, p. 19.

<sup>30</sup> See “The Realized value of fiber infrastructure in Hamilton County, Tennessee,” Bento J. Lobo, Ph.D., CFA, June 18, 2015, <http://media-cdn.timesfreepress.com/news/documents/2015/09/15/realizedvalueoffiberlobofinaljune18201515650443634.pdf>, see also Economic Development fact sheet, ILSR, 2012, <https://muninetworks.org/sites/www.muninetworks.org/files/fact-sheet-econ-dev.pdf>, see also “Chattanooga Gets 150 More Jobs... From Comcast,” <https://muninetworks.org/content/chattanooga-gets-150-more-jobs-comcast> and “Amazon’s Chattanooga Distribution Center is Expanding,” <https://muninetworks.org/content/amazons-chattanooga-distribution-center-expanding> (added more than 1,000 jobs) and “Chattanooga EPBFI Network Leads to More Jobs,” <https://muninetworks.org/content/chattanooga-epbfi-network-leads-more-jobs> (added 140 jobs) and “Broadband Equity” (video), Tennessee Fiber Optic Communities, 1,000 jobs created in tech sector since 2009 due to FTTH network, <https://vimeo.com/130354219>.

<sup>31</sup> Yoo/Pfenninger report, p. 2.

<sup>32</sup> The one exception is that Ed Rendell apparently noted this key problem in the live event that was webstreamed and the very cable and telco-heavy audience was not amused.

<sup>33</sup> G.Fast is a standard that telephone companies have been claiming will allow them, in extremely limited circumstances, to offer capacity up to 100 Mbps. To our knowledge, it has not been used in the real world with the exception of apartment buildings. Incumbent providers frequently claim technological change is right around the corner that will obviate the need for investment or additional choices in the market.

Candidly, there is at least one trend that runs the opposite direction. Nearly all of the critics of municipal networks that are tied to the large cable and telephone companies refer to municipal networks as “government-owned networks” or GONs. Among the ecosystem of communities, consultants, vendors, academics, etc. that study the networks independently, they are referred to as muni fiber, municipal networks, community networks, or something similar. In using the proper terminology rather than focus-grouped opposition talking points, the authors demonstrate important independence. Additionally Professor Yoo has noted some of the limits of data at the event announcing the report, though without seeming to fully appreciate the implications of the young age bias in so much of the data).

## Some Municipal Networks Have Failed

An additional reason that this financial analysis looks bleak is that several of the networks included have legitimately bleak financial outlooks or have defaulted on debt. Though this is rare among municipal networks, it has happened. Both Monticello and Burlington have had to work out settlements with creditors after they encountered seriously problems.<sup>34</sup>

UTOPIA has extremely high debt that it has been unable to pay out of its network revenue. The communities that make up UTOPIA pay the debt out of other revenues, including sales taxes in some places. Nonetheless, UTOPIA’s enviable competitive environment for services has helped businesses to thrive and generated some indirect benefits for the communities, showing that even networks that have failed to achieve their financial objectives may generate benefits.

One important context of UTOPIA is that it was harmed by state laws passed at the behest of the incumbent cable and telephone companies.<sup>35</sup> As the authors note above the success or failure of a project goes well beyond the upfront capital costs. The role of state laws in deliberately raising operating costs or limiting expansion for a municipal network must be included among the challenges networks face.

**“The role of state laws in deliberately raising operating costs or limiting expansion for a municipal network must be included among the challenges networks face”**

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<sup>34</sup> We have covered each extensively, because our charge is to help communities be strong and independent, not merely owners of municipal networks. See stories on Monticello at <https://muninetworks.org/tags-111>, see also stories on Burlington at <https://muninetworks.org/tags-1> and <https://muninetworks.org/tags-40>.

<sup>35</sup> “Pssst....Wanna Buy A Law: How the American Legislative Exchange Council turns a bill into many, many, many laws,” Brednan Greely and Alison Fitzgerald, Bloomberg Businessweek, Dec. 1 2011, <https://www.bloomberg.com/news/articles/2011-12-01/pssst-dot-wanna-buy-a-law>.

