

Lingering Supply Side Challenges

Broadband is nearly universal but not quite; some rural areas remain unserved. Private and public resources to bring broadband to these areas are not unlimited, and as discussed in section 3.2, the public resources are certainly finite. A key policy focus going forward, at least on the supply side, is for public and private entities to work together and focus efforts and resources on bringing broadband to the few remaining parts of the country that actually remain unserved.

The FCC has begun attempting to shift federal universal service funds to support network deployment to these areas. Additional experimentation is ongoing at the state and local levels, as public entities explore opportunities to partner with the private sector in an effort to figure out the economics of serving these “uneconomic” areas. These and other methods provide municipalities with a wide array of options for bringing broadband to unserved areas and working with ISPs and others to bolster connectivity in areas that are already served.

3.1.2 Demand Side Challenges: Barriers to More Robust Use of Broadband

Much of the debate over broadband in the United States has revolved around the supply of high-speed Internet connectivity. Indeed, even as broadband and intermodal competition diffused across nearly every part of the United States over the last decade, the policy focus has remained largely on notions of universal service, notwithstanding the more systemic issue of disparities in adoption rates across a range of user communities.¹⁵⁸ Implicit in many supply side arguments is an assumption that demand side issues will resolve themselves once there is ample supply of cheap and ultra-fast broadband.¹⁵⁹ Though appealing, this reductive cause-and-effect has been questioned by social scientists, researchers, practitioners, and others who have worked to identify and better understand the complex mechanics associated with broadband adoption across key demographics and in key sectors. The following discussion details the evolution of these challenges and identifies their modern contours.

3.1.2.1 Measuring and Understanding Internet Use

The contours of the digital divide(s) in the United States have been evident since the mid-1990s, when the U.S. Department of Commerce first began to track trends in computer ownership and Internet usage. These early studies identified a number of factors, including age, race, income, and educational attainment, that seemed to predict whether a particular person or household would use these technologies.¹⁶⁰ Table 3.8 provides an overview of Internet use data from the late 1990s and early 2000s.

158 Despite an array of universal service obligations imposed by Federal and state law, basic telephone service never reached 100% penetration. For recent data, see Alexander Belinfante, *Telephone Subscribership in the United States (Data Through November 1999)*, p. 5, Table 1, Common Carrier Bureau, FCC (Jan. 2000), available at http://transition.fcc.gov/Bureaus/Common_Carrier/Reports/FCC-State_Link/IAD/subs1199.pdf (providing telephone penetration data for 1983-1999); Stephen J. Blumberg and Julian V. Luke, *Wireless Substitution: Early Release of Estimates from the National Health Interview Survey, January-June 2013*, CDC (Dec. 2013), available at <http://www.cdc.gov/nchs/data/nhis/earlyrelease/wireless201312.pdf> (providing telephone penetration data for 2003-2013).

159 See, e.g., CAPTIVE AUDIENCE.

160 See *Falling Through the Net I; Falling Through the Net II: New Data on the Digital Divide*, NTIA, U.S. Dept. of Commerce (July 1998), available at <http://www.ntia.doc.gov/report/1998/falling-through-net-ii-new-data-digital-divide>; *Falling Through the Net III: Defining the Digital Divide*, NTIA, U.S. Dept. of Commerce (July 1999), available at <http://www.ntia.doc.gov/legacy/ntiahome/ftn99/FTTN.pdf>; *Falling Through the Net IV: Toward Digital Inclusion*, NTIA, U.S. Dept. of Commerce (Oct. 2000), available at <http://www.ntia.doc.gov/files/ntia/publications/ftn00.pdf>.

Table 3.8: Internet Use in the United States (Percent of Population): 1997–2001

	1997	1998	2000	2001
Total Population	22.2%	32.7	44.4	53.9
Race				
White	25.3	37.6	50.3	59.9
Black	13.2	19	29.3	39.8
Hispanic	11	16.6	23.7	31.6
Age				
18–24	31.6	44.3	56.8	65
25–49	27.1	40.0	55.4	63.9
50+	11.2	19.3	29.6	37.1
Income				
<\$15,000	9.2	13.7	18.9	25
\$35,000–\$50,000	22.8	34.7	46.5	57.1
>\$75,000	44.5	58.9	70.1	78.9
Education Level				
Less than H.S.	1.8	4.2	8.8	12.8
H.S. Diploma/GED	9.7	19.2	30.6	39.8
College Degree	41.4	58.4	72.5	80.8

Source: *A Nation Online: How Americans Are Expanding Their Use of the Internet*, NTIA, U.S. Dept. of Commerce (February 2002), available at <http://www.ntia.doc.gov/files/ntia/publications/anationonline2.pdf>

Contemporaneous inquiries into why individuals elected not to go online revolved almost exclusively around attitudes toward the Internet. A Pew survey from 2000, for example, found that most non-Internet users either perceived the Internet to be a “dangerous thing” or did not think they were “missing anything” by being offline.¹⁶¹ The cost of Internet access and necessary hardware for going online (e.g., a computer) was also cited as an impediment for the unconnected.¹⁶² Early analyses indicated, however, that the cost factor influenced decisions across every demographic and income group, suggesting that the issue of price sensitivity was more nuanced than initially thought.¹⁶³

By the mid-2000s, broadband replaced dial-up as the preferred on-ramp to the Internet, a rapid shift caused by a growing appreciation among consumers and policy makers of the transformative potential of high-speed Internet connectivity.¹⁶⁴ To facilitate continued growth, a minimalist regulatory framework was implemented for broadband access.¹⁶⁵ One important result was across-the-board substantial investment in broadband delivery platforms, which, coupled with increasing consumer demand, extended next-generation networks to

161 See Amanda Lenhart et al., *Who's not Online: 57% of those Without Internet Access Say They do Not Plan to Log On*, at p. 3, Pew Internet & American Life Project (Sep. 2000), available at http://www.pewinternet.org/~media/Files/Reports/2000/Pew_Those_Not_Online_Report.pdf.

162 *Id.*

163 *Id.* at 11. See also *A Nation Online: How Americans Are Expanding Their Use of the Internet*, at p. 75-76, NTIA, U.S. Dept. of Commerce (Feb. 2002), available at <http://www.ntia.doc.gov/files/ntia/publications/anationonline2.pdf>.

164 See, e.g., *Networked Nation: Broadband in America in 2007*, NTIA, U.S. Department of Commerce (Jan. 2008), available at http://www.ntia.doc.gov/files/ntia/publications/networkednationbroadbandinamerica2007_0.pdf (discussing the many ways in which broadband was expected to impact the economy and modern life).

165 See *supra*, section 2, for an overview of the regulatory response to broadband and the criticism that it received by GONs advocates.

more areas of the country, encouraged intermodal competition, and led to wider availability of better, cheaper services for households.¹⁶⁶

Significant growth in adoption rates across every demographic group followed (see Table 3.9).

Table 3.9: Home Broadband Adoption (Percent of Population): 2005–2008

	2005	2006	2007	2008
Total Population	33%	42	47	55
Race				
White	31	42	48	57
Black	14	31	40	43
Hispanic (English Speaking)	28	41	47	56
Age				
18–29	38	55	63	70
30–49	36	50	59	69
50–64	27	38	40	50
65+	8	13	15	19
Income				
<\$20,000	13	18	28	25
\$50,000–\$75,000	35	48	58	67
>\$100,000	62	68	82	85
Education Level				
Less than H.S.	10	17	21	28
H.S. Diploma/GED	20	31	34	40
College+	47	62	70	79

Source: John Horrigan, *Home Broadband Adoption 2008*, Pew Internet and American Life Project (July 2008), available at http://www.pewinternet.org/~media/Files/Reports/2008/PIP_Broadband_2008.pdf

As the market for high-speed Internet access continued to develop (on both the supply side and demand side) and as the service became increasingly integral to modern life, understanding the mechanics of broadband adoption and the reasons for non- or under-adoption became a priority. Studies from the early 2000s had confirmed the hazards associated with extending “real world” inequalities into cyberspace.¹⁶⁷ More generally, however, the danger of being left on the wrong side of the digital divide became increasingly palpable as consumers and businesses used their connections for a broader range of personal, civic, social, and commercial activities. Studies increasingly identified digital literacy as a vital component associated with broadband adoption; those without the skills to harness the power of broadband were more likely to view it as too costly or not worth an investment of time and money.¹⁶⁸ As a result, policy makers and other stakeholders slowly began to appreciate the complexities inherent in broadband adoption and focused more on the demand side of the connectivity equation.

¹⁶⁶ See *supra*, section 3.1.1, for additional discussion.

¹⁶⁷ See, e.g., Paul DiMaggio et al., *Social Implications of the Internet*, 27 *Annual Review of Sociology* 307–336 (2001).

¹⁶⁸ See, e.g., KAREN MOSSBERGER ET AL., *VIRTUAL INEQUALITY: BEYOND THE DIGITAL DIVIDE* (Georgetown University Press: Washington, D.C. 2003).

