

## Financial Implications of Opelika's Municipal Broadband Network

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### Introduction

Beginning in 2013, the city of Opelika, Alabama, became the state's first "Gig City," offering broadband Internet services to its 11,000 households over a \$43 million fiber-optic network constructed and operated by the city's electric utility, Opelika Power Services ("OPS").<sup>1</sup> Opelika is not alone—across the nation a few hundred cities have built their own broadband networks in an attempt at economic relevance in modern times.<sup>2</sup> In recent years, growth of the phenomenon has slowed, in part due to the shortage of federal subsidies these networks typically require and in part due to the numerous and often spectacular financial and management failures of these government-owned networks ("GONs") in cities like Provo-Utah, Burlington-Vermont, Bristol-Virginia, and Groton-Connecticut.<sup>3</sup>

How is Opelika's system doing financially? According to Mayor Gary Fuller, the city's network, in its fourth year of operation in 2016, is "on pace with our five-year plan to be at break even."<sup>4</sup> As explained in this PERSPECTIVE, this rosy assessment is entirely at odds with the city's own books. The city's telecommunications service has experienced large and continuing financial losses through 2016, accumulating millions in financial losses during its four years of operation. Before "break even," these millions in losses must be recovered and the \$42 million in debt paid.

In this PERSPECTIVE, I conduct an analysis of the OPS broadband network's financial health using

the city's financial statements.<sup>5</sup> To date, the City of Opelika has borrowed \$42 million for its broadband network, lost nearly \$14 million providing broadband services, and raised electric rates by \$5.39 per customer to subsidize the financial losses from its broadband network. These are all huge burdens for such a small, lower-income community. Opelika's financial losses are predicted to mount through 2020, at which time the network will continue to lose money on an annual basis and will have accumulated losses of nearly \$19 million. By any meaningful financial metric, OPS's broadband network is unlikely ever to be "profitable."

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### Background on Opelika's Network

High-speed Internet services are considered by many to be essential to economic development in the modern economy. Smaller cities

struggling in the information economy see the lack of the latest broadband technology as a key, if not only, handicap to success. Consequently, some cities have taken on the substantial financial risk of constructing and operating their own broadband networks, often in direct competition with private companies. Opelika, Alabama, is one such city.

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The City of Opelika engages in a number of "Business-Type Activities" including the provision of electricity, sewer services, garbage collection, and now telecommunications services. Operating an electric utility provides some advantages to the city's broadband network—it has employees that know about network construction and customer service, as well as having assets that might be shared between the two technologies.

A municipal electric utility offers another key advantage to a broadband upstart—profits. In 2010, the electric division produced annual operating profit for the city of about \$5.5 million. As is typical of cities operating electricity and broadband networks, Opelika has shifted no small part of the costs of the broadband network on to its highly-profitable electric division, thereby hiding the financial losses of the broadband service from plain view through an internal cross-subsidy scheme.

Opelika expected the broadband network to cost the city \$43 million.<sup>6</sup> The city initiated the construction of the network in 2011 when the electric utility (not the telecommunications division) borrowed \$28.1 million. The revenue to finance the annual interest payment of \$1.44 million, as well as the expenses and depreciation from the assets acquired with those funds, comes from the captive electric ratepayers.

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This first loan is a sizable sum for a city of about 11,000 homes. Mayor Fuller has attempted to assuage worries by noting that the city's Aa3 bond rating implies "the deployment of the FTTH network has not adversely affected the financial condition of the city."<sup>7</sup> What the mayor fails to mention is that the debt for the broadband network is secured by a first lien on the net revenues of the electric system, not the city.<sup>8</sup> In 2014, Moody's downgraded the bond rating of the city's electric utility (on the \$28 million bond) from Aa3 to A1 to reflect the utility's "financial support of the city's relatively new telecommunications enterprise and the long-term risks posed by exposure to the sector's competitive market forces."<sup>9</sup>

The effect of shouldering the debt for the broadband network on captive electric ratepayers has already affected power rates in Opelika. In 2015, for instance, OPS raised its electricity rates to cover a \$0.8 million revenue shortfall for its electric division.<sup>10</sup> The loss equaled a little over half the annual debt expense the electric division shoulders for the

interest payments of the electric division. Perhaps intentionally, this mixing of the financials of the electric and telecommunications division makes it difficult to see clearly the financial impact of the broadband network. Nevertheless, a full accounting of the finances of the broadband network can be approximated. I do so by constructing a counterfactual of the