## Conclusion

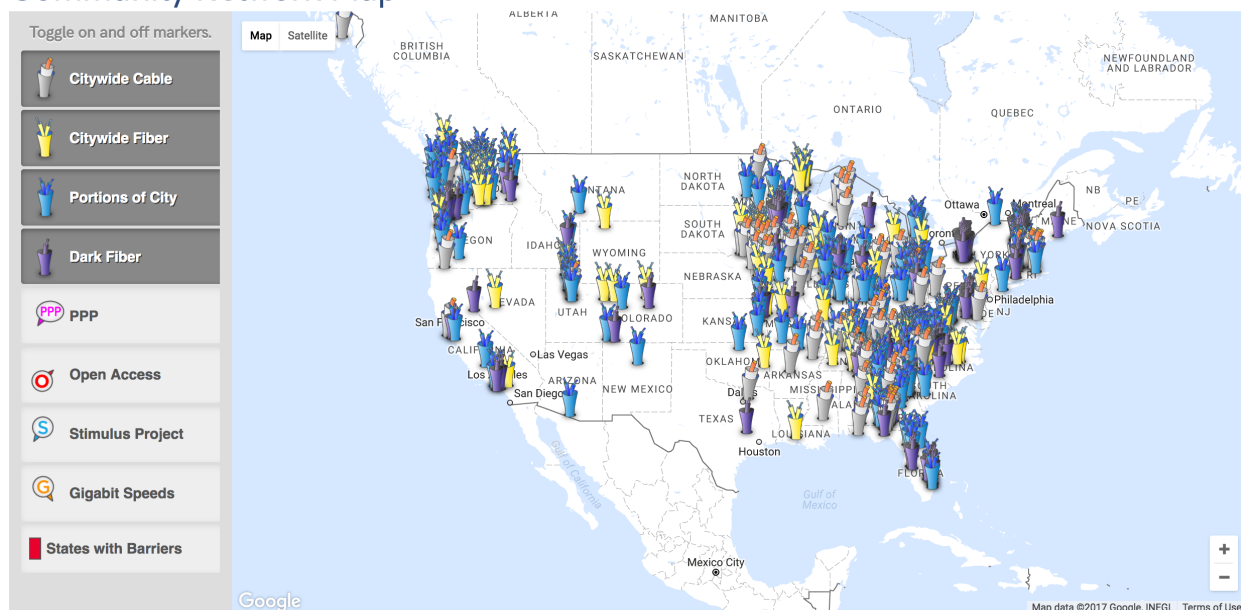
This study has numerous problems from basic facts to the methodology. As people committed to studying the comparatively small universe of municipal broadband, we fully appreciate the challenges of finding appropriate data with which to do a large scale analysis. But in our experience, the networks are so varied and so few that attempting to analyze these investments without the local context and doing individual fact-finding results in unusable findings. That is the result of the Yoo and Pfenninger paper.

Local decision-makers must engage in due diligence before committing to a major investment; in our experience, they do. They look into the finances of existing municipal networks and find that in most cases, they are able to pay their operating cost and debts while generating important benefits for the community. Some – like Chattanooga; Cedar Falls, Iowa; and Spanish Fork, Utah – deliver incredible results well beyond expectations. Others are content to break even and focus on creating opportunities in the community.

Tennessee’s Morristown is more vibrant and many more dollars stay in the local economy because of its network. Lafayette’s Fiber has led to a high tech job boom, which was the most important result they desired. They wanted to make sure their kids could grow up and live in a stronger, diversified economy. These are the benefits of municipal broadband investments – in the present and in the future.

**“... the networks are so varied and so few that attempting to analyze these investments without the local context and doing individual fact-finding results in unusable finding.”**

### Community Network Map



Our Interactive Community Network Map from [MuniNetworks.org](http://MuniNetworks.org)



**The Institute for Local Self-Reliance**  
*ILSR.org*



The Institute for Local Self-Reliance is a people-community-policy driven nonprofit. Our mission is to provide innovative strategies, working models, and timely information to support environmentally sound and equitable community development. By delving into how programs and policies work, we have documented challenges, risks, and solutions to keep local economies strong since 1974.

**Community Networks Initiative**  
*MuniNetworks.org*



For the past 10 years, the Community Networks Initiative of the Institute for Local Self-Reliance has documented and analyzed the role of community broadband networks throughout the U.S. Our research includes networks owned and operated by municipalities, county governments, cooperatives, nonprofits, and public-private partnerships.

**Next Century Cities**  
*NextCenturyCities.org*



Next Century Cities is a nationwide coalition of more than 170 mayors and local government leaders committed to ensuring the benefits of fast, affordable, reliable broadband Internet access for their communities.