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MEMORANDUM

To: Tennessee Broadband Coalition

From: Jim Baller and Casey Lide

Date: March 4, 2006

Re: The Case For Public Fiber-to-the-User Systems

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The Tennessee Broadband Coalition has asked the Baller Herbst Law Group to respond to the main criticisms that opponents of public Fiber-to-the-User (FTTU) initiatives have raised in Tennessee and elsewhere. The Coalition would like to know whether any of these criticisms is valid, and, if so, what lessons the Coalition can learn from them to avoid or mitigate similar problems in Tennessee.

Over the last decade, Baller Herbst has been involved in most of the leading public communications projects in the United States. In almost all of these projects, the incumbent telephone and cable companies have rejected or ignored the locality's invitation to join in cooperative efforts that would benefit all concerned and have instead mounted massive media and lobbying campaigns in opposition to the proposed public network. Often, the incumbents have funded support from industry "experts" and artificial "grassroots" groups (which have come to be known as "Astroturf").

In their campaigns, the incumbents and their allies have typically included emotional appeals to private-enterprise ideology; flawed statistics; complaints about supposedly unfair advantages that municipalities have over the private sector; attacks on the motives and competency of public officials; and false or incomplete, misleading and irrelevant examples. In many cases, these arguments have mirrored the unsuccessful arguments that the major electric power companies and their allies made against municipal ownership a century ago, when electric power was the must-have technology of the day, and thousands of unserved or underserved communities established their own electric utilities to avoid being left behind in obtaining the benefits of electrification.

We have previously written an article that refuted each of the ten most common arguments that opponents of municipal broadband initiatives have been making during last

decade.¹ The article applies to municipal broadband generally and is applicable in many respects here. It does not, however, focus specifically on fiber projects such as the one that EPB is contemplating.

In this paper, we concentrate on FTTU projects. We begin with background information that will put such projects into their global context. We then analyze the experiences of the leading public FTTU projects in America. Finally, we turn to the supposed “municipal failures” that incumbents often cite and show that the incumbents’ claims of failure are simply wrong, outdated, or irrelevant to this project.

I. THE CRITICAL ROLE OF FIBER OPTIC NETWORKS IN PRESERVING AMERICA’S GLOBAL COMPETITIVENESS

A. America’s Plunging Global Status in Broadband Deployment and its Consequences

As President Bush recognized in his latest State of the Union address, America’s ability to remain competitive in the “dynamic world economy” is at risk.² Noting the emergence of competition from India and China, he challenged America to take the dramatic steps necessary to ensure that we will continue to occupy the position of global leadership to which we have become accustomed. America’s rapid decline in standing in broadband deployment among the leading nations is emblematic of what has gone wrong and of what needs to be done to correct it.

The United States gave birth to the Internet, and in the 1990s, it was the unchallenged world leader in broadband deployment. By 2001, however, it had fallen to 4th place among nations in the world in per capita broadband deployment. Since then, it has plunged to 19th place.³ Furthermore, the United States has also fallen far behind the leading nations in access to high-capacity broadband connectivity, cost per unit of bandwidth, and growth of broadband subscribers. While the United States is still first in absolute number of broadband lines, its lead will soon be overtaken by China.⁴

Furthermore, if the twenty-five nations in the European Union are viewed in the aggregate – as many argue that they should be⁵ – they already have more broadband lines than the United States today and will have a huge lead by 2010.⁶ By one recent estimate, the EU has

1 Jim Baller, “Deceptive Myths About Municipal Ownership -- Disinformation about public ownership is impeding progress,” *Broadband Properties Magazine* (May 2005), http://www.baller.com/pdfs/Baller_BroadbandProperties_May05.pdf.

2 <http://www.whitehouse.gov/stateoftheunion/2006/index.html>.

3 <http://www.websiteoptimization.com/bw/0601>.

4 *Id.*

5 See, e.g., T.R. Reid, *The United States of Europe* (2005).

6 <http://www.internetworldstats.com/europa4.htm>; <http://www.ispreview.co.uk/cgi-bin/news/viewnews.cgi?id=EEpykEuVyEhvVssPqv>.

almost 53 million broadband users, with an increase of almost 20 million during 2005.⁷ Meanwhile, U.S. residential broadband uptake has “stalled.”⁸

How important is this? It is immeasurably important because broadband will increasingly provide the foundation for virtually everything that we do at work, at home, and at play. As a result, in the emerging global economy, the countries that have the most robust, ubiquitous, and affordable broadband infrastructure will be the ones that are most successful, and those that fall behind may not recover for years, if ever. The Brookings Institution estimated that America’s broadband decline could lead to a potential loss of \$1 trillion in economic productivity over the next decade, as well as more than 1.2 million jobs that could be created by better broadband.⁹

Comparing the United States and Japan, Thomas Bleha expressed these concerns forcefully in his trenchant article, “Down to the Wire,” published in *Foreign Affairs*:¹⁰

When the United States dropped the Internet leadership baton, Japan picked it up. In 2001, Japan was well behind the United States in the broadband race. But thanks to top-level political leadership and ambitious goals, it soon began to move ahead. By May 2003, a higher percentage of homes in Japan than in the United States had broadband, and Japan had moved well beyond the basic connections still in use in the United States. Today, nearly all Japanese have access to “high-speed” broadband, with an average connection speed 16 times faster than in the United States -- for only about \$22 a month. Even faster “ultra-high-speed” broadband, which runs through fiber-optic cable, is scheduled to be available throughout the country for \$30 to \$40 a month by the end of 2005. And that is to say nothing of Internet access through mobile phones, an area in which Japan is even further ahead of the United States.

It is now clear that Japan and its neighbors will lead the charge in high-speed broadband over the next several years. South Korea already has the world's greatest percentage of broadband users, and last year the absolute number of broadband users in urban China surpassed that in the United States. These

⁷ *Telecom Paper*, Feb. 20, 2006, citing report by European Commission, <http://www.telecom.paper.nl/news/article.aspx?id=118059>. The report also found that the production and use of information and communication technology accounts for around 40 percent of productivity growth and one quarter of overall growth in Europe.

⁸ Daniel Terdiman, “Study: Americans’ Home Net Adoption Slowing,” *CNET News.com*, Feb. 23, 2006, http://news.com.com/Study+Americans+home+Net+adoption+slowing/2100-1034_3-6042670.html?tag=nefd.top.

⁹ John Reinan, “Broadband Gap Looms as Net Loss for U.S.,” *Minneapolis Star Tribune*, Feb. 22, 2006, <http://www.startribune.com/535/v-print/story/257956.html>.