Nevertheless, some continued to believe price was the primary reason for non-adoption in many communities. Much of the appeal of municipal Wi-Fi projects and other GONs from this era hinged on the perceived ability to use these networks to offer free or low-cost broadband Internet access to vast swaths of the population.¹⁶⁹ It was argued that free, readily available Internet access would be enough on its own to encourage non-adopters to go online via a high-speed connection. But, as discussed in section 2, many of these systems eventually did not fulfill expectations because of under-use.¹⁷⁰ Free, it turned out, was not enough to attract non-users.¹⁷¹

3.1.2.2 Identifying and Understanding Major Barriers to Broadband Adoption

The complex and multifaceted nature of connecting the unconnected became more apparent to policy makers and other stakeholders in the wake of federal efforts to strengthen high-speed Internet access. In conjunction with preparation of its *National Broadband Plan*, the FCC in early 2010 released a comprehensive analysis of broadband adoption in the United States.¹⁷² The FCC would use these findings to inform dozens of recommendations included in its *Plan*, prepared at the behest of Congress to develop a strategy for using broadband to realize a number of “national purposes.”¹⁷³ More generally, these findings served to sustain the momentum of a variety of other federal broadband-related efforts, including the allocation of billions of dollars in support of programs to bring broadband to unserved areas, raise adoption rates, and improve digital literacy skills.¹⁷⁴

These efforts encouraged more comprehensive investigations of the myriad practical barriers to broadband adoption in specific user communities and sectors of the economy. The resulting studies, along with the *National Broadband Plan*, provided a more complete understanding of the factors that influence broadband adoption decisions.¹⁷⁵

A key point that emerged was that many chose not to adopt broadband because they did not see it as relevant to them and thus not worth the investment of time and money to purchase the service (and related equipment, like a computer) and learn how to use it.¹⁷⁶ This outlook impacted the perceived affordability of broadband, contributing to a significant number of non-adopters who viewed the service as too expensive despite the fact

169 See, e.g., *Wi-Fi Everywhere*.

170 See *supra*, section 2.2. See also *Reality Bites*, Aug. 30, 2007, *The Economist*, available at <http://www.economist.com/node/9726651> (“Worse, the networks that have been completed have attracted few users. Taipei’s city-wide WiFly system, the largest such network in the world, was reckoned to need 250,000 regular subscribers by the end of 2006 in order to break even, but had attracted only 30,000 by April 2007. America’s biggest network, around Tempe, Arizona, was aiming for 32,000 subscribers, but had only 600 in April 2006 and has not provided figures since.”).

171 These arguments were continuously made despite data to the contrary. Indeed, several studies at the time found that the price of broadband had little effect on adoption decisions. See John B. Horrigan, *Why it Will be Hard to Close the Broadband Divide*, at p. 3, Pew Internet & American Life Project (Aug. 2007), available at http://www.pewinternet.org/~media/Files/Reports/2007/Broadband_Commentary.pdf (“Most research on broadband adoption suggests price is not a large factor in the purchasing decision.”); Kenneth Flamm & Anindya Chaudhuri, *An Analysis of the Determinants of Broadband Access*, 31 *Telecom. Pol’y* 312-326 (July-August 2007).

172 See John Horrigan, *Broadband Adoption and Use in America*, at p. 3, OBI Working Paper Series No. 1 (Feb. 2010), available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-296442A1.pdf (“*Broadband Adoption and Use in America*”).

173 *National Broadband Plan* at p. 3.

174 See, e.g., NTIA, BTOP: About, <http://www2.ntia.doc.gov/about>.

175 These studies included: Charles M. Davidson and Michael J. Santorelli, *Barriers to Broadband Adoption: A Report to the FCC*, Advanced Communications Law & Policy Institute, New York Law School (Oct. 2009), available at http://www.nyls.edu/user_files/1/3/4/30/83/ACLP%20Report%20to%20the%20FCC%20-%20Barriers%20to%20BB%20Adoption.pdf (identifying dozens of barriers impeding more robust broadband adoption by senior citizens and people with disabilities and across the education, healthcare, energy, and government sectors) (“*Barriers to Broadband Adoption*”); Jon Gant et al., *National Minority Broadband Adoption*, Joint Center for Political and Economic Studies (Feb. 2010), available at http://www.jointcenter.org/sites/default/files/upload/research/files/MTI_BROADBAND_REPORT_WEB.pdf (identifying barriers impacting African Americans and Hispanics) (“*National Minority Broadband Adoption*”); Dharma Dailey et al., *Broadband Adoption in Low Income Communities*, Social Science Research Council (March 2010), available at http://www.ssrc.org/workspace/images/crm/new_publication_3/%7B1eb76f62-c720-df11-9d32-001cc477ec70%7D.pdf (identifying barriers impacting low-income households) (“*Broadband Adoption in Low Income Communities*”).

176 See, e.g., *Broadband Adoption and Use in America* at p. 5.

prices had been generally declining.¹⁷⁷ A related impediment to further adoption across most user groups was a lack of digital literacy skills.¹⁷⁸ The absence of these skills contributed to widely held fears among non-adopters about the security and privacy of going online and participating in activities like e-commerce.¹⁷⁹

The impact of these attitudes toward broadband was heightened by numerous other barriers to adoption unique to particular user groups. Many were identified by researchers and social scientists, and used by the FCC in its *Plan*. Table 3.10 provides an overview of barriers impacting four under-adopting user groups: senior citizens, people with disabilities, minorities, and low-income households. A similar range of barriers was seen as obstacles to further use of broadband in key sectors like education, energy, and healthcare. Table 3.11 summarizes those barriers.

Table 3.10: Barriers Impacting Senior Citizens, People with Disabilities, Minorities, and Low-Income Households

Senior Citizens	People with Disabilities	Minority Communities	Low-Income Households
<ul style="list-style-type: none"> • Lack of awareness regarding the value of using broadband • Usability concerns • Low rate of computer ownership • Security and privacy concerns • Lack of senior-focused training programs 	<ul style="list-style-type: none"> • Low levels of computer ownership • Negative perceptions about broadband accessibility and broadband-enabled services • Affordability concerns • Interoperability of assistive technologies • Lack of digital literacy skills 	<ul style="list-style-type: none"> • Lack of awareness regarding the value of using broadband • Low rates of computer ownership • Affordability concerns • Underdeveloped digital literacy skills 	<ul style="list-style-type: none"> • Perception that broadband is not a worthwhile investment of scarce funds • Lack of digital literacy skills • Low rates of computer ownership • Affordability concerns tied to billing issues

Sources: National Broadband Plan; Barriers to Broadband Adoption; Broadband Adoption in Low Income Communities; National Minority Broadband Adoption

Table 3.11: Barriers Impacting the Education, Energy, and Healthcare Sectors

Education	Energy	Healthcare
<ul style="list-style-type: none"> • Cost concerns • Outdated components of the E-rate program • Lack of a more targeted strategy for allocating federal funding • Inadequate teacher training • Demographic disparities in technology literacy • Organizational barriers among educators • Lack of adequate bandwidth within schools • Lack of national curriculum standards 	<ul style="list-style-type: none"> • Outdated regulatory framework creates little incentive for utilities to innovate • State-by-state patchwork of regulation impedes national-scale deployment • Substantial upfront implementation costs • Lack of demand for smart home services by residential customers • Unresolved data security, cybersecurity, and privacy concerns 	<ul style="list-style-type: none"> • Inadequate reimbursement mechanisms for most telemedicine services • Outdated privacy and security policies • State-by-state patchwork of rules regarding physician licensure and credentialing • Implementation cost concerns • Uncertainty regarding the applicability of tort law • Skepticism among healthcare providers and patients regarding the value of using these tools

Sources: National Broadband Plan; Barriers to Broadband Adoption

177 For additional discussion regarding the cost/affordability dynamic, see Charles M. Davidson, Michael J. Santorelli & Thomas Kamber, *Broadband Adoption: Why it Matters & How it Works*, 19 Media L. & Pol'y 14 (2009) ("*Broadband Adoption: Why it Matters & How it Works*").

178 *Broadband Adoption and Use in America* at p. 5.

179 See, e.g., *Barriers to Broadband Adoption* at p. 14.

3.1.2.3 Current Broadband Adoption Trends and Continued Challenges

Understanding these nuanced barriers and tailoring outreach efforts to meet unique, group-specific needs, have not translated into significant increases in national broadband adoption figures. Despite increased awareness of the benefits of broadband, hundreds of millions of dollars in funding to support community-based education and training initiatives aimed at bringing more non-users online, continued innovation and competition throughout the ecosystem, and a broader array of service options, adoption levels—across the entire population and in many user communities—have leveled off.¹⁸⁰ Table 3.12 summarizes this trend.