**Table 1. Financial Analysis of Opelika’s Broadband Network**

	2012	2013	2014	2015	2016
<b><i>Electric + Broadband</i></b>					
Revenues	35,271,849	34,131,980	40,218,323	44,874,861	47,001,981
Expenses	<u>30,950,669</u>	<u>32,591,461</u>	<u>41,466,152</u>	<u>43,459,692</u>	<u>43,549,454</u>
Income (loss)	4,321,180	1,540,519	(1,247,829)	1,415,169	3,452,527
<b><i>Electric (no Broadband)</i></b>					
Revenues	35,271,849	34,131,980	38,137,587	40,477,434	41,672,172
Expenses	<u>31,033,161</u>	<u>30,748,699</u>	<u>34,148,994</u>	<u>35,535,759</u>	<u>35,290,399</u>
Income (loss)	4,238,689	3,383,281	3,952,594	4,941,675	6,381,774
<b><i>Financial Effect of Broadband Network</i></b>					
Income (Loss)	82,492	(1,842,762)	(5,200,423)	(3,526,506)	(2,929,247)
Cumulative Income (Loss)	(161,535)	(2,004,297)	(7,204,719)	(10,731,225)	(13,660,472)

broadband network (\$1.4 million), so the rate increase would have been unnecessary absent the broadband network. The rate increase—an explicit cross-subsidy—represented an increase in electricity rates of a whopping \$5.39 per month for OPS’s electric customers, both residential and commercial.<sup>11</sup> This rate increase is sizable for a city with an average household income half that of the nation and just over 20% of its population living below the poverty level.<sup>12</sup>

In addition to this first round of debt, an additional \$13.5 million in loans was taken a few years later and assigned to the telecommunications division. Interest payments for this debt are about \$390,000 annually. Thus, the bulk of the debt has been assigned to the electric rather than the telecommunications division.

**Calculating the Financial Consequences**

Assets purchased with the first round of debt also appear on the electric utility’s books, impacting revenues, expenses, depreciation, and

city’s electricity operation “as if” the broadband network was never constructed. Comparing the commingled financials of the electric and telecommunications divisions to this counterfactual provides a clear picture of the financial impact of the broadband network.

The finances of Opelika’s electric utility are quite stable over time. The utility purchases electricity, which it then distributes over its distribution network. Although revenues of the electric division have risen to cover the financial losses of the broadband network, I will not separate these cross-subsidies from the analysis. (An approximation suggests that the cross-subsidy through an electric rate increase equals about \$3 million.<sup>13</sup>) Assuming electricity expenses are unaffected by the broadband network, all that is required to produce the counterfactual is a calculation of non-power expenses of the electric division; that is, non-power expenses free from the influence of the broadband network. Between 2007 and 2010, the four years before construction began, non-power expenses (depreciation and other costs) grew about \$0.4 million annually. I apply a

linear trend based on expense over this period to approximate the non-power cost of the electric division for the 2011 to 2010 period.

Combining the finances of the electric and telecommunications division is straightforward, as the data is available in the city’s financial statements. First, all operating revenues and expenses are included in the analysis. Second, as the electric utility receives a transfer from the telecommunications division for “Fiber Optic Line Leases,” I include those (non-operating) revenues since they appear as operating expenses to the telecommunications division. (Thus, the two are a wash.) Third, I also include

and shed significant light on the prospects for the network’s future profitability. The larger are the cumulative losses, the less likely the network will ever break even (at least by any traditional financial metric).

To begin, let’s look at the finances of the standalone electric utility. Income averages about \$4.6 million annually, which is consistent with the financial results prior to the construction of the broadband network (at \$5 million for 2007 through 2010).