¹⁰ <http://www.foreignaffairs.org/20050501faessay84311/thomas-bleha/down-to-the-wire.html?mode=print>.

countries' progress will have serious economic implications. By dislodging the United States from the lead it commanded not so long ago, Japan and its neighbors have positioned themselves to be the first states to reap the benefits of the broadband era: economic growth, increased productivity, technological innovation, and an improved quality of life.

Similarly, in his book *The World is Flat*,¹¹ which emphasized developments in India, Thomas Friedman shed further light on the world that is emerging and America's role in it.

The dynamic force in [the current stage of globalization] – the thing that gives it its unique character – is the newfound power for individuals to collaborate and compete globally. And the lever that is enabling individuals and groups to go global so easily and so seamlessly is not horsepower, and not hardware, but software – and all sorts of new applications – in conjunction with the creation of a global fiber-optic network that has made us all next-door neighbors. Individuals must, and can now ask, “Where do *I* fit into the global competition and opportunities of the day, and how can *I*, on my own, collaborate with others globally.” ...

...

... [W]e are entering into a phase where we are going to see the digitization, virtualization, and automation of almost everything. The gains in productivity will be staggering for those countries, companies, and individuals who can absorb the new technological tools. And we are entering a phase where more people than ever before in the history of the world are going to have access to these tools – as innovators, as collaborators, and, alas, even as terrorists. You say you want a revolution? Well, the real information revolution is about to begin. ...

...

It is not simply about how governments, business, and people communicate, not just about how organizations interact, but is about the emergence of completely new social, political and business models.

...

The introduction of printing happened over a period of decades and for a long time affected only a small part of the planet. Same with the Industrial Revolution. [The current] flattening process is happening at warp speed and directly or indirectly touching a lot more people on the planet at once. The faster and broader this transition to a new era, the more likely is the potential for disruption, as opposed to an orderly transfer of power from the old winners to the new winners.

Friedman also explored at length the trend of companies worldwide to break down manufacturing, production, service, and other processes and to farm out pieces to the places in the world in which they can be done the most cost-effectively. For example, many American firms – from computer companies to accounting firms – have begun to “outsource” tasks to English-speaking India, the Philippines, and other countries in which bright, well-educated, and

¹¹ T. Friedman, *The World is Flat: A Brief History of the Twenty-first Century* at 10-11, 45-46 (Farrer, Strauss and Giroux – New York – 2005).

highly-motivated young people will gladly perform these tasks for a small fraction of what it would cost the firms to have the work done in the United States.

China's surging economy is particularly threatening to America's traditional way of life. In his book *China, Inc.: How the Rise of the Next Superpower Challenges America and the World*,¹² Ted Fishman noted that China expects some three hundred million people to move from the countryside to major cities over the next 15 years. To accommodate this massive population shift, China will have to build the equivalent of Houston, Texas, *every month*, and its government will have to expand and accelerate its aggressive twenty-year-old program of encouraging importation of as many businesses and jobs from around the world as possible. The following passage from *China, Inc.* captures well the high stakes involved for the United States and the rest of the world:

The most daunting thing about China is not that it is doing so well at the low-end manufacturing industries. Americans will be okay losing the furniture business to China. In the grand scheme of things, tables and chairs are small potatoes in the U.S. economy. The Japanese, for their part, have lost the television business. The Italians are losing the fine-silk business. Germans cannot compete in Christmas ornaments. Everyone but the Chinese will lose their textile and clothing factories. More worrisome for America and other countries is the contour of the future, where manufacturing shifts overwhelmingly to China *from all directions*, including the United States. Consumer goods trade on the surface of the world's economy and their movement is easy for consumers to see. The far bigger shift, just now picking up steam, is occurring among the products that manufacturers and marketers trade with each other: the infinite number and variety of components that make up everything else that is made, whether it is the hundreds of parts in a washing machine or computer or the hundreds of thousands of parts in an airplane. And then there are the big products themselves: cars, trucks, planes, ships, switching networks for national phone systems, factories, submarines, satellites, and rockets. China is taking on those industries *too*.

With America's global leadership in manufacturing and commerce at risk, it is critically important for us to move quickly to retool our businesses, institutions and residents to ensure that we will continue to have a place at the head table in the world economy. In order for this to occur, the Institute of Electronic and Electrical Engineers (IEEE), a highly respected impartial professional organization, has suggested the following agenda stressing the importance of high-capacity fiber networks and the necessity of municipal involvement:¹³

A new generation of broadband, or "gigabit networks," can mean significant benefits to the United States, but our nation must act promptly to

¹² T. Fishman, *China, Inc.: How the Rise of the Next Superpower Challenges America and the World* at 14-15 (Scribner – New York, *et al.* – 2005).

¹³ IEEE-USA, *Providing Ubiquitous Gigabit Networks in the United States*, <http://www.ieeeusa.org/volunteers/committees/ccip/docs/Gigabit-WP.pdf>.

ensure that such an infrastructure is ubiquitous and available to all. If we do not act, the consequence will be to relegate the U.S. telecommunications infrastructure to an inferior competitive position, thus undermining the future of our country's economy. This issue demands the attention of policymakers as well as the public at large

...

The U.S. economy is based on knowledge — its creation, dissemination and application. A knowledge economy uniquely creates new wealth through invention and innovation. Development depends on research that depends on access to the entire body of existing knowledge and the rapid exchange of new knowledge throughout the economy and the society. Modern research typically retrieves, creates and exchanges massive information files at gigabit rates. After the research, many follow-on functions will benefit from gigabit networks, including computer-aided design; integration of design, manufacturing, sales, and distribution; and collaboration among all through high quality video conferencing.

...

Seamless and rapid communication permits easy access to all knowledge — scientific, medical, economic, commercial, educational, political and recreational. Through ubiquitous gigabit networks the entire U.S. population, urban and rural, could contribute fully to developing our nation's standard of living while overcoming a digital divide that now forecloses productive activity by those without such access.

...

Some regional telephone companies (Verizon and SBC Communications) and large cable system operators (Comcast, Time Warner and Cox) have current plans to deliver what they call "triple-play" (video, voice and data) services to selected markets. However, most of these efforts are not capable of serving as a component of a gigabit infrastructure. (All these firms propose residential access through copper-to-the-home except Verizon, which is working on fiber-to-the-home (FTTH) in the wealthiest counties within its operating area.) Further, none is capable of ubiquitous service to its customers, even in its service area. Rather, as quite appropriate to private sector corporations, each proposes service only "where profitable" (which Qwest, in its service area, has concluded is nowhere). Implicit in these business models is limited deployment that would aggravate, rather than eliminate, the digital divide.

...