Table 3.12: Home Broadband Adoption (Percent of Population): 2009–2013

	2009*	2010**	2011†	2012††	2013†††
All Adults	65	68	69	65	70
Race					
White	69	72	74	70	74
Black	59	55	55	53	64
Hispanic	49	57	56	49	53
Age					
18–29	75	77	77	75	80
30–49	74	(16–44)	(16–44)	75	78
50–64	64	72	73	62	69
		(45–64)	(45–64)	(50–64)	(50–64)
65+	35	45	49	41	43
Income					
Low-income	40	43	43	46	54
	(<\$20,000)	(<\$25,000)	(<\$25,000)	(<\$30,000)	(<\$30,000)
High-income	93	93	93	89	88
	(>\$75,000)	(>\$100,000)	(>\$100,000)	(>\$75,000)	(>\$75,000)
Education Level					
Less than H.S.	24	33	35	27	37
H.S. Diploma/GED	55	57	58	56	57
College+	86	87	88	85	89

* *Broadband Adoption and Use in America*

** *Exploring the Digital Nation: Computer and Internet Use at Home*, National Telecommunications and Information Administration, U.S. Dept. of Commerce (Nov. 2011), available at http://www.ntia.doc.gov/files/ntia/publications/exploring_the_digital_nation_computer_and_internet_use_at_home_11092011.pdf

† *Exploring the Digital Nation: America's Emerging Online Experience*, NTIA, U.S. Dept. of Commerce (June 2013), available at http://www.ntia.doc.gov/files/ntia/publications/exploring_the_digital_nation_-_americas_emerging_online_experience.pdf

†† Joanna Brenner & Lee Rainie, *Pew Internet: Broadband*, Pew Internet and American Life Project (Dec. 2012), available at <http://pewinternet.org/Commentary/2012/May/Pew-Internet-Broadband.aspx>

††† Kathryn Zickuhr & Aaron Smith, *Home Broadband 2013*, Pew Internet and American Life Project (Aug. 2013), available at http://pewinternet.org/~media/Files/Reports/2013/PIP_Broadband%202013_082613.pdf

180 See, e.g., Edward Wyatt, *Most of U.S. is Wired, but Millions Aren't Plugged in*, Aug. 19, 2013, N.Y. Times (reporting on recent Internet use and broadband adoption data and noting that usage levels have plateaued in recent years despite significant public and private expenditures to help close the digital divide).

Bridging these divides presents a major public policy challenge. Data and research discussed above indicate that simply installing more broadband infrastructure is not the solution (whether the infrastructure is privately or publicly owned). Policy focused on optimistic assumptions vis-à-vis demand side issues, such as “more supply will equal more demand” or that the price of broadband is the most important consideration, will not address the many community-specific barriers to broadband adoption.

There are numerous viable, impactful roles that policy makers can play on the demand side. A menu of successful approaches to bolstering adoption by addressing discrete barriers and improving digital literacy has emerged over the last few years. Many of the most effective approaches are being deployed at the state and local levels. As has been discussed at length elsewhere,¹⁸¹ including the *National Broadband Plan*,¹⁸² state and local governments are uniquely positioned to partner with experts in the private and nonprofit sectors toward these ends. Such initiatives have begun to move the needle on broadband adoption in under-adopting communities.¹⁸³ (A more comprehensive discussion of these roles is provided in section 6.)

3.2 Public Sector Performance to Date: Volatile Economics, Fiscal Instability, and Crumbling Infrastructure

The second key contextual point in any discussion about the viability of GONs revolves around the ability of municipalities, and, by implication, states, to fund the construction, ongoing maintenance, and evolving upgrades of these networks, and the opportunity costs of such funding.

Section 3.2.1 examines the economic realities facing municipalities and states across the country. The Great Recession exposed a number of critical weaknesses in local finances that, taken together, create an inhospitable environment for massive new investments in or the many risks associated with redundant long-term construction projects. The primary purpose of this analysis is to ground GONs discussions in the economic realities facing state and local governments.

Section 3.2.2 discusses the substantial critical infrastructure challenges currently facing the United States as a whole and individual states. By nearly every measure, basic public infrastructure, including roads, bridges, dams, water systems, ports, and the electric grid, is crumbling. Its replacement or repair will require trillions of dollars. To the extent that new funding is available for investment in towns, cities, and states, the data in this subsection indicate that those dollars should be allocated in support of repairing existing infrastructure. Calls to prioritize GONs as targets of public spending must be carefully scrutinized in light of these existing and future obligations.

3.2.1 Economic Realities Facing Municipalities and States

Detroit’s recent bankruptcy filing offers a relevant, albeit extreme, example of the harsh economic realities facing states and municipalities of all sizes. No single event or project led to what is the largest municipal bankruptcy filing in U.S. history.¹⁸⁴ Rather, it was the convergence of a host of negative economic and fiscal trends decades in the making. These included a “shrunk tax base but still a huge, 139-square-mile city to maintain; overwhelming health care and pension costs; repeated efforts to manage mounting debts with still more borrowing; annual deficits in the city’s operating budget since 2008; and city services crippled by aged

181 See, e.g., Charles M. Davidson, Michael J. Santorelli & Thomas Kamber, *Toward an Inclusive Measure of Broadband Adoption*, 6 Int’l J. of Comm. 2555-2575 (2012) (discussing the importance of local social infrastructures) (“*Toward an Inclusive Measure of Broadband Adoption*”).

182 *National Broadband Plan* at p. 167.

183 For additional examples and best practices, see *Broadband Adoption Toolkit*, National Telecommunications & Information Administration, U.S. Dept. of Commerce (April 2013), available at http://www2.ntia.doc.gov/files/toolkit_042913.pdf (“*Broadband Adoption Toolkit*”).

184 See Monica Davey and Mary William Walsh, *Billion in Debt, Detroit Tumbles into Insolvency*, July 18, 2013, N.Y. Times.

computer systems, poor record-keeping and widespread dysfunction.¹⁸⁵ The result was the accumulation of about \$18 billion in debt, of which more than half stemmed from pension and healthcare obligations, and a third from water and sewer systems.¹⁸⁶

Municipal bankruptcies remain exceedingly rare—only one in 2,710 eligible localities has filed for bankruptcy protection since 2008 (see the box to the right for recent examples)¹⁸⁷—yet the fall of Detroit is symptomatic of deep financial instability across local and state governments.¹⁸⁸ The Great Recession and the subsequent fallout have exposed many shortcomings in public sector finances, which, for too long, had been obscured by a relatively stable economic environment.¹⁸⁹

Many of the financial woes plaguing municipalities large and small stem from inability or unwillingness to appreciate the long-term consequences of short-term investments or major contractual obligations. A leading example is the looming pension crisis facing local and state governments across the country. These entitlements have become so inured in the political and social fabric that many states have strict laws guaranteeing payment of benefits accrued regardless of prevailing economic conditions.¹⁹⁰ Moreover, creative accounting rules and unrealistic assumptions about how pension funds would grow over time allowed policy makers to gloss over significant deficiencies in these accounts or delay actions that might plug growing gaps.¹⁹¹

As a result, and coupled with significant budget shortfalls caused by the Great Recession, state and local pensions are anywhere from 25 percent to more than 50 percent underfunded, which translates to a shortfall

Municipal Bankruptcies Since 2008

Local Government Bankruptcy Filings

- Detroit, Michigan (pending)
- San Bernardino, California
- Mammoth Lakes, California (dismissed)
- Stockton, California
- Jefferson County, Alabama
- Harrisburg, Pennsylvania (dismissed)
- Central Falls, Rhode Island
- Boise County, Idaho (dismissed)

Other Municipal Bankruptcy Filings

- Sanitary and Improvement District #512, Douglas County, Nebraska
- Lost Rivers District Hospital, Idaho
- Mendocino Coast Health Care District, California
- Lake Lotawana Community Improvement District, Missouri
- Rural Water District No. 1, Cherokee County, Oklahoma

185 *Id.*

186 See Mike Patton, *Detroit Files for Bankruptcy Protection: The Facts, The Figures, and The Fallout*, July 22, 2013, Forbes.com, available at <http://www.forbes.com/sites/mikepatton/2013/07/22/detroit-files-for-bankruptcy-protection-the-facts-the-figures-and-the-fallout/>.

187 See *Bankrupt Cities, Municipalities List and Map*, Updated: Dec. 3, 2013, Governing.com, available at <http://www.governing.com/gov-data/municipal-cities-counties-bankruptcies-and-defaults.html>. See also Mike Maciag, *How Rare are Municipal Bankruptcies?*, Jan. 24, 2013, Governing.com, available at <http://www.governing.com/blogs/by-the-numbers/municipal-bankruptcy-rate-and-state-law-limitations.html> (providing an overview of state laws governing municipal bankruptcy procedures).

188 Standard & Poor's, in a recent analysis of municipal finances, predicted that such bankruptcies would remain rare going forward. See Gabriel J. Petek et al., *Municipal Bankruptcy: Standard & Poor's Approach and Viewpoint*, Standard & Poor's (Oct. 4, 2012), available at http://www.standardandpoors.com/spf/upload/Ratings_US/Municipal_Bankruptcy.pdf.