In looking at the combined electric and telecommunications division, the cross-subsidy

**Table 2. Financial Forecast for Opelika’s Broadband Network**

	2016	2017	2018	2019	2020
<b><i>Electric + Broadband</i></b>					
Revenues	47,001,981	47,941,112	49,755,977	51,448,272	53,055,983
Expenses	<u>43,549,454</u>	<u>\$44,691,877</u>	<u>\$46,205,453</u>	<u>\$47,650,617</u>	<u>\$49,048,571</u>
Income (loss)	3,452,527	\$3,249,236	\$3,550,524	\$3,797,655	\$4,007,412
<b><i>Electric (no Broadband)</i></b>					
Revenues	41,672,172	41,659,798	42,804,662	43,949,527	45,094,391
Expenses	<u>35,290,399</u>	<u>36,809,063</u>	<u>37,925,091</u>	<u>39,041,118</u>	<u>40,157,145</u>
Income (loss)	6,381,774	4,850,735	4,879,572	4,908,409	4,937,246
Income (Loss)	(2,929,247)	(1,601,499)	(1,329,047)	(1,110,754)	(929,834)
Cumulative Income (Loss)	(13,660,472)	(15,261,971)	(16,591,018)	(17,701,772)	(18,631,606)

all interest expenses (a non-operating expense) related to the broadband network, since these expenses arise solely because of the construction of the fiber network.

**Financial Impact of Broadband Network**

The financial losses for years 2012-2016 are reported in Table 1. In considering these figures, it is important to keep in mind that for communications networks losses are expected in the early years of operation. These networks require large upfront investments and revenues are not realized until after the network is constructed. For the network to be profitable (that is, have a positive net present value), it is necessary for revenues not only to exceed expenses on an annual basis in future years, but to do so by an amount sufficient to recoup all losses accumulated during the early years. As such, cumulative losses are reported in the table,

from the electric to the telecommunications division becomes plain. For the combined divisions, income is much lower than for the standalone electric division, but the joint income remains positive in all years but 2014. Income from the electric division was sufficient to cover the losses for the broadband network, but this does not imply the broadband network has had minimal financial impact. Prior to the broadband network, the city benefitted from the internal transfer of millions in profits from the electric division, and now those profits are substantially lower, impacting all taxpayers.

The true financial impact of the broadband network is the difference between the combined divisions and the standalone electric utility. For instance, in 2013, the standalone electric utility would have had a positive income of \$3.38 million. The combined divisions, however, only had a positive income of \$1.54 million. Thus,

the broadband network reduced the city's income by \$1.8 million (= 1.54 - 3.38), raising cumulative losses to \$2 million when added to the cumulative loss of \$0.16 million in 2012.

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In addition to these losses, the city has taken on \$41.6 million in debt. At the end of 2016, the broadband network had the city in a \$55 million hole without any reasonable expectation of escape. The market value of the system is unknown, but faltering municipal systems typically sell for pennies on the dollar. In Groton, Connecticut, the city took on \$38 million in debt to build a broadband network.<sup>14</sup> The

network was sold to a private investor for \$550,000 (about 1.4 cents on the dollar). In Provo, Utah, a network build with \$39 million in debt was sold for \$1.<sup>15</sup> Provo, like Opelika, added a \$5.35 monthly fee to electric bills to cover the losses of the broadband network, but still could not rescue the faltering finances of the network. By these indicators, the market value of the OPS network is likely to be pennies on the dollar.

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*In 2016, \$20 of the average OPS electric customer's bill was used to subsidize the broadband network. By the end of 2016, the average electric customer had funded a subsidy of \$1,125 from the electric to the telecommunications division.*

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The difference between the actual losses of the broadband network and those reported for the telecommunications division by the city are likewise sizable. In 2016, for instance, the city's books reported a loss for the telecommunications division of \$1.36 million (operating losses plus interest expense), about \$1.6 million below the actual loss computed here. The difference is, in part, related to the shifting of broadband expenses to the electric division, including (but not limited to) the \$1.4 million in interest expenses assigned to the electric division but caused by the broadband network. Other hidden expenses include the expenses related to the assets purchased with the \$28.1 million loan and assigned to the electric division. The margins of the electric utility also were rising prior to the construction of the broadband network. Over the life of the broadband network, the city reports cumulative losses for the telecommunications division equal of only \$6.45 million, when actual losses are more than twice that at \$13.7 million.