...U.S. broadband networks badly lag behind those of many other countries. By one measure, 19 countries have broadband service superior to that of the United States. U.S. maximum public broadband capabilities by DSL and cable modem are in the range of 1 to 5 Mb/s downstream to the user, but generally 500 kb/s or less upstream. By contrast, most South Korean residents have access to 50 to 100 Mb/s, which in many cases is symmetric. South Korea achieved this infrastructure through a government policy supporting deregulation, competition and investment.

That policy jump-started its economy, especially in the information technology sector. Japan, likewise, adopted competitive policies leading currently to widespread 50- to 100-Mb/s symmetric capability and low prices. There is movement already to symmetric optical fiber networks connected to (as opposed to just passing) two million homes, with expanded gigabit availability to homes in 2005.

...

In Korea, penetration is in the neighborhood of 85 to 90 percent to businesses and 70 percent to individuals. In Japan, it is approaching 70 percent across the board. The literature also cites the advanced broadband capabilities of Sweden, Denmark, Taiwan, Hong Kong and Singapore.

The aforementioned countries achieved the high penetrations and high capabilities partly because of high population densities and short copper loops, conditions that are more favorable than those in the United States. *Nonetheless, these countries have set the bar and we must surmount it, if we are to maintain our current world lead in the creation and use of knowledge goods.*

Among IEEE-USA's specific suggestions of ways for America to stay abreast of the other leading nations are the following:

- Eliminate anticompetitive legal and regulatory challenges to the deployment of end-user owned networks
- Give municipalities that deploy gigabit networks broader access to such programs as the Rural Utility Service and the Universal Service Fund.

B. Only Fiber Systems Can Meet America's Foreseeable Bandwidth Needs

Not so long ago, when virtually all Internet users were restricted to dial-up connections of 14.4kbps, 28kbps, or 56kbps, the notion of a "broadband" service enabling an always-on Internet connection of 1Mbps, 3Mbps, or even 5Mbps was viewed as revolutionary. The reality, unfortunately, is that those broadband speeds, while certainly providing a more pleasant and efficient Internet browsing experience, have not fundamentally changed what most people do on the Internet. While it is true that users may now download short video clips and music, the Internet's true potential is hamstrung by such a limited capacity. The Internet provides the means to instantaneously deliver *and transmit* all manner of communications to and from anywhere in the world. High-definition and on-demand video, real-time multiplayer gaming, the transmission of enormous data files among businesses, and the deployment of innovative applications which do not yet exist, will *not* exist for consumers and businesses whose choice (if they are fortunate enough to have a choice) is limited to a service offering only a few megabits of capacity.¹⁴

¹⁴ In August of 2001, USA Today Science Correspondent April Holladay wrote an article about the differences in capacity for dial-up, wireless and fiber optics cable: "Think of the speed. Suppose you were to download the entire Library of Congress onto your PC using

In fact, to rely on a future involving anything less than a 100Mbps broadband capacity is to be truly shortsighted.¹⁵ The math is simple:

Bandwidth requirements for Broadband Services

Service	Bandwidth (downstream)
Broadcast TV (MPEG-2)	2 to 6 Mbps
HDTV (MPEG-4)	6 to 12 Mbps, per stream
PPV or NVoD	2 to 6 Mbps
VoD	2 to 6 Mbps
Picture in Picture (MPEG-2)	Up to 12Mbps
Personal Video Recorder	2 to 6 Mbps
Interactive TV	Up to 3 Mbps
High-speed Internet	3 Mbps-10 Mbps
Video conferencing	300 to 750 Kbps
Voice/video telephony	64 to 750 Kbps

Source: TR-094, broadbandtrends.com

The conclusion that America will soon need vastly more bandwidth than is currently available also finds support from numerous other knowledgeable sources. For example, in its most recent report to Congress on the status of deployment of advanced telecommunications networks, the Federal Communications Commission stated:

Providers assert that within the next several years, consumers can expect connections providing symmetrical service at 10 to 20 Mbps. Within five to ten years, these connection speeds should increase to 100 Mbps, and some providers

a dial-up modem transferring data at a rate of 56 thousand bps. It would take about 82 years. A wireless connection going at 2 Mbps would move the library in a little over two years. How long would a 3-trillion-bps fiber-optics connection take? 48 seconds." Quoted at http://www.iprovo.net/modules/xoopsfaq/index.php?cat_id=1.

¹⁵ See T. Mastrangelo, *How Much Bandwidth is Enough?*, Converge Network Digest, Oct. 14, 2005, <http://www.convergedigest.com/bp-ttp/bp1.asp?ID=263&ctgy=Market>.

predict that premium services may provide consumers with 1 gigabit per second (Gbps) access within a decade. Even higher-speed connections may be deployed to businesses, with some providers predicting the availability of 10 Gbps business services.¹⁶

Similarly, a study by Jupiter Research in 2005 concluded that, by 2009, average households will need 57-72 Mb/s of bandwidth and that “tech savvy” households will consume nearly 100 Mbps.¹⁷ A significant amount of this bandwidth will support in-home wireless applications, as well as high definition television and other bandwidth-rich applications. According to a leading industry journal, Jupiter’s research “provides justification for such technologies as FTTx, which can deliver that bandwidth to the home...”¹⁸

Another recent study, by Technology Futures, Inc., is of particular interest because it was funded and supported by the Bells. The study concluded that:

In the 2006 timeframe, a shift to much higher data rates in the range of 24 Mb/s to 100 Mb/s is likely to begin. So far, only a few places have access at these rates, notably Japan.

Leading broadband countries are a full generation ahead of North America. Japan and Korea are already rolling out the subsequent generation of services operating at 20 Mb/s and above, and have plans to complete the transition by 2010.”¹⁹

The difference between 100 Mbps and 5-10 Mbps is not simply about the ability to receive more data faster. It is, rather, an economically crucial difference that causes a profound shift in how the medium is used. In Japan, a recent academic study of the effects of widespread, near-symmetric 100 Mbps (as opposed to the passive, receiving-only model that dominates in the U.S. and elsewhere), found a dramatic increase in the use of peer-to-peer applications of various types, as well as in the number of “heavy hitter” users who take advantage of such applications.²⁰ In other words, affordable access to high-bandwidth capacity results in a surge of applications

¹⁶ FCC, *Fourth Report to Congress on the Availability of Advanced Telecommunications Capabilities in the United States* at 45, http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-04-208A1.pdf.

¹⁷ Jupiter Research, *Jupiter Research Predicts that Wireless Home Bandwidth Requirements Could Top 57 Mbps by 2009*, <http://www.jupitermedia.com/corporate/releases/04.11.04-newjupresearch.html>.

¹⁸ TelecomWeb, *Research House Foresees 100 Mb/s Homes by 2009* (May 8, 2005), <http://www.telecomweb.com/news/1099596358.htm>.