189 There is also growing concern that the Detroit bankruptcy could set a troubling precedent for how municipalities treat bond holders during times of fiscal instability or insolvency. More specifically, Detroit is seeking to deprioritize repayment of outstanding bonds by classifying all holders of city debt as a single class of unsecured creditors. See Nathan Bomey, *Detroit to Battle Bondholders in Bankruptcy Court*, Feb. 19, 2014, *USA Today*, available at <http://www.usatoday.com/story/news/nation/2014/02/19/detroit-bankruptcy-bondholders-dispute/5601609/>. This has already raised bond prices for localities in Michigan. See Mary Williams Walsh, *Woes of Detroit Hurt Borrowing by its Neighbors*, Aug. 9, 2013, N.Y. Times. See also Mike Cherney, Kelly Nolan and Emily Glazer, *Detroit Rattles Muni Market*, Aug. 8, 2013, Wall St. Journal (reporting on how similar approaches to Detroit's water and sewer bonds are impacting the broader municipal bond market).

190 See Alicia H. Munnell and Laura Quinby, *Legal Constraints on Changes in Local and State Pensions*, Center for Retirement Research at Boston College, Issue in Brief No. 25 (Aug. 2012), available at http://crr.bc.edu/wp-content/uploads/2012/08/slp_25.pdf (providing an overview of these various legal protections).

191 See, e.g., *Who Pays the Bill?* July 27, 2013, *The Economist* ("Pension accounting is complicated. What is the cost today of a promise to pay a benefit in 2020 or 2030? The states have been allowed to discount that future liability at an annual rate of 7.5%-8% on the assumption that they can earn such returns on their investment portfolios. The higher the discount rate, the lower the liability appears to be and the less the states have to contribute upfront.").

of at least \$1 trillion and possibly as much as \$3 trillion.¹⁹² At the city level in particular, Pew has observed a “widening gap” between pension commitments and funding levels in 61 major cities across the United States.¹⁹³ This divide is compounded by similarly generous and legally protected commitments to fund healthcare for retirees. Pew notes that “unfunded liabilities for retiree healthcare loom even larger than for pensions.”¹⁹⁴

Beyond accelerating an avalanche of legacy costs for many cities and states, the Great Recession reminded citizens of the fragility of municipal finances and the fiscal interdependencies between local and state governments. City budgets are typically funded by a diverse mixture of tax revenues derived from individuals and businesses (e.g., sales, property, and income taxes), an assortment of fees and assessments, and state (and, to a more limited extent, federal) budget dollars. The extent to which a particular city or town relies on a certain source of income varies from municipality to municipality.¹⁹⁵ But, in general, about half of local budget revenues are derived from two primary sources: state budgets and property taxes.¹⁹⁶ Of the two, “states fund on average close to a third of local budgets.”¹⁹⁷ As a result, municipal budgets are subject to negative shocks whenever there is economic turbulence at the national, state, or local level.

Conversely, given the close economic relationship between cities and states, negative shocks at the local level can trickle up to the state level. One recent study of state budget crises that occurred in the wake of the recent recession concluded that distressed municipal finances in general are a “major threat” to the fiscal sustainability of the states.¹⁹⁸ In short, as much as some municipalities wish to be independent from the influence of state legislatures and governors, these entities remain closely linked economically and tend to rise and fall together. In the GONs context, this linkage is critical because, despite the attempts by some to underscore the importance of preserving some semblance of self-governance, states have significant vested interests in monitoring the economic health (along with numerous other aspects) of their political subdivisions.¹⁹⁹ Because a municipal broadband network represents a significant, long-term commitment of capital and assumption of debt, state governments have a major role to play when they implement GONs-related legal processes to guide the decision-making of local officials.²⁰⁰

192 *Id.* (quoting a report by Moody’s that these funds are 52% underfunded). See also Alicia H. Munnell et al., *The Funding of State and Local Pensions: 2012-2016*, Center for Retirement Research at Boston College, Issue in Brief No. 32 (July 2013), available at http://crr.bc.edu/wp-content/uploads/2013/07/slp_32.pdf (estimating that these funds are underfunded by 27 percent).

193 See *A Widening Gap in Cities: Shortfalls in Funding for Pensions and Retiree Health Care*, The Pew Charitable Trusts (Jan. 2013), available at http://www.pewtrusts.org/uploadedFiles/wwwpewtrustsorg/Reports/Retirement_security/Pew_city_pensions_report.pdf.

194 *Id.* at p. 2.

195 See, e.g., Gerald Prante, *Where do State and Local Government Get Their Tax Revenue?* Fiscal Fact No. 194, Tax Foundation (Oct. 2009), available at <http://taxfoundation.org/sites/taxfoundation.org/files/docs/ff194.pdf> (providing an overview of some of the primary sources of tax revenue in states across the country).

196 See, e.g., *The Local Squeeze: Falling Revenues and Growing Demand for Services Challenge Cities, Counties, and School Districts*, at 1, The Pew Charitable Trusts (June 2012), available at http://www.pewstates.org/uploadedFiles/PCS_Assets/2012/Pew_Cities_Local%20Squeeze_report.pdf (“Local Squeeze”).

197 *Id.* at 5.

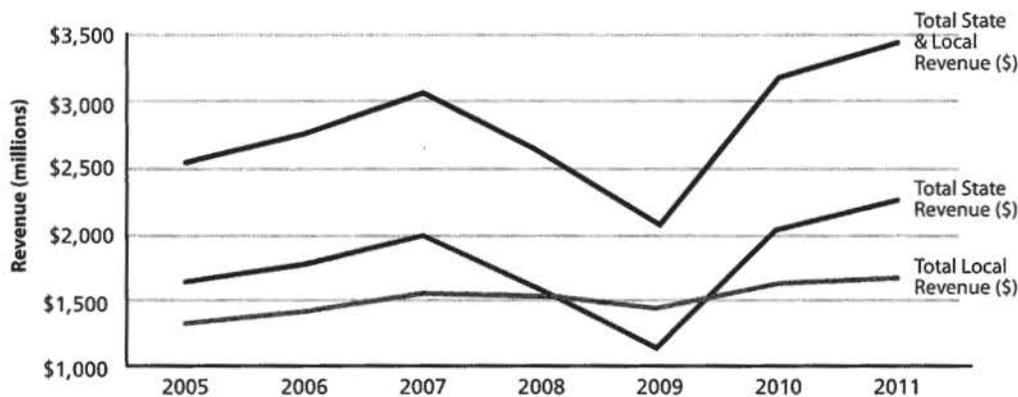
198 See *Report of the State Budget Crisis Task Force*, at p. 54-56, State Budget Crisis Task Force (July 2012), available at <http://www.statebudgetcrisis.org/wpcms/wp-content/images/Report-of-the-State-Budget-Crisis-Task-Force-Full.pdf> (“State Budget Crisis Task Force Report”).

199 The contours of these relationships, especially in the context of monitoring the economic health of municipalities, are evident in the array of responses to local fiscal crises that have occurred in recent years. Some states, like New Jersey, have implemented relatively comprehensive oversight of local finances. Other states, like Michigan, have demonstrated a willingness to intervene in local matters when the situation becomes dire. In the case of Detroit, for example, the state governor appointed an emergency manager to oversee city government in an effort to manage what had quickly become a financial disaster. Still other states, like Pennsylvania and California, have been faulted for implementing a more hands-off approach to monitoring its municipalities. Much of this criticism stems from several major municipal bankruptcies in these states over the last few years. See Mark J. Magyar, *Strict Fiscal Oversight Keeps New Jersey Cities Out of Bankruptcy*, July 22, 2013, N.J. Spotlight, available at <http://www.njspotlight.com/stories/13/07/21/strict-oversight-keeps-nj-cities-out-of-bankruptcy/?p=all>; Monica Davey, *Michigan Naming Fiscal Manager to Help Detroit*, March 1, 2013, N.Y. Times, available at http://www.nytimes.com/2013/03/02/us/michigan-appoints-emergency-manager-for-detroit.html?_r=0; Hillary Russ, *Analysis: Pennsylvania City’s Woes Fuel Debate on State Oversight*, July 15, 2012, Reuters, available at <http://www.reuters.com/article/2012/07/15/us-usa-scranton-crisis-idUSBRE86E07C20120715>.

200 To date, 19 states have enacted some type of law impacting the deployment of GONs. Many of these require municipalities to undertake comprehensive feasibility studies to ensure that the GON is economically viable. Very few have imposed outright bans on such networks.