Opelika is a small Alabama town of approximately 11,000 homes, and OPS provides service to 12,142 electric customers. In 2016, OPS's telecommunications division had 3,200 customers, or about one-third of broadband subscribers.<sup>16</sup> Using these figures, it is possible to see the impact of the cross-subsidy on a more personal basis. In 2016, \$20 of the average OPS electric customer's bill was used to subsidize the broadband network. By the end of 2016, the average electric customer had funded a subsidy of \$1,125 from the electric to the telecommunications division. Not everyone subscribes to OPS's broadband service. In 2016, electric customers paid a subsidy of \$900 per broadband account; through 2016 the electric customers had accumulated a total of \$4,300 in subsidies per broadband account.

### Forecasting the Future

Table 1 shows that the financial effect of the broadband network is sizable. Over the entire period for which expenses related to the broadband network were positive, the cumulative losses through 2016 are \$13.7 million. In 2016, \$2.9 million was added to the losses. Revenue growth in the broadband sector is far too slow to overcome this enormous deficit, so the losses will continue to mount.

It is natural to ask how the financial situation will change over the next few years. To do so, I forecast the financials through 2020. Using simple forecast models, revenues and expenses are projected through 2020.<sup>17</sup> All non-operating revenues and expenses are set equal to the 2016 levels as they do not change much over time.

The forecasts through 2020 are summarized in Table 2. As the earlier data predict, the annual losses decline slightly over the years as telecommunications revenue increases. Still, the financial impact from the addition of the broadband networks to the city's business services results in a nearly \$1 million loss in 2020. Cumulative losses in 2020 are \$18.6

million. Before the network "breaks even," this sizable and growing cumulative loss must be recovered from annual income.

Given the predicted loss in 2020, and the slow financial progress of the telecommunications division (reducing the loss by a few hundred thousand each year), the losses are expected to accumulate for many years after 2020. The broadband network has resulted in a sizable financial hole from which there is little hope the city will ever emerge.

### Grid Modernization

In response to prior analysis of the finances of the Opelika broadband system, Mayor Fuller has responded that the financial assessment, "incorrectly attributes the cost of an electric grid modernization (\$20 million) to the cost of the FTTH network (\$23 million)."<sup>18</sup> This "grid modernization" argument is commonly used by cities to justify the shifting of costs from the broadband network to the electric division, but is a questionable claim.

First, Smart Grid applications do not require fiber optic connections to households, and home metering and real-time pricing can be accomplished using much cheaper and readily available technologies.<sup>19</sup> The manager of Chattanooga's city-built fiber network, which is also heavily subsidized by electric ratepayers, admitted that fiber was not necessary for grid modernization.<sup>20</sup> Financial audits indicate that only about 4-6% of the costs of a broadband network are reasonably assigned to a municipal electric utility for grid modernization.<sup>21</sup>

Second, Moody's downgrade of Opelika's electric division's \$28 million debt from Aa3 to A1 was not based on grid modernization but because those funds were being used for "financial support of the city's relatively new telecommunications enterprise."<sup>22</sup> Moody's due diligence did not conclude modernization was sufficient to cover the debt for the fiber network and discovered the truth about how the electric

division's debt was being used to subsidize the telecommunications division.

### Expanding the Network

As in many states, Alabama law confines Opelika's broadband network to OPS's geographic footprint. Alabama Senator Tom Whatley has offered several bills over the past few years that would permit Opelika's broadband network to go beyond the city's limits and perhaps beyond county lines. Each year, the bills die in committee.<sup>23</sup> This legislative resistance to the bills is unsurprising, as a government-owned and operated network subsidized by taxpayers competing with private-sector networks is antithetical to the Republican ideology pervasive in Alabama's legislature, unless, apparently, the Republican represents Opelika's legislative district.

In light of the financial analysis above, perhaps legislators opposing the expansion had the interests of Opelikans in mind. The actual and predicted future losses for Opelika's city network alone are worrisome. But, for many reasons, expanding the broadband network beyond the city limits will add materially to the city's financial burden.

First, losses in the early years are inevitable, and cumulated losses are already over \$13 million and continuing to rise for the near future.

Second, within its city limits, OPS has numerous advantages (permitting, pole attachments, rights-of-way, and so forth). Outside its limits, these advantages are unavailable, so the cost of network construction and expenses will be considerably higher, deepening the losses in the early years (and perhaps indefinitely).