¹⁹ L. Vanston, R. Hodges, J. Savage, *Forecasts for Higher Broadband Bandwidth Needs*, http://www.tfi.com/pubs/r/r02004_broadband.html.

²⁰ K. Cho, K. Fukuda, H. Esaki, A. Kato, “The Impact and Implications of the Growth in Residential User-to-User Traffic,” February 11, 2006, <http://www.ijlab.net/~kjc/tmp/rbb-20060211.pdf>.

and of both content users and content creators that does not – and cannot – exist in an asymmetric, low-capacity environment.

There are two important lessons to be gleaned from the experience in Japan. The first is the crucial importance of robust *upstream* connections, enabling users to produce and distribute their own content and applications. The second lesson is that “big” broadband, as opposed to “baby broadband” of the kind that is available in the United States today, makes not only a quantitative difference, but also a crucial and economically significant qualitative difference.

These studies, and others like them, underscore the importance of fiber systems to America’s future, including its wireless future. Today, fiber is the only proven technology that can allow network connections exceeding 100 Mbps. In fact, the inherent, virtually unlimited capacity of optical fiber makes the network relatively “future-proof.” It is this tremendous capability that permits fiber networks to transmit voice, enormous data files, and multiple streams of video simultaneously. Applications such as distance-learning, health-care monitoring, and unlimited video-on-demand, which were once far out-of-reach, are easily accessible with FTTU.

The following table provides a concise illustration of the dramatic difference of services enabled by a FTTU system, comparing a potential public FTTU project with currently available offerings:

Categories	Public FTTU	Bellsouth DSL	Comcast HFC	DBS DISH	Wireless Hotspot
Bandwidth Download	Unlimited	<6 Mbps	<3 Mbps	< 45 Mbps	<11 - <54 Mbps
Bandwidth Unload	Unlimited	<512 kbps	<256 kbps	<64 kbps	<11 - <54 Mbps
VOD	Yes	Limited	Limited	No	No
VOIP	Yes	Yes	Yes	Yes	Yes
HDTV	Yes	Limited	Yes	Yes	No
DVR	Yes	Yes	Yes	Yes	No
High Speed Internet	100+ Mbps	<6 Mbps	<3 Mbps	<512 kbps	<11- <54 Mbps
HDTV 4 channels	Yes	No	Yes	Yes	No
Telephony with QOS	Yes	Yes	No	No	No
Gaming	Yes	No	No	No	No
Future Applications	Yes	?	?	?	?

Other cities and nations around the world have recognized the importance of deploying a future-proof network infrastructure, and they are aggressively making it happen. For example, earlier this year, the City of Amsterdam announced a project to deploy FTTU throughout the

city.²¹ Shortly afterward, the Mayor of Paris, France, announced the goal of deploying FTTU throughout “all of Paris.”²² A few weeks later the City of Vienna, Austria, announced plans for a citywide FTTU network that will provide residents 1 Gbps of symmetrical broadband capacity.²³

Municipalities that have FTTU systems stand out in the global economy and have a much greater chance of achieving the benefits listed above than communities that do not have such systems. As a result, municipalities have been at the forefront of FTTU deployments in the United States. Municipalities have for years accounted for more than 30 percent of all homes passed by FTTU systems and of nearly 50 percent of homes passed in large projects of at least 2000 homes.²⁴

C. Incumbent Providers Are Not Likely to Meet Future Bandwidth Needs

Unless cities in Tennessee take matters into their own hands, they are not likely to obtain the bandwidth capacity that the experts predict they will need in the years ahead. There is simply no reason to believe that the incumbent communications providers will deploy sufficient bandwidth capacity in the foreseeable future, if ever.

1. BellSouth

BellSouth has no intention of overbuilding its territory with FTTU.²⁵ While there are isolated reports of pilot projects and occasional “greenfield” fiber deployments, BellSouth’s clear strategic position for the future is *not* based on deploying FTTU but on using its existing copper infrastructure to provide broadband service using ADSL2+ technology for the last mile.

Although BellSouth took an early lead among the Bell companies in introducing fiber into its system, it is now far less aggressive than Verizon and SBC (now known as “AT&T”) in deploying fiber to consumers: “The company’s plan to focus its capital strategy on improving DSL’s availability and bandwidth stands in contrast to the plans of its ILEC brethren, SBC

²¹ “Amsterdam Fires Up Muni Broadband,” *Light Reading*, January 5, 2006, http://www.lightreading.com/document.asp?doc_id=86384.

²² “Paris Plans FTTH Network,” *Light Reading*, January 9, 2006, http://www.lightreading.com/document.asp?doc_id=86547.

²³ “Vienna Plans Fiber Optics for Everyone,” *Heise Online*, January 27, 2006, <http://www.heise.de/english/newsticker/news/68912>.

²⁴ Conversations with Michael Render, whose firm Render Vanderslice & Associates maintains and frequently updates a database of fiber to the home deployments across the United States. His reports are often summarized by the FTTH Council, <http://www.ftthcouncil.org> and the Telecommunications Industry Association, www.tiaonline.org.

²⁵ C. Wilson, “Ackerman Paints Picture of Cautious Aggression,” *Telephony Online*, Jan. 11, 2005, <http://bg.telephonyonline.com/microsites/newsarticle.asp?mode=print&newsarticleid=2737699&releaseid=&srid=11357&magazineid=7&siteid=3>.

Communications and Verizon Communications, which will spend the next few years and billions of dollars deploying fiber deep into their networks.”²⁶

Even assuming (contrary to fact) that BellSouth were going to deploy ADSL2+ everywhere in its service area immediately,²⁷ such a deployment would still fall short of meeting predictable bandwidth demand. The reason is that, even under ideal conditions, ADSL2+ has maximum bandwidth capacity of only 21-24 Mbps downstream and 1-3 Mbps upstream. That is below the range of 24-100 Mbps that the Bells’ own supported research, by Technology Futures, Inc., predicted that U.S. households would begin to reach by 2006, and it is far below the bandwidth levels that even average homes, let alone “tech-savvy” homes, will need by 2009.

2. Comcast

Cable companies currently offer bandwidth in the single-digit Mbps range, with some isolated exceptions. The companies claim that they have no plans to make widespread boosts in their bandwidth capacity. At most, they say, they may match the speeds offered by the telephone companies.²⁸

Comcast, specifically, has no apparent plan to deploy FTTU or an equivalent service. In fact, Comcast CEO Brian Roberts recently ridiculed Verizon’s FTTU efforts, saying “I think it does not show any economic promise.”²⁹ Comcast and the rest of the cable industry appear to be relying on the existing hybrid fiber-coax (HFC) network architecture for the future. The industry generally hopes that software advances and changes to DOCSIS cable transmission standard will enable greater use of HFC plant. Unfortunately, even the optimistic prognosis of HFC capacity using the next-generation DOCSIS 3.0 is 100 Mbps, and that has only been proven in a laboratory setting thus far.