While state and local revenues have improved (see Figure 3.2) and while progress has been made toward resolving many of the budget crises that had paralyzed state and local government in the recent past,²⁰¹ there is broad agreement that municipal finances in general remain unstable. Property and income tax collections have not grown in recent years, and growth in sales tax receipts remains tepid.²⁰² Any long-term drop in property tax revenues is especially critical because these receipts “make up more than two-thirds of total tax revenue for local governments as a whole and 100 percent of tax revenue for many school districts and counties.”²⁰³ Combined with other unfavorable conditions imposed on local governments by the Great Recession and its aftermath, many municipalities have been forced to slash budgets, dip into “rainy day” funds, or run deficits to continue providing core services to constituents.²⁰⁴ For these reasons, there have been significantly more municipal credit *downgrades* than upgrades over the last few years.²⁰⁵

Figure 3.2: State & Local Revenues: 2005–2011



Source: Census Bureau *State & Local Government Finances Summaries: 2005–2011*

Though critically important to municipalities in the short term, fleeting dips in revenues and cuts to budgets pale in importance to the deep structural shifts remaking local economies across the country. Over the last four years, public sector employment at the state and local levels has been decimated by spending freezes and budget cuts. Indeed, between January 2009 and February 2014, state and local governments cut over 650,000 jobs.²⁰⁶ The vast majority of these job losses—about 529,000—occurred at the local level.²⁰⁷ Such deep and consistent cuts have been significant contributors to a national unemployment rate remaining at historically

201 See, e.g., *The Fiscal Survey of States: An Update of State Fiscal Conditions*, A Report by the National Governors Association and the National Association of State Budget Offices (spring 2013), available at <http://www.nasbo.org/sites/default/files/Spring%202013%20Fiscal%20Survey%20of%20States.pdf> (noting that “After several years of slow recovery in the national economy, fiscal distress is finally beginning to subside for most states.” *Id.* at vii). But see Stephen Moore, *Christmas Comes Early for State Budgets*, July 6–7, 2013, *Wall St. Journal* (noting that recent increases in state tax revenues are likely to be fleeting and cautioning states to not overspend as a result lest they become embroiled in a “boom-and-bust” cycle of taxing and spending).

202 See Michael A. Pagano & Christiana McFarland, *City Fiscal Condition in 2013*, Research Brief on America’s Cities, National League of Cities (Oct. 2013), available at http://www.nlc.org/Documents/Find%20City%20Solutions/Research%20Innovation/Finance/Final_CFC2013.pdf.

203 *State Budget Crisis Task Force Report* at p. 54.

204 *Id.*

205 *Id.* at p. 56. See also Priscilla Hancock, *Navigating the Municipal Market in 2013: Curb your Enthusiasm*, at p. 1, J.P. Morgan Investment Insights (March 2013), available at https://www.jpmorganfunds.com/blobcontent/48/731/1323356438694_II-MUNI-SPRING13.pdf (“Since the recession, credit downgrades have consistently exceeded credit upgrades by a significant margin, and no sector of the market has been spared.”).

206 See *State and Local Government Employment: Monthly Data (as of March 7, 2014)*, *Governing.com*, available at <http://www.governing.com/gov-data/public-workforce-salaries/monthly-government-employment-changes-totals.html>.

207 *Id.*

high levels since the end of 2008.²⁰⁸ Elevated levels of unemployment, coupled with a large pool of people who have given up looking for work, depress tax collections and property taxes, which in turn feeds into budget instability and creates considerable economic uncertainty.

In many instances, private sector job losses stemmed directly from the evisceration of industries that played essential roles in local economies for decades. Although some of these jobs (e.g., construction employment) reemerged in tandem with the revitalization of a particular sector (e.g., housing), there is broad agreement among economists and labor experts that many of the jobs that were lost as a result of the recession are unlikely to return.²⁰⁹ The manufacturing sector, which has been shedding jobs for decades, is typically cited as the leading example of an industry that has suffered irreparable damage over the last few years.²¹⁰ Plant closings, staff reductions, and hiring and wage freezes contributed to significant turnover in this sector.²¹¹ Such medium- and high-paying positions, which were once considered safe and reliable and thus capable of supporting families and communities for generations, have not rebounded during the recovery and have instead been replaced by mostly low-wage positions.²¹² Overall, “more than half of all U.S. metro areas won’t regain the jobs lost in the recession until the second half of 2015 or later.”²¹³

3.2.1.1 Observations

Using these dire economic conditions as an opportunity, some advocate in favor of municipal broadband networks by framing them as a critical input for jump-starting economic development.²¹⁴ The rationale offered to policy makers, local businesses, and residents typically includes the assumption that the new GON will enable a particular city, town, or region to create its own high-tech start-up community or to attract a range of new businesses.²¹⁵ The substantial upfront costs to build and maintain these networks are justified by proponents in light of the many benefits—new sectors, new jobs, and higher wages among them—that are promised to flow from the GON once fully deployed.²¹⁶

There is disagreement among researchers as to whether a new municipal broadband network can revive or remake a local economy. While substantial empirical evidence indicates broadband and broadband-enabled

208 See Bureau of Labor Statistics, Unemployment Rate, <http://data.bls.gov/timeseries/LNS14000000>. For additional discussion of state and local government employment losses, see Lucy Dadayan and Donald J. Boyd, *The Depth and Length of Cuts in State-Local Government Employment is Unprecedented*, Rockefeller Institute of Government at SUNY Albany, Issue Brief (Jan. 2013), available at http://www.rockinst.org/pdf/government_finance/2013-01-09-State-Local_Government_Employment.pdf.

209 See, e.g., Bernard Condon and Paul Wiseman, *Recession, Tech Kill Middle-Class Jobs*, Jan. 23, 2013, Associated Press, available at <http://news.yahoo.com/ap-impact-recession-tech-kill-middle-class-jobs-051306434--finance.html>.

210 Between 1980 and 2005, this sector lost about a quarter of its overall workforce. This translates to about 4.5 million job losses. See Patricia Atkins et al., *Responding to Manufacturing Job Loss: What Can Economic Development Policy Do?*, Metropolitan Policy Program at Brookings (June 2011), available at http://www.brookings.edu/~media/research/files/papers/2011/6/manufacturing%20job%20loss/06_manufacturing_job_loss.pdf.

211 This sector has lost well over two million jobs since the recession. For an overview of historical data, see Bureau of Labor Statistics, Manufacturing Employment Data, <http://data.bls.gov/timeseries/CES3000000001>.

212 See Brad Plummer, *How the Recession Turned Middle-Class Jobs into Low-Wage Jobs*, Feb. 28, 2013, Wash. Post Wonkblog, available at <http://www.washingtonpost.com/blogs/wonkblog/wp/2013/02/28/how-the-recession-turned-middle-class-jobs-into-low-wage-jobs/> (reporting on data and analysis released by the Federal Reserve Bank of San Francisco).

213 See Tim Mullaney, *Many Cities Face Long Wait to Regain Lost Jobs*, June 26, 2013, USA Today, available at <http://www.usatoday.com/story/money/business/2013/06/26/metro-areas-slow-jobs-recovery-since-recession/2453419/> (reporting on data and analysis released by the U.S. Conference of Mayors).

214 See, e.g., THE POLITICS OF ABUNDANCE; *Community Broadband Creates Jobs*, Institute for Local Self-Reliance Fact Sheet, available at <http://muninetworks.org/sites/www.muninetworks.org/files/fact-sheet-econ-dev.pdf> (“Community Broadband Creates Jobs”); *Missing Our Gigabit Opportunity?*, Aug. 5, 2013, Gig.U Blog, available at <http://www.gig-u.org/blog/missing-our-gigabit-opportunity>.

215 See, e.g., Mark Riffe, *Silicon Valley, Seattle...Chattanooga? Tennessee’s ‘Gig City’ Woos Geeks*, Nov. 22, 2011, Wired, available at <http://www.wired.com/business/2011/11/chattanooga-gigabit-network/>; John Eligon, *Tech Start Ups Find a Home on the Prairie*, Nov. 21, 2012, N.Y. Times, available at http://www.nytimes.com/2012/11/22/us/silicon-prairie-takes-root-in-the-great-plains.html?_r=0 (reporting on how cities in the Midwest are attempting to rebrand themselves as part of the “Silicon Prairie”).