Third, OPS also has no customer relationships outside its footprint, making it more difficult to acquire customers. Add to that the fact that the only decent sized city near Opelika is Auburn, Alabama (about 21,000 households). Auburn already hosts three broadband providers

(AT&T, Charter, and WoW), so customers will be harder to obtain in Auburn.<sup>24</sup>

Fourth, and making matters much worse, Mayor Fuller and Senator Whatley claim the expansion of the network is motivated by a desire to offer service to high-cost, low-demand areas the private sector will not serve because revenues are inadequate to cover costs.<sup>25</sup> Certainly, financial losses are expected in these high-cost, low-revenue areas private providers won't serve, adding substantially to the city's ongoing financial quagmire.

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Finally, what seems most perverse about the expansion is that the inevitable financial losses that arise as the network reaches beyond the city's limits must also be subsidized by Opelika's taxpayers and captive ratepayers. There is no one else to subsidize these losses. OPS does not sell electric services and the city has no tax authority outside the city's limits, thereby eliminating a source of cross-subsidy, requiring these losses to be funded by debt paid by Opelikans and OPS's captive ratepayers.

While the citizens of Auburn, Alabama, may embrace the idea of Opelikans paying a portion of their broadband bill, I doubt the people of Opelika will find much pleasure in doing so. It is one thing when a city's residents subsidize

their own municipality's broadband, but quite another when they are tasked with subsidizing someone else's Internet connections. I doubt this stark reality has been explained to Opelika's taxpayers and electric ratepayers. Apparently, since city need not explain anything to its constituents and ratepayers, as the additional debt to expand the network can be taken without constituent approval.

### Conclusion

In 2013, the City of Opelika began selling broadband services to its constituents, in direct competition with private providers, over a network constructed and largely financed by the city's captive electric ratepayers. While the city's mayor claims the financial impact of the network is *de minimis* and the network is on target to break even, a review of the city's financial statement suggests otherwise. Since the network began construction, the City of Opelika has amassed losses of over \$13 million. The losses are predicted to continue, with a cumulative loss approaching \$20 million by

2020, adding nearly \$1 million in losses in that year. The annual losses are falling slowly, so after 2020 the cumulative financial losses will continue to mount while the heavy debt burden remains. There is little hope the OPS network will itself ever be profitable and free from the financial support by the electric division.

Expanding the network beyond the city's limits, as has been requested by the mayor and some elected representatives from the area, is a dangerous idea. The people of Opelika already have had to subsidize tens of millions in losses for the services subscribed to by only about a third of households, and adding millions more to the financial burden on Opelikans so that households outside the city can have broadband service is a peculiar policy indeed. Opelikans certainly have nothing to gain from an expansion of the network, forcing the question—*who does stand to gain financially from its expansion?* As I see it, the people of Opelika should be seeking an answer to this question.

## NOTES:

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<sup>1</sup> J. Armstrong, *Opelika Puts Itself on the Main Line*, BUSINESSALABAMA.COM (August 2014) (available at: <http://www.opelika.org/Sites/Opelika/Documents/Main/BUSINESS%20ALABAMA%20-%20OPS.pdf>). Demographic data available at: <http://statisticalatlas.com/place/Alabama/Opelika/Household-Types>.

<sup>2</sup> <https://muninetworks.org/communitymap>.