A second key point is that cable, by virtue of its architecture, is a shared system. Thus, individual users are not likely to see anywhere near the maximum capacity of cable systems, particularly at times of peak usage. FTTU, by contrast, can enable at least 1 Gbps in both downstream and upstream, and is, for all practical purposes, unlimited.

²⁶ D. O’Shea, “BellSouth looks toward next-gen DSL,” *TelephonyOnline*, December 13, 2004, http://telephonyonline.com/ar/telecom_bellsouth_looks_toward/.

²⁷ The Bell companies “are taking a ten-year-plus view” for next-generation deployments. See D. Koenig, “Verizon, SBC find TV Venture a Tough Go,” *Associated Press* (May 31, 2005), http://www.attretirees.org/Articles/Archive%202005/ap_5-31-05.htm.

²⁸ See, e.g. M. Reardon, “Cablevision: We’re not afraid of Verizon’s fiber,” *ZDNet News* (May 5, 2005), http://news.zdnet.com/2100-6005_22-5696942.html; K. Leonard, “Verizon Speeds Internet Service,” *Pittsburgh Tribune-Review* (May 5, 2005), http://pittsburghlive.com/x/tribune-review/business/s_331091.html.

²⁹ P. LaMonica, “Comcast Talks Tough About Telecom Threat,” *CNNMoney.com* (February 8, 2006), <http://money.cnn.com/2006/02/08/news/companies/comcast/>.

II. MUNICIPAL FIBER-TO-THE-USER IS A RATIONAL OPTION

Municipalities have long provided for their own needs for water, sewer, gas, electricity, transportation systems, airports, hospitals, educational and occupational programs, and numerous other necessities and amenities that the citizens of the municipality have deemed appropriate. They have also proven that they can operate highly sophisticated systems as well as, if not better than the private sector, and at lower cost.

Municipalities are not primarily motivated by the desire to make a “profit,” as that term is understood by Wall Street, but by the need to meet important needs of the community. Chief among these are enhancing economic development, educational and occupational opportunity, access to affordable health care, digital equity, public safety, homeland security, environmental protection, efficient government service, cultural enrichment, and all of factors that contribute to a high quality of life. A public FTTU system can contribute to the fulfillment of each one of these goals.

To be sure, a public FTTU system is certainly not appropriate for all cities or for all circumstances, and no municipality would rush into such a project. But in many situations, particularly where a public power utility would develop and operate the system, the deployment of a public FTTU network can be a rational, prudent, and wise decision for the betterment of the community.

A. Municipal FTTU Systems Can Be Successful in Some Situations in Which the Private Sector Cannot

Opponents of municipal broadband initiatives contend that public broadband projects are “failures” if they do generate “profits” in the amounts, and within the short time periods, that investors and the financial community expect of private corporations. To define success this way is to miss two fundamental points: (1) public entities have fundamentally different ways of creating economic benefits for the community than the private sector; and (2) municipalities often undertake a public communications initiative precisely because the project would not be profitable enough for a private company.

1. A municipal broadband system creates economic value in many ways other than user fees

The objective of a private-sector, profit-driven provider of communications services is, naturally, to produce a profit, primarily from customer fees. The *sole* duty of a profit-driven entity is to maximize the value of the company to its owners, by generating substantial profits over a relatively short period of years. That is certainly not a bad thing. To the contrary, it is essential to a capitalistic economy that private companies behave this way. The bottom line of a profit-driven company, however, is not directly enhanced by the benefits that a community may derive from the fulfillment of the community goals enumerated above. Such considerations are simply not part of the equation for the decisions made by the company.

Municipal broadband is different, and the differences between public and private providers are all but ignored in opponents' critiques of municipal broadband. A community's decision to deploy a broadband network is driven by several important objectives other than the Wall Street metric of making a profit from user fees for services. User fees are only a part of the equation. The value of a modern, robust communications system to a community should also take into account the economic stimulation that the network enables, including jobs and businesses created or retained; increased income; increased spending; increased property values; increased educational achievement; more cost-effective government service; etc. All of these have real and significant monetary effects on a community. For example, consider the economic benefits that a new high-paying job contributes to community – or the economic burdens that the loss of such a job will cause in the community.

There is a massive amount of information linking municipal broadband investments to business attraction and retention, high salaries, and growth of the local economy. This includes several recent studies and hundreds of first-hand experiences of municipal officials to whom companies have said that the presence or absence of an advanced communications network was a significant factor in the company's decision to move to, stay in, or leave, a community.

In one of these studies, Applied Economic Studies (AES) performed a rigorous econometric comparison of the economic development of Lake County, Florida, and the economic development of several comparable counties in Florida, in the period after Lake County began to offer municipal broadband service widely throughout the County.³⁰ AES corrected for population growth and other variables that could distort the data. AES concluded:

Our findings are consistent with other analyses postulating that broadband infrastructure can be a significant contributor to economic growth. The Bureau of Economic Advisors (along with others) has stated that broadband infrastructure confers positive, public benefits on the economy, and our results provide support for presence of large external benefits from communications networks.³¹

Similarly, a study of the benefits of a FTTU deployment in Hamilton County, Tennessee, estimated that benefits from the system *not* attributable to user fees would amount to \$251.8 million, or 42 percent of the total benefits to the county.³²

Another highly instructive study is the economic impact study of the municipal fiber network in South Dundas Township, Ontario, which cost \$750,000 initially and for which the total investment by the Township was \$1.3 million. The study found that, over a two-year period, the following economic effects could be directly attributed to the network:³³

³⁰ G. Ford, T. Koutsky, "Broadband and Economic Development: A Municipal Case Study from Florida," *Applied Economic Research* (April 2005) ("AES Lake County Study"), <http://www.aestudies.com/library/econdev.pdf>.

³¹ *AES Lake County Study* at 15.

³³ "Economic Impact Study of South Dundas Fibre Network," Strategic Networks Group, June 27, 2003, <http://www.aestudies.com/library/econdev.pdf>.

- 62.5 new jobs
- \$2.8 million in commercial / industrial expansion
- \$140,000 in increased revenues and decreased costs

As a result of these direct effects, the following indirect effects were predicted:

- \$25.22 million increase in GDP for Dundas County and \$7.87 million increase for the Province of Ontario
- 207 person years of employment for Dundas County and 64 for the rest of Ontario
- \$3.5 million increase in provincial tax revenues and \$4.5 million increase in federal tax revenues.