216 See, e.g., *Business Case for Government Fiber* (“To make the case for investing in a government-owned fiber network, many communities define ROI more broadly and consider the “beyond the balance sheet” benefits that such a network would deliver.”).

services create jobs and spur economic development in the United States,²¹⁷ there is little, if any, direct empirical evidence that GONs specifically have similar impacts on employment.²¹⁸ There is also robust discussion as to whether the presence of an ultra-high-speed broadband network will create new jobs and support new industries.²¹⁹ With numerous broadband options already widely available throughout the country, the introduction of a municipal supplier, even one that offers faster speeds in its locality, is unlikely on its own to transform the local economy. Indeed, a growing body of research indicates that the availability of broadband appears to be just one of many factors that impact local economic development.²²⁰

In the context of GONs that are positioned as essential to supporting the growth of a new high-tech sector, it must be recognized that competition for employment in the Internet ecosystem is very intense. Many of the industries that have been built online are surrounded by very high barriers to entry. To thrive, new firms require significant investment capital, as well as workers with specialized computer and digital literacy skills.²²¹ And unlike traditional economic hubs (e.g., the local industrial plant), start-ups and other digital firms often prefer to import talent from other states and countries rather than train new workers.²²² In addition, firms in this space tend to employ only a small number of people.²²³

217 Numerous studies conducted over the last decade have examined the many economic and employment impacts of high-speed Internet connectivity on the U.S. economy. A representative sampling of these includes: Robert Crandall et al., *The Effect of Ubiquitous Broadband Adoption on Investment, Jobs, and the U.S. Economy*, New Millennium Research Council (Sept. 2003), available at http://newmillenniumresearch.org/archive/bbstudyreport_091703.pdf; William Lehr et al., *Measuring Broadband's Economic Impact*, Paper presented at TPRC (Jan. 2006), available at http://www.andrew.cmu.edu/user/sirbu/pubs/MeasuringBB_EconImpact.pdf; Robert Crandall et al., *The Effects of Broadband Deployment on Output and Employment: A Cross-sectional Analysis of U.S. Data*, Brookings Institute (Nov. 2007), available at <http://www.brookings.edu/views/papers/crandall/200706litan.pdf>; *The Economic Impact of Stimulating Broadband Nationally*, Connected Nation (Feb. 2008), available at http://www.connectednation.org/_documents/connected_nation_eis_study_full_report_02212008.pdf; Roger Enter, *The Increasingly Important Impact of Wireless Broadband Technology and Services on the U.S. Economy*, White Paper for CTIA – The Wireless Association (May 2008), available at http://files.ctia.org/pdf/Final_OvumEconomicImpact_Report_5_21_08.pdf (updating a 2005, which is available at http://files.ctia.org/pdf/Report_OVUM_Economy.pdf); *Economic Impact of Broadband: An Empirical Study*, LECG (Feb. 2009), available at http://www.connectivityscorecard.org/images/uploads/media/Report_BroadbandStudy_LECG_March6.pdf; Mark Dutz et al., *The Substantial Consumer Benefits of Broadband Connectivity for U.S. Households*, Compass Lexecon/Internet Innovation Alliance (July 2009), available at http://internetinnovation.org/files/special-reports/CONSUMER_BENEFITS_OF_BROADBAND.pdf; Jed Kolko, *Does Broadband Boost Local Economic Development?*, Public Policy Institute of California (Jan. 2010), available at http://www.ppic.org/content/pubs/report/r_110jkr.PDF (finding a “positive relationship between broadband expansion and economic growth,” but cautioning that the “economic benefits to residents appear to be limited.”); Robert Crandall & Hal Singer, *The Economic Impact of Broadband Investment*, Broadband for America (Feb. 2010), available at http://www.broadbandforamerica.com/sites/default/themes/broadband/images/mail/broadbandforamerica_crandall_singer_final.docx; *The 2012 Jobs and Broadband Report*, Connected Nation (May 2012), available at http://www.connectednation.org/sites/default/files/cn_biz_whitepaper2012_final.pdf; Hanns Kuttner, *Broadband for Rural America: Economic Impacts and Economic Opportunities*, Hudson Institute (Oct. 2012), available at <http://www.hudson.org/files/publications/RuralTelecom-Kuttner--1012.pdf>.

218 Analyses in sections 4 and 5, *infra*, address some of the job creation claims made by GONs advocates.

219 See, e.g., Julius Genachowski, *Faster, Sooner: Why the U.S. Needs 'Gigabit Communities'*, Jan. 18, 2013, *Forbes.com*, available at <http://www.forbes.com/sites/ciocentral/2013/01/18/faster-sooner-why-the-u-s-needs-gigabit-communities/> (providing an example of the irrational exuberance that often surrounds talk of “gigabit communities”).

220 See, e.g., Jonathan Bowles and David Giles, *New Tech City*, Center for an Urban Future (May 2012), available at http://nycfuture.org/pdf/New_Tech_City.pdf (identifying numerous other factors impacting the creation and long-term viability of New York City's still-emerging high-tech sector) (“*New Tech City*”). For further analysis of claimed economic and employment impacts of GONs, see *infra*, sections 5.4 and 5.8.

221 See, e.g., *id.* (discussing the inputs required to sustain New York City's fledgling start-up sector).

222 The composition of Silicon Valley's high-tech workforce is often cited as an example of a high-tech cluster that does not reflect the composition of its surrounding areas. The high tech sector's recent push to reform national immigration laws also reflects a feeling that the domestic supply of qualified high tech workers is lacking. See, e.g., Rebecca Greenfield, *Blacks and Hispanics Aren't Thriving in Silicon Valley's Meritocracy*, Feb. 7, 2013, *The Atlantic Wire*, available at <http://www.theatlanticwire.com/technology/2013/02/blacks-and-latinos-arent-thriving-silicon-valleys-meritocracy/61890/> (reporting on minority underemployment in Silicon Valley); Eric Lipton and Somini Sengupta, *Latest Product From Tech Firms: An Immigration Bill*, May 5, 2013, *N.Y. Times* (reporting on the sector's recent push to reform national immigration laws to facilitate the importation of skilled tech workers).

223 Facebook employs less than 5,000 people. Google employs just over 44,000. AT&T has over 245,000 employees, while General Electric has well over 300,000. This data is available at www.finance.yahoo.com.

3.2.2 Infrastructure Challenges

In stark contrast to the robust U.S. broadband market, basic public infrastructure in the United States is suffering. There exist numerous examples of failing roads, bridges, dams, the electric grid, and other core public sector infrastructure across the nation. The box below provides just a few recent examples.

Examples of Major Infrastructure Failures: 2003–Present

2003 Northeast Blackout

- A sagging high-voltage line touching an overgrown tree set off a cascading failure of much of the Northeast United States' electric grid in August 2003. Fifty million people across eight states and parts of Canada were impacted, causing billions of dollars in lost economic activity and highlighting the fragile and antiquated nature of the nation's electric grid.²²⁴

Failure of Levees during Hurricane Katrina

- Hurricane Katrina exposed in dramatic fashion decades of neglect by local, state, and federal government entities in maintaining and updating the levee system in New Orleans to protect against more powerful storms. The storm damaged about half of all the protective structures in the city, contributing to widespread flooding that resulted in hundreds of deaths and tens of billions of dollars in property damage and lost economic activity.²²⁵

Major Bridge Failures in Minnesota and Washington

- In 2007, a bridge collapse in Minneapolis, Minnesota, resulted in the deaths of 13 people. The ultimate cause of the failure was an inability to adjust the design of the bridge to reflect ad hoc improvements to it over many decades. The original design of the bridge was "lighter and less expensive to build, but has gradually fallen out of favor with highway departments."²²⁶
- In 2013, the partial collapse of a bridge in Mount Vernon, Washington, was attributed to an outdated design. Prior to the failure, the bridge was listed as "fracture critical" and "functionally obsolete."²²⁷

Dam Failures and Near-Failures in the United States

- Between June 2005 and June 2013, there were 173 dam failures and 587 "episodes that, without intervention, would likely have resulted in dam failure."²²⁸

224 See, e.g., JR Minkel, *The 2003 Northeast Blackout – Five Years Later*, Aug. 13, 2008, Scientific American, available at <http://www.scientificamerican.com/article.cfm?id=2003-blackout-five-years-later>; Charles M. Davidson & Michael J. Santorelli, *Realizing the Smart Grid Imperative: A Framework for Enhancing Collaboration Between Energy Utilities and Broadband Service Providers*, at p. 7-8, Time Warner Cable Research Program on Digital Communications (summer 2011), available at http://www.twcresearchprogram.com/pdf/TWC_Davidson.pdf ("Realizing the Smart Grid Imperative").

225 See *Performance Evaluation of the New Orleans and Southeast Louisiana Hurricane Protection System: Draft Final Report of the Interagency Performance Evaluation Task Force*, Vol. I – Executive Summary and Overview, U.S. Army Corps of Engineers (June 2006), available at http://www.nytimes.com/packages/pdf/national/20060601_ARMYCORPS_SUMM.pdf; *A Failure of Initiative: Final Report of the Select Bipartisan Committee to Investigate the Preparation for and Response to Hurricane Katrina*, at p. 87-97, U.S. House of Representatives (Feb. 2006), available at <http://www.c-span.org/pdf/katrinareport.pdf>.

226 See, e.g., Matthew L. Wald, *Faulty Design Led to Bridge Collapse, Inquiry Finds*, Jan. 15, 2008, N.Y. Times, available at <http://www.nytimes.com/2008/01/15/washington/15bridge.html>.

227 See, e.g., Marisol Bello, *Bridge Collapse Shines Light on Aging Infrastructure*, May 24, 2013, USA Today, available at <http://www.usatoday.com/story/news/nation/2013/05/24/washington-bridge-collapse-nations-bridges-deficient/2358419/>.

228 See Association of State Dam Safety Officials, *Dam Failures and Incidents*, <http://www.damsafety.org/news/?p=412f29c8-3fd8-4529-b5c9-8d47364c1f3e>.