<sup>3</sup> A detailed economic analysis of municipal broadband is provided in G.S. Ford, *The Impact of Government-Owned Broadband Networks on Private Investment and Consumer Welfare*, State Government Leadership Foundation (April 6, 2017) (available at: [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2973274](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2973274)); see also NTU Policy Paper #129: *Municipal Broadband "Wired to Waste"*, POLICY PAPER, National Taxpayers Union (April 9, 2012) (available at: <http://www.ntu.org/governmentbytes/detail/ntu-policy-paper-129-municipal-broadband-wired-to-waste>); J. Kampis, *New York Law School: Government Broadband a Taxpayer Sinkhole*, Watchdog.org (December 30, 2016) (available at: <http://watchdog.org/284815/new-york-law-government-broadband>); C.M. Davidson and M.J. Santorelli, *Understanding the Debate over Government-Owned Broadband Networks: Context, Lessons Learned, and a Way Forward for Policy Makers*, Advanced Communications Law & Policy Institute (June 2014) (available at: <http://www.nyls.edu/advanced-communications-law-and-policy-institute/wp-content/uploads/sites/169/2013/08/ACLP-Government-Owned-Broadband-Networks-FINAL-June-2014.pdf>). In a few cases, the networks have resulted in criminal investigations. See, e.g., D. McGee, *Former BVU CEO Sentenced*, BRISTOL HERALD JOURNAL (October 8, 2015) (available at: [http://www.heraldcourier.com/news/former-bvu-ceo-sentenced/article\\_79ff7ff0-6e34-11e5-a905-af41ef064227.html](http://www.heraldcourier.com/news/former-bvu-ceo-sentenced/article_79ff7ff0-6e34-11e5-a905-af41ef064227.html)); C. Yoo and T. Pfenninger, *Municipal Fiber in the United States: An Empirical Assessment of Financial Performance*, Center for Technology, Innovation and Competition (May 2017) and citations therein (available at: <https://www.law.upenn.edu/live/files/6611-report-municipal-fiber-in-the-united-states-an>).

<sup>4</sup> J. Kampis, *Alabama's "Gig City" Has One Gigabit Broadband Subscriber*, SPECTATOR.ORG (September 12, 2016) (available at: <https://spectator.org/alabamas-gig-city-has-one-gigabit-broadband-subscriber>).

<sup>5</sup> Opelika Alabama: Audited Financial Statements for the City (available at: <http://www.opelika-al.gov/Default.asp?ID=403&pg=Audited+Financial+Statements+for+the+City>).

<sup>6</sup> Armstrong, *supra* n. 1.

<sup>7</sup> G. Fuller, *OPS broadband? Opelika Mayor Says Yes, and Here's Why*, OANOW.COM (March 28, 2017) (available at: [http://www.oanow.com/news/local/ops-broadband-opelika-mayor-says-yes-and-here-s-why/article\\_2dc323ee-13c4-11e7-8ee9-a3c8caa17506.html](http://www.oanow.com/news/local/ops-broadband-opelika-mayor-says-yes-and-here-s-why/article_2dc323ee-13c4-11e7-8ee9-a3c8caa17506.html)).

<sup>8</sup> *Moody's Assigns A Aa3 Rating to the City of Opelika Electric Enterprise's (A1) \$25 Million Revenue Bonds, Series 2011* (January 31, 2011) (available at: [https://www.moodys.com/research/MOODYS-ASSIGNS-A-Aa3-RATING-TO-THE-CITY-OF-OPELIKA-New-Issue--NIR\\_16726545](https://www.moodys.com/research/MOODYS-ASSIGNS-A-Aa3-RATING-TO-THE-CITY-OF-OPELIKA-New-Issue--NIR_16726545)).

<sup>9</sup> *Rating Action: Moody's downgrades Opelika Electric, AL to A1*, Global Credit Research (December 11, 2014) (available at: [https://www.moodys.com/research/Moodys-downgrades-Opelika-Electric-AL-to-A1--PR\\_315011](https://www.moodys.com/research/Moodys-downgrades-Opelika-Electric-AL-to-A1--PR_315011)).

<sup>10</sup> Ordinance No. 126-14, OPELIKA OBSERVER (September 17, 2014) (available at: <http://opelikaobserver.com/2014/09/ordinance-no-126-14-919/>); Opelika City Council, *Regulatory Meeting Agenda*, City of Opelika (December 15, 2015) (available at: <http://opelikacityal.iqm2.com/Citizens/FileOpen.aspx?Type=1&ID=1033&Inline=True>) at pp. 15-18.

<sup>11</sup> The revenue shortfall was \$784,935. Dividing the shortfall by 12,142 total customers results in an increase of \$5.39 per household, per month. *Electric Sales, Revenue, and Average Price: 2015 Utility Bundled Retail Sales - Total*: Energy Information Administration (October 2016) (available at: [https://www.eia.gov/electricity/sales\\_revenue\\_price/pdf/table10.pdf](https://www.eia.gov/electricity/sales_revenue_price/pdf/table10.pdf)).