In short, municipal broadband networks create significant economic value for all concerned, and their measure of value goes well beyond user fees. The betterment of the community, economically and otherwise, is a significant part of the return on investment, and is an important part of the decision-making equation for municipalities. As a result, municipalities can fund and operate FTTU systems on a long-term basis, focusing on recovering costs over the life of the systems.

Private sector companies have completely different goals, driven by shareholders' and the financial community's demand for high, near-term profits from user revenues.³⁴ In the face of this reality, it is completely inappropriate to use of conventional Wall Street metrics to judge whether a municipal project is successful. The metric for success certainly should not be: "If this were a private firm, would Wall Street like it?"

Indeed, many municipal broadband projects are undertaken *because* the Wall Street metric does not work. The town may be too remote, the population may be too sparse, or the demographic nature may not be consistent with the template used by private sector companies in their profit-maximizing decisions on where and whether to deploy. Those are precisely the circumstances, however, in which the community benefits of providing broadband become most profound, and most valuable.

In short, because municipalities can take a long-term approach to fulfilling the community's needs, they can often make a successful business case for a project that a profit-driven private entity would not even consider.

2. For most FTTU projects, it is too soon to pass judgment.

Opponents of municipal broadband often make judgments about systems that are still very much in their infancy. These opponents would surely be less critical in judging private projects that had been in existence for similar periods.

³⁴ "These positive externalities are unlikely to be considered by private providers when making FTTH deployment decisions." Lobo, Novobilski & Gosh, "The Impact of Broadband in Hamilton County, TN."

In fact, the Tennessee Comptroller of the Currency acknowledged as much in a June 2005 report favoring municipal broadband projects in Tennessee:

Of the five systems that are actually providing services authorized in the 1999 legislation, none have been fully operational longer than three years. These systems are Chattanooga, Columbia, Covington, Fayetteville, and Jackson Energy Authority. Similar to any enterprise operation, a period of time should be allowed for the system to be constructed, customers to be recruited, and initial start-up costs to be absorbed before any conclusions can be made regarding the ultimate financial success of these operations. With regard to the systems which are providing cable/internet services, their original plans indicated it would take from two to ten years before a system would reach its break-even point: the point at which current operating revenues are sufficient to meet costs of operation, including depreciation and debt service on all debt obligations.³⁵

3. Examples of Successful Municipal Fiber Projects

While it is still early in the life of most municipal FTTU projects, a number of projects have now had enough experience to support the preliminary conclusion that such projects can be successful, not only when judged by the standards that apply to public entities, but even when judged by the standards that apply to the private sector. Some examples follow.

a. Jackson, Tennessee

In Jackson, Tennessee, business and consumer leaders believed that the private telecommunications and cable companies were not acting swiftly enough to offer advanced services, and that this was causing Jackson to lose business opportunities to other communities. The Jackson Energy Authority (JEA), a hybrid municipal and public utility, had reached a similar conclusion, and it determined that a FTTU network could be a key driver for the local economy and could ensure that consumers would have access to advanced data and video services. JEA began construction in early 2004 with and had its first customers by May.

The network is open to competitive providers of telecommunications and data services. Customers can receive (a) from two competitive local exchange carriers, up to 4 VOIP telephone lines and internet access service at speeds ranging from 512 kbps to 10 Mbps (with the potential for 40 Mbps), and (b) from JEA, 270 all-digital channels of cable television. The network currently serves over 11,500 customers and passes more than 30,000 homes and business in greater Jackson next year. This is currently the largest in-service FTTU network in the U.S., and the citizens of Jackson have a major attraction for new businesses as well as real competitive choices for telecommunications and cable services.

35 *Report on Tennessee Municipal Electric Systems Authorized to Provide Cable and Internet Services*, Comptroller of the Treasury, State of Tennessee, June 30, 2005, at 4, http://www.comptroller.state.tn.us/1f/1freport_June05.pdf.

b. The Dalles, Oregon

The Dalles, a city of 11,873 in the picturesque Columbia River Gorge, operates a 17-mile municipal fiber optic network. In 2004, The Dalles received \$200,000 in federal economic development and infrastructure funds to complete the network and connect it to NOANet (Northwest Open Access Network), a cooperative that uses fiber owned by the Bonneville Power Administration to operate a statewide telecommunications network linking schools, hospitals, government agencies and businesses. The Dalles project was viewed as “laying the technical foundation needed to promote economic growth in Wasco County.”³⁶

As a direct result of The Dalles’s municipal networking capabilities, Google in 2005 decided to purchase an industrial site in The Dalles for \$1.87 million, to house high-tech equipment that would be connected to the rest of the company’s network. In doing so, Google “is expected to bring to the Columbia River Gorge community between 50 and 100 jobs paying an average of \$60,000 annually in wages and benefits, twice the county’s average income.”³⁷

c. Bristol, Virginia

In Bristol, Virginia, the municipal utility, Bristol Virginia Utilities (BVU), first deployed a fiber-optic network in 1999 to commercial and public sector entities (such as schools and libraries) to help fuel the town’s economic development and provision of services to its citizens. The decision to invest in an advanced all fiber-optic network – rather than in a traditional hybrid-fiber coax network – proved prescient. While the first-installed costs of the fiber network were 15% higher than they would have been for an HFC network, the fiber network could deliver the full suite of broadband applications with greater robustness and flexibility. As a result, citizens of Bristol in 2001, seeing the tremendous benefits of the services provided over the fiber-optic deployment to businesses and government, made it clear to BVU that they wanted a FTTU network throughout Washington County.

After overcoming extensive efforts by the incumbents to thwart the project, which had significantly delays and needless costs, BVU began offering the “triple-play” package over the new FTTU network in July, 2003. By the middle of 2004, BVU had a penetration rate exceeding 40%. Today, the Bristol’s penetration rate exceeds 60 percent, and it is viewed as an engine of economic development for the entire region of Southwest Virginia. For example, as Congressman Rick Boucher (D-VA) recently reported, the Bristol FTTU was instrumental in attracting more than 700 jobs to a single site in Russell County, VA, and Bristol is now expanding the system to Buchanan, Dickenson, Lee, Tazewell and Wise counties, which currently do not have access to such services.³⁸

³⁶ “Senators Secure Economic Development Dollars,” *Bend.com* (January 22, 2004), http://www.bend.com/news/ar_view.php?ar_id=13325.

³⁷ “Port Deal With Google to Create Jobs,” *Gorge Business Journal* (February 14, 2005); <http://www.gorgebusiness.com/2005/google.htm>.

³⁸ <http://www.boucherforcongress.com/pressroom.asp?artID=58>.

Critics of the Bristol system sometimes observe that its operating expenses increased 148% from 2002 to 2003, and 67% from 2003 to 2004. But the criticism fails to tie those increases to the revenue increases that the system's expense-generating activities caused. Those revenue increases were 84% from 2002 to 2003 and 517% from 2003 to 2004. When viewed in a more useful light, from 2002 to 2004, the system's revenues increased by 1035% while its expenses only increased by 314% -- a very impressive performance. Furthermore, the Bristol system is now EBIDTA positive and has exceeded its EBITDA projections in three of its last four years.³⁹

In fact, demand for the BVU service is so high that the utility is having difficulty keeping up. More than 1,000 individuals and businesses requested service during a single fiscal quarter in 2005, while utility officials had projected 1,600 new connections for the entire year. "It's a good problem to have," said BVU General Manager Wes Rosenbalm in a December, 2005 news report.⁴⁰ "They're not all installed yet. We haven't been able to keep up with the demand, but we expect to fill those orders soon."

As further evidence of the positive impact that BVU's network has had on its community, its cross-border sister city, Bristol, Tennessee, has followed suit with its own FTTU deployment, making the combined cities one of the most dynamic small towns in American.

d. Reedsburg, Wisconsin

Reedsburg is a small town (population of about 8,000) in Wisconsin. Several years ago, Reedsburg Utility Commission (a municipal utility for over 100 years) determined that deployment of a FTTU network – the first in Wisconsin – offering voice, high-speed internet access, and video services would be, in the words of its Superintendent Dave Mikonowicz, “an excellent investment in our community's economic development and quality of life.” The Utility initiated construction in 2002 of a state-of-the-art FTTU network, began acquiring its first customers in 2003, and by late 2004 had over 1000 customers (about a 25% penetration rate). Today, construction is largely complete, and the subscriber base continues to grow – approaching 2,000 customers. Again, in the words of Superintendent Mikonowicz, “Being a technologically advanced community is a key attraction to both residential and business prospects. Not only is the technology enhancing and enriching the quality of life of current residents and businesses, but it will continue to support our needs well into the future.”

e. UTOPIA, Utah

One of the best-known municipal FTTU deployments in the country is the Utah Telecommunications Open Infrastructure Agency (“UTOPIA”), a consortium of 14 Utah cities.

³⁹ When judging and comparing private-sector communications providers, industry analysts typically use a standard known as "EBITDA" - Earnings, Before Interest, Taxes, Depreciation and Amortization. <http://www.investorwords.com/5534/>

⁴⁰ “Virginia Awash With Broadband Options,” *Broadband Reports.com* (December 14, 2005), <http://www.dslreports.com/shownews/70354>.

They have banded together to create an all-fiber network to deliver cutting-edge services to their citizens and businesses, enhancing the quality of life and boosting their economies. The network will serve about 170,000 homes and businesses when completed. (The first phase of construction will soon be completed.) Even during construction, UTOPIA has begun to provide wholesale services and has signed a variety of retail providers to sell voice, internet access, and video services.

“We are extremely encouraged by the progress the UTOPIA Community Metronet has experienced thus far,” says Roger Black, UTOPIA’s chief operating officer. “Take rates from businesses and residential customers to date have exceeded our expectations, and construction and customer service are proceeding apace.”

UTOPIA has received several calls from businesses looking to relocate to UTOPIA member cities. The reason, the businesses often state, is to have access to the ultra high-speed Community Metronet. Many of these businesses are data-intensive. They rely on processes and critical applications that require “big” bandwidth. These businesses want to save money and connect to a reliable and secure network.

UTOPIA compares its business model to that of operating a public airport. Municipalities own and operate airports, but airlines are the service providers. When passengers buy airline tickets, a portion of each fare is returned to the municipality, which is then used to pay operational costs and retire revenue bonds. In other words, only those who use the service pay for it.

III. A CLOSER LOOK AT SO-CALLED “FAILURES”

There are now more than 600 public entities providing communications services of some kind, and hundreds more are developing or considering the development of public networks to do so. Out of all these projects, there are surely some that Wall Street would not deem “successful.” Pointing to a small handful of examples – over and over again – opponents of public broadband initiatives suggest that these “failures” prove that all public broadband initiatives are, or will be, failures. A close look at these examples not only belies the claims of “failure” in individual cases but also seriously undermines the broader claims that the opponents base on them.

1. Marietta, Georgia

Claim:

Opponents of municipal broadband often claim that the municipal telecommunications network in Marietta, Georgia, is the “poster child” of a municipal failure. This claim is based on the fact that the City paid \$35 million for the system and eventually sold it for \$11.2 million, which critics interpret as causing a loss of \$24 million on the project.

Response:

The myth that Marietta was a failure has its roots in an article published in the Atlanta Journal-Constitution on July 29, 2004, suggesting that Marietta "lost" \$24 million and then sold out to avoid any further losses. The author arrived at the \$24 million figure by simply subtracting the City's selling price, \$11.2 million, from its investment in the system, \$35 million. This was obviously wrong and misleading on its face, as the author did not take into account the millions in annual revenues that the system generated over the years.

Furthermore, Marietta FiberNet had not only been running EBITDA-positive every year since 2001,⁴¹ but it was on track to go fully into the black in the first quarter of 2006. Thus, according to the standards that analysts typically apply to the private sector, Marietta FiberNet was a success, not a failure. American Fiber Systems certainly did not consider it a failure. To the contrary, it hired 100% of the system's management and staff to continue to do exactly what they had been doing before the sale.

What really happened in Marietta is that the mayor at the time of the sale had run three years before primarily on the promise that, if elected, he would get the City out of the telecom business. At the time, the system was still in its adolescence, and it had several years of projected losses to go before reaching the promising position that it was in at the time it was sold. After winning the election, the mayor made good on that promise. Reasonable minds may differ as to whether the City received full value for the system, but one thing is certain – the system would surely have been much more successful and valuable if it had not been forced operate under a dark cloud for the previous three years.

In any event, Marietta FiberNet was a not fiber-to-the-home system of that kind Chattanooga EPB is considering. Marietta FiberNet did not offer the "triple play" or even serve the residential market. Rather, it only offered broadband and telecommunications services to businesses in Cobb County, Georgia, a thriving area just northwest of Atlanta, and in some areas of Atlanta itself. Several private-sector firms were offering similar services in these markets. Thus, it is questionable whether Marietta's experience provides much, if any, useful guidance for a municipality contemplating a FTTU system.

2. Ashland, Oregon

Claim:

Pointing to the City of Ashland's candid self-assessments of the difficulties that the Ashland Fiber Network (AFN) has encountered, critics have claimed that AFN is another municipal failure.

⁴¹ For an explanation of EBITDA, see n.39.

Response:

AFN, like many telecommunications companies in business at the time, struggled through the dot-com crash as several its major customers failed. In addition, Ashland's accounting system also allocated costs to AFN that could legitimately have been allocated to other utilities, which made AFN's performance look considerably worse than it really was.

AFN was also the victim of discriminatory pricing by the incumbent cable provider, Charter Communications. For a sustained period of time, Charter was offering a popular cable television package in Ashland for \$24.15 a month, while offering the same package for \$45.99 per month in surrounding communities that did not have a city-owned communications system. When the media caught on to Charter's practices, the Western Division Vice President immediately claimed that the corporate office had been unaware of the local system's pricing, stated that \$24.15 rate should have been a short-term promotion rather than a long-term rate, and told the reporter that "We are no longer going to offer that rate as of tomorrow, or when your article comes out."⁴²

As a result of competition with the incumbent cable provider, Charter Communications, the citizens of Ashland have saved nearly \$2.4 million in recent years in lower cable rates.

4. Tacoma, Washington

Claim:

Critics of the Tacoma, Washington Power Utility's Click! Network, focusing solely on the communications services offered to the public, claim that the project has resulted in an operating loss of over \$15 million.

Response:

Critics of Tacoma's Click! Network usually refer to a discredited report that mistakenly allocated all of the costs of Tacoma's system to its cable unit, when in fact most of Tacoma's infrastructure was built to serve core utility functions. In other words, the Click! Network was constructed primarily for the utility's use, and would have been built whether the utility deployed communications services or not. When costs are appropriately allocated, Tacoma has been communications unit has had positive cash flow and EBITDA every year since 2001.

Tacoma, Washington's Click! Network is operating in the black and has not resulted in a tax hike. The municipal broadband utility is alive and well and making money. According to the Washington Public Utility Board, the Tacoma City Council, the Tacoma Pierce County Chamber of Commerce, the Economic Development Board, The Tacoma News Tribune and thousands of residential and business customers, Click! Network is a huge success.

⁴² V. Aldous, "Cable Wars," *Ashland Daily Tidings* (March 3, 2005), <http://www.dailytidings.com/2005/0303/030305n1.shtml>.

The Click! Network is another example of a highly successful municipal project that has enabled Tacoma to attract or retain scores of businesses and has caused cable rates in Tacoma to be much lower than they would otherwise have been. Even Comcast has grudgingly acknowledged that competition from the Click! Network has been good for all concerned, including Comcast itself.⁴³

One news report noted, “[c]onnectivity is the key to Tacoma's recent business growth. More than 100 high-tech companies have set up shop in the South Puget Sound city in Washington since the launch of the city owned and operated Click! Network.”⁴⁴ In an extensive interview in *Business Facilities Location Advisor*, the president of one of these businesses confirms that the decisive factor in the company’s decision to locate in Tacoma was Click!’s ability to provide the fiber that the company required.⁴⁵

5. Cedar Falls, Iowa

Claim:

Critics allege that the Cedar Falls, Iowa municipal broadband system is perennially running a negative free cash flow, among other charges, and that the system is therefore a failure.

Response:

The suggestion that the Cedar Falls system has failed is utterly ridiculous. The Cedar Falls communication utility, approved by a 70% vote in a 1994 referendum, launched cable service in 1996 and high-speed data service in 1997. It had positive operating earnings for the first time in 1998 and has posted positive net income since 2003. No tax dollars have ever been used to fund the communications utility.⁴⁶

Contrary to what the attacks say, the Cedar Falls communications utility is in sound financial condition, earning net income of more than \$1 million per year. The utility borrowed money both for initial construction and to fund major plant expansions, and has made all debt payments on time. The utility sets its rates as low as possible while covering operating expenses, ongoing plant improvements and debt payments. It is on track to pay off outstanding long-term debt five years ahead of schedule, by the end of 2011.

⁴³ Mr. Kipp’s quotation appeared in an article that was online at <http://www.tribnet.com/news/local/story/3146162p-3170300c.html>. That link is no longer active. The article was quoted contemporaneously in <http://www.dslreports.com/shownews/28553> and <http://wifinetnews.com/archives/004779.html>.

⁴⁴ R. Starner, “Wired Cities,” *Site Selection Online* (January 2001), <http://www.siteselection.com/issues/2001/jan/p43/>.

⁴⁵ K. Kahn, “Getting Enough Fiber in Tacoma, WA,” *Business Facilities* (February 2002), http://www.businessfacilities.com/bf_02_02_move.asp.

⁴⁶ “The Truth About Cedar Falls Municipal Utility,” <http://www.iowamunicipals.com/cedarfalls.asp>.

Furthermore, Cedar Falls has had a tremendous beneficial impact on the community's economic development, particularly when compared to its next door neighbor, Waterloo, Iowa. A 2003 study comparing Cedar Falls and Waterloo, Iowa, which has only private broadband providers, reported that Cedar Falls set a record for construction investment in 2002—over \$100 million despite an economic downturn. Meanwhile, Waterloo suffered its lowest total in eight years, coming in at \$53 million. Since the City completed its advanced communications system, business growth and new construction in Cedar Falls has boomed, bringing hundreds of high-paying jobs to the area, while at the same time, the economy of Waterloo has lagged far behind. This history is very well documented.

6. Acworth, Georgia

Claim:

The debt incurred by the Acworth, Georgia municipal cable system fell back to taxpayers, resulting in a \$40 tax increase on a \$200,000 home.

Response:

At the outset, the City of Acworth does not have a fiber-to-the-home system, nor does it offer the triple-play of voice, video and data services. Thus, Acworth offers little information that may be relevant to Chattanooga.

In any event, Acworth deployed one of the early municipal cable systems, long before Comcast acquired several cable systems in the Atlanta area, including the private system in Acworth. Today, Acworth's system offers little or no competitive advantage over Comcast in terms of broadband speed, television offerings, or rates, and it lacks Comcast's massive resources, pervasive marketing, and dominance of the cable business in the Atlanta area. Acworth's story perhaps best underscores the point that municipal officials should focus on offering services that fill compelling community needs and are not likely to be duplicated in the foreseeable future.

III. CONCLUSION

To stay competitive in the emerging global economy, America greatly needs a prompt and widespread upgrade of its advanced telecommunications infrastructure. The major incumbent telephone and cable companies cannot do this alone. In similar circumstances a century ago, when electric power was the must-have technology of the day and the private electric companies could not electrify America quickly enough, thousands of municipalities stepped forward to meet their communities' own needs. Now, hundreds of progressive municipalities are ready to help themselves in the broadband area. As shown in this paper, the pioneering public FTTU systems have generally performed well, and the criticisms that opponents of such systems are largely baseless and unpersuasive. Moreover, from each valid criticism there are important lessons to be learned.