Appreciating the scale and scope of these particular failures, and the poor condition of U.S. infrastructure in general, should inform any discussion regarding how and where to allocate scarce public funding. In some cases, major natural disasters (e.g., historic hurricanes and floods) exposed underlying weaknesses in infrastructure that had not been updated or properly maintained for decades. In other cases, aged infrastructure failed due to neglect by public officials. Regardless of the particular circumstances that contributed to a fatal failure or near-failure, the common thread throughout is significant under-investment of public resources in shoring up what remains the foundation of modern commerce.

There is little dispute that government should invest public resources in building and maintaining basic infrastructure like roads, bridges, dams, and ports. This has been a core function of government at every level for centuries.²²⁹ And for many decades, especially in the middle part of the 20th century, these investments were significant and typically represented several percentage points of annual GDP.²³⁰ Beyond hastening the modernization of many aspects of American life, these investments consistently generated significant gains in productivity, economic output, and job creation.²³¹ But for many reasons, overall spending on public infrastructure in the U.S. has steadily decreased over the last few decades.²³² There is a widening gap between the amount spent each year on maintaining critical infrastructure and the amount needed to repair and modernize it. The result is crumbling roads, failing bridges, faulty dams, a fragile electric grid, inadequate ports, and decaying water systems.

This downward spiral has been chronicled by the American Society of Civil Engineers (ASCE). Since 1998, this group has assigned letter grades to various aspects of public infrastructure throughout the United States in an effort to draw attention to the funding gaps and public neglect that are causing such decay. Table 3.13 provides an overview of its findings from 1998 through 2013. These grades paint an ominous picture of infrastructure in the U.S., where little progress has been made in shoring up many of the key areas identified. This is made clear by a cumulative “GPA” that has barely risen in 15 years and an investment gap that has nearly tripled over the last 12 years.

The dire conditions described by these results and the many aspects of the U.S. infrastructure crisis have been further fleshed out in other data released in the last few years. A 2013 analysis by *USA Today*, for example, found that only 38 percent of roads in the U.S. are in “good” condition.²³³ Transportation for America recently reported that about 11 percent of U.S. bridges remain “structurally deficient” and require “significant maintenance, rehabilitation, or replacement.”²³⁴

These data gain additional relevance and primacy when translated into economic impacts. Failure to modernize and strengthen U.S. transportation hubs, for example, has created bottlenecks and congestion that cost the country around \$200 billion each year.²³⁵ Similarly, with “42 percent of America’s major urban highways ... congested” due to chronic under-investment, the U.S. economy loses about \$101 billion each annually in “wasted time and fuel.”²³⁶ It is also estimated that “deficient and deteriorating [mass] transit systems cost the

229 For an historical analysis, see John Williamson, *Federal Aid to Roads and Highways Since the 18th Century: A Legislative History*, Congressional Research Service (Jan. 6, 2012), available at <http://www.fas.org/sgp/crs/misc/R42140.pdf>.

230 See, e.g., Chris Edwards, *Infrastructure Investment: A State, Local, and Private Responsibility*, Cato Institute Tax & Budget Bulletin No. 67 (Jan. 2013), available at http://www.cato.org/sites/cato.org/files/pubs/pdf/tbb_067.pdf (providing an historical overview of public and private investment in U.S. infrastructure) (“*Infrastructure Investment: A State, Local, and Private Responsibility*”).

231 See, e.g., *A New Economic Analysis of Infrastructure Investment*, Report Prepared by the Department of Treasury with the Council of Economic Advisers (March 23, 2012), available at <http://www.treasury.gov/resource-center/economic-policy/Documents/20120323InfrastructureReport.pdf> (providing data regarding the economic impact of public infrastructure investment) (“*New Economic Analysis of Infrastructure Investment*”).

232 See, e.g., *Falling Apart and Falling Behind*, Transportation Infrastructure Report 2012, Building America’s Future (March 2012), available at <http://www.bafuture.org/pdf/Building-Americas-Future-2012-Report-32013.pdf> (examining recent trends in infrastructure investment and highlighting shortcomings) (“*Falling Apart and Falling Behind*”).

233 See Gary Stoller, *U.S. Roads, Bridges are Decaying Despite Stimulus Influx*, July 29, 2013, *USA Today*, available at <http://www.usatoday.com/story/news/nation/2013/07/28/roads-bridges-decaying/2594499/> (“*U.S. Roads, Bridges are Decaying*”).

234 See *The Fix We’re in For: The State of Our Nation’s Bridges 2013*, Transportation for America, available at <http://t4america.org/docs/bridgereport2013/2013BridgeReport.pdf>.

235 *Falling Apart and Falling Behind* at p. 11.

236 See ASCE 2013 Infrastructure Report Card, Roads, <http://www.infrastructurereportcard.org/a/#p/roads/overview>.

U.S. economy \$90 billion in 2010,²³⁷ while underinvestment in inland waterways throughout the country “cost American businesses \$33 billion in 2010.”²³⁸ An increasing number of power outages and other problems with the U.S. electric grid cost the economy about \$150 billion each year.²³⁹

Table 3.13: Summary of ASCE Infrastructure Report Cards: 1998–2013

	ASCE Grades				
	1998	2001	2005	2009	2013
Aviation	C-	D	D+	D	D
Bridges	C-	C	C	C	C+
Dams	D	D	D	D	D
Drinking Water	D	D	D-	D-	D
Energy	n/a	D+	D	D+	D+
Hazardous Waste	D-	D+	D	D	D
Mass Transit	C	C-	D+	D	D
Navigable Waterways	n/a	D+	D-	n/a	n/a
— Inland Waterways	n/a	n/a	n/a	D-	D-
— Levees	n/a	n/a	n/a	D-	D-
— Ports	n/a	n/a	n/a	n/a	C
Public Parks and Recreation	n/a	n/a	C-	C-	C-
Rail	n/a	n/a	C-	C-	C+
Roads	D-	D+	D	D-	D
Schools	F	D-	D	D	D
Solid Waste	C-	C+	C+	C+	B-
Waste Water	D+	D	D-	D-	D
Cumulative GPA	D	D+	D	D	D+
Investment Gap	n/a	\$1.3 trillion*	\$1.6 trillion*	\$2.2 trillion*	\$3.6 trillion**

Source: ASCE Report Cards – 1998, 2001, 2005, 2009, 2013

*Estimated five-year need

**Investment needed by 2020

Conversely, numerous positive economic impacts are expected to flow from improvements to these aspects of U.S. infrastructure. Job creation, for example, has long been tied to increases in infrastructure spending. By one estimate, a \$1 billion investment in infrastructure “creates more than 25,000 jobs at construction sites and factories producing needed raw materials.”²⁴⁰ More broadly, McKinsey estimates that increasing infrastructure spending by one percent of GDP would “translate into ... 1.5 million [direct and indirect jobs]” in the United

237 See ASCE 2013 Infrastructure Report Card, Transit, <http://www.infrastructurereportcard.org/a/#p/transit/overview>

238 See *Crying Out for Dollars*, Feb. 2, 2013, *The Economist* (reporting data and estimates by ASCE).

239 See Brad Plumer, *Bad News: The U.S. Power Grid is Getting Pricier, Less Reliable*, March 8, 2013, Wash. Post Wonkblog, available at <http://www.washingtonpost.com/blogs/wonkblog/wp/2013/03/08/surprise-the-u-s-power-grid-is-getting-pricier-less-reliable/> (reporting on data analyses from a variety of sources). See also *Economic Benefits of Increasing Electric Grid Resilience to Weather Outages*, Executive Office of the President of the United States (Aug. 2013), available at http://energy.gov/sites/prod/files/2013/08/f2/Grid%20Resiliency%20Report_FINAL.pdf (providing data and observations regarding the significant costs that stem from weather-related power outages).

240 *Falling Apart and Falling Behind* at p. 5.

States.²⁴¹ Similarly, investments aimed at increasing the capacity of transportation networks—mass transit, inland waterways, freight and rail systems, and ports—are projected to not only generate new jobs, but also contribute to increased economic activity by, for instance, allowing the U.S. to become a more attractive conduit for shipping goods.²⁴²

These benefits are also expected to trickle down to the consumer level. Improving roads and bridges, building new transit systems, and boosting the efficiency of air travel will alleviate congestion and help consumers increase productivity (e.g., by not being stuck in traffic for as long or having as many flights delayed) and save money on fuel.²⁴³ Improvements to the electric grid, including the introduction of “smart grid” technologies and services, are also expected to generate significant consumer welfare gains in the form of greater efficiency, more control over consumption, fewer outages, and lower rates.²⁴⁴

Closing investment gaps, reversing the long-term trend of ambivalence toward public infrastructure, and realizing the many benefits discussed above, however, will be challenging. Increasing public funding for these purposes will be difficult in the current political and fiscal environment, especially in light of imperatives to balance budgets and cut spending in both the short term and long term.²⁴⁵ Compounding these difficulties are fundamental disagreements over the proper role of public funding for infrastructure projects going forward. Recent proposals for a national infrastructure bank, for example, acknowledge the heavy burden on state and local finances that increased spending on public infrastructure would have on already strained budgets, as well as shortcomings in existing federal funding mechanisms (e.g., the Highway Trust Fund).²⁴⁶ A national infrastructure bank is thus seen as one way to help plug gaps by increasing federal infrastructure funding and using those funds to leverage additional private-sector participation in this endeavor.²⁴⁷

Alternatively, there have been calls for new policies that would increase private investment and participation in improving infrastructure. In recent years, private investment has dwarfed public spending on infrastructure: “private infrastructure spending—on factories, warehouses, freight rail, pipelines, refineries, and many other items—is about four times larger than federal, state, and local government infrastructure spending combined” and about five times larger if “defense spending is excluded.”²⁴⁸ Some remain skeptical of relying on the private sector to continue driving infrastructure spending, but, overall, there is broad bipartisan support for tapping into the economic incentives that drive such investment and using them to forge public-private partnerships (PPPs) in this context.²⁴⁹ These arrangements are seen as optimal vehicles for addressing the U.S. infrastructure crisis given their track record of success in leveraging limited public dollars, along with private incentives and

241 See Richard Dobbs et al., *Infrastructure Productivity: How to Save \$1 trillion a Year*, at p. 4, McKinsey Global Institute (Jan. 2013), available at http://www.mckinsey.com/~media/McKinsey/dotcom/Insights%20and%20pubs/MGI/Research/Urbanization/Infrastructure%20productivity/MGI_Infrastructure_Full_report_Jan2013.ashx.

242 See, e.g., *Falling Apart and Falling Behind*.

243 See, e.g., *New Economic Analysis of Infrastructure Investment* at p. 18-20.

244 See, e.g., *Realizing the Smart Grid Imperative* (discussing the many benefits expected to flow from the broadband-enabled smart grid).

245 See, e.g., Peter Baker and John Schwartz, *Obama Pushes Plan to Build Roads and Bridges*, March 29, 2013, N.Y. Times, available at http://www.nytimes.com/2013/03/30/us/politics/obama-promotes-ambitious-plan-to-overhaul-nations-infrastructure.html?_r=0 (detailing recent infrastructure spending proposals by President Obama and the political response by federal policy makers).

246 See, e.g., William A. Galston and Korin Davis, *Setting Priorities, Meeting Needs: The Case for a National Infrastructure Bank*, at p. 3-4, Governance Studies at Brookings, Brookings Institution (Dec. 2012), available at http://www.brookings.edu/~media/Research/Files/Papers/2012/12/13%20infrastructure%20galston%20davis/1213_infrastructure_galston_davis.pdf (“*Setting Priorities, Meeting Needs*”).

247 See, e.g., Douglas W. Elmendorf, *Infrastructure Banks and Surface Transportation*, Congressional Budget Office (July 2012), available at <http://www.cbo.gov/sites/default/files/cbofiles/attachments/07-12-12-InfrastructureBanks.pdf> (discussing how a national infrastructure bank would work).

248 *Infrastructure Investment: A State, Local, and Private Responsibility* at p. 1.

249 See, e.g., *Setting Priorities, Meeting Needs* at p. 2 (rationalizing that increasing federal government spending will help to forge partnerships that fund projects “on the basis of economic and social benefit, not political gain.”).

expertise, to realize mutually beneficial goals.²⁵⁰ PPPs are already popular among municipalities seeking to bolster local infrastructure (e.g., replacing a bridge²⁵¹) or otherwise tap into the expertise of private sector firms (and individuals) to realize efficiencies and cost savings in numerous other instances.²⁵² (The use of PPPs in the context of broadband deployment is discussed in section 6.)

3.2.2.1 Observations

When some GONs proponents address the details of how a municipality might fund deployment of the municipal network,²⁵³ a proposed broadband system is often cast as a modern-day utility that, like any utility, will require substantial and ongoing commitments of public dollars and close regulatory oversight to ensure certain pre-determined outcomes.²⁵⁴ One rationale offered in support provides that, by taking ownership of broadband, the town or city will be able to “prioritize community needs, not distant shareholder desires.”²⁵⁵ Much confidence is placed in municipal business dealings, a sentiment tied directly to the notion that the primary mission of government is to “maximize the general welfare.”²⁵⁶ Implicit in this reasoning is optimism in the ability of local government to simply increase spending on what is deemed to be essential public infrastructure.²⁵⁷

The current state of the nation’s public infrastructure, as well as a history of failed and failing GONs, predicts that, over the long run, government-owned broadband systems will likely suffer the same fate of other public infrastructure—stagnation, underinvestment, and public neglect. The investment gap for public infrastructure has nearly tripled over the last 10 years, while private investment in broadband has surged, casting doubt on the notion that government is better positioned to steer this market going forward.

The enthusiastic embrace of PPPs generally and in the broadband space specifically signals recognition among public and private stakeholders that government will play increasingly redefined roles in the infrastructure context going forward. Ongoing efforts to rein in government spending, balance budgets, and restructure

250 For examples of how to structure successful PPPs, see, e.g., Eric Boyer et al., *Public-Private Partnerships and Infrastructure Resilience: How PPPs Can Influence More Durable Approaches to U.S. Infrastructure*, U.S. Chamber of Commerce, National Chamber Foundation (Jan. 2012), available at <http://emerging.uschamber.com/sites/default/files/PPPs%20and%20Infrastructure%20-%20NCF.pdf> (identifying the many efficiencies that flow from properly structured and executed PPPs); Eduardo Engel et al., *Public-Private Partnerships to Revamp U.S. Infrastructure*, Discussion Paper 2011-02, The Hamilton Project, Brookings (Feb. 2011), available at http://www.brookings.edu/~media/Research/Files/Papers/2011/2/partnerships%20engel%20fischer%20galetovic/02_partnerships_engel_fischer_galetovic_paper.PDF (same); Mark Perlman and Julia Pulidindi, *Public-Private Partnerships for Transportation Projects*, Municipal Action Guide, National League of Cities (May 2012), available at <http://www.nlc.org/File%20Library/Find%20City%20Solutions/Research%20Innovation/Infrastructure/public-private-partnerships-for-transportation-projects-mag-may12.pdf> (discussing the many merits of PPPs in the context of transportation projects); Emilia Istrate and Robert Puentes, *Moving Forward on Public Private Partnerships: U.S. and International Experience with PPP Units*, Brookings-Rockefeller Project on State and Metropolitan Innovation (Dec. 2011), available at http://www.brookings.edu/~media/research/files/papers/2011/12/08%20transportation%20istrate%20puentes/1208_transportation_istrate_puentes.pdf (same); *For the Good of the People: Using Public-Private Partnerships to Meet America’s Essential Needs*, at 4, National Council for Public-Private Partnerships (2002), available at <http://www.ncppp.org/presskit/ncpppwhitepaper.pdf> (providing a general overview of and introduction to how PPPs might be used in a variety of contexts).

251 There are numerous examples of PPPs that have been structured around replacing or modernizing a bridge. See, e.g., Martin Z. Braun & Freeman Klopott, Kiewit, *Macquarie Picked to Lead Goethals Bridge Project*, April 25, 2013, Bloomberg, available at <http://www.bloomberg.com/news/2013-04-24/kiewit-said-to-be-selected-to-lead-new-goethals-bridge-project.html> (providing details of a \$1.5 billion PPP to replace an aging bridge connecting New York and New Jersey); *A River Runs Through It*, March 2, 2013, The Economist (discussing a PPP to replace a bridge connecting Indiana and Kentucky). See also *A Question of Trust*, May 12, 2012, The Economist (providing an overview of a program in Chicago that was designed to “match public infrastructure needs to private investors on a case-by-case basis”).

252 An interesting new variant of the traditional PPP at the city level is the collaboration between city agencies and individuals (or firms) to put digital data to value-enhancing uses. See, e.g., Ben Kesling, *Better Living Through Hacking*, Aug. 13, 2013, Wall St. Journal (profiling a program in Chicago to engage hackers and other computer experts in an effort to “sift through volumes of unorganized [city] data and turn it into useful information”).

253 See, e.g., *Business Case for Government Fiber*.

254 The public utility argument in the broadband context has been made for many years. Indeed, it was echoed in the open access debate in the early 2000s and was at the center of the debate over network neutrality. These issues were discussed in section 2, *supra*.

255 *Averting the Looming Broadband Monopoly* at p. 7.

256 *Id.*

257 See, e.g., CAPTIVE AUDIENCE (calling for the creation of a broadband infrastructure bank).

entitlements, will make it difficult, if not impossible, in the near term to fund discrete projects or support a national infrastructure bank.²⁵⁸ And to the extent that funding is made available for investment in public works, data from the ASCE and elsewhere support the need to use these resources to address crumbling roads and failing bridges first and foremost, either directly or via PPPs. As such, the confidence that GONs advocates have in the public sector to fix what they see as a failing broadband market is misplaced.²⁵