<sup>12</sup> <http://www.electricitylocal.com/states/alabama/opelika/#ref>.

<sup>13</sup> Over the 2010-2014 period, the average ratio of electric revenues to power costs was 1.394. In 2015-2016, that ratio increased to 1.45, a \$3 million differential in the markup of wholesale electric expenses.

## NOTES CONTINUED:

- <sup>14</sup> Ford, *supra* n. 3 at p. 56; G. Smith, *Groton's Deal to Shed TVC Finalized as New Owners Take the Reins*, THE DAY.COM CONNECTICUT (February 1, 2013) (available at: <http://www.theday.com/article/20130201/NWS01/130209982>); D. Straszheim, *How a Promising Idea Went Terribly Wrong in Groton*, GROTON PATCH (January 6, 2013) (available at: <http://groton.patch.com/groups/politics-and-elections/p/how-a-promising-idea-went-horribly-wrong-ingroton>).
- <sup>15</sup> Ford, *id.* at pp. 53-4.
- <sup>16</sup> Energy Information Administration, *supra* n. 11; A. Burger, *LRG: U.S. Broadband Penetration Rises to 79% of Households, Smartphone Role Increasing*, TELECOMPETITOR (October 24, 2014) (available at: <http://www.telecompetitor.com/lrg-u-s-broadband-penetration-rises-to-79-of-households-smartphone-role-increasing>); G. Fuller, *Setting The Record Straight - Response to Yellowhammer Article*, City of Opelika (February 16, 2017) (available at: <http://www.opelika-al.gov/Default.asp?ID=16&pg=City+News&action=view&aid=1760&title=Setting+The+Record+Straight+-+Response+to+Yellowhammer+article>).
- <sup>17</sup> Linear and log-linear trend models are employed, depending on which fits the data best.
- <sup>18</sup> Fuller, *supra* n. 7.
- <sup>19</sup> *An In-Depth Look at Click! Financials: TACOMA PUBLIC UTILITIES* (May 20, 2015) at p. 24 (available at: [https://www.clickcabletv.com/file\\_viewer.php?id=52](https://www.clickcabletv.com/file_viewer.php?id=52)) (“Tacoma Power doesn’t need a wired telecommunications network for metering”; *id.* at p. 23 (“Did not foresee the industry evolution to wireless power metering systems.”); P. Fuhr, W. Manges, T. Kuruganti, *Smart Grid Communications Bandwidth Requirements: An Overview*, SG COMMUNICATIONS TECHNOLOGY REVIEW (February 2011) (available at: <http://trustworthywireless.ornl.gov/pdfs/Smart-Grid-Communications-Overview-Bandwidth-2011.pdf>).
- <sup>20</sup> C. Butler, *Chattanooga Residents Get Internet, Courtesy of Taxpayers*, TENNESSEEWATCHDOG.NET (December 21, 2011) (available at: <http://watchdog.org/1019/tn-chattanooga-residents-get-internet-courtesy-of-taxpayers>) (“the manager of Chattanooga’s system] admitted last month they could get the same information, and with the same accuracy, without the Smart Grid.”).
- <sup>21</sup> *An In-Depth Look at Click! Financials*, *supra* n. 19 at pp. 28-33.
- <sup>22</sup> Moody’s, *supra* n. 9.
- <sup>23</sup> J. Little, *Whatley Discusses Battle Over Broadband, Concealed-Carry Among Other Topics*, OANOW.COM (March 23, 2017) (available at: [http://www.oanow.com/news/local/whatley-discusses-battle-over-broadband-concealed-carry-among-other-topics/article\\_0e455bad-aff1-526d-a507-981b7bfa5745.html](http://www.oanow.com/news/local/whatley-discusses-battle-over-broadband-concealed-carry-among-other-topics/article_0e455bad-aff1-526d-a507-981b7bfa5745.html)).
- <sup>24</sup> <https://broadbandnow.com/Alabama/Auburn>.
- <sup>25</sup> *Opelika GIG Internet Service Could Expand to Auburn*, AUBURN PLAINSMAN (March 31, 2017) (available at: <http://www.theplainsman.com/article/2017/03/opelika-gig-internet-service-could-expand-to-auburn>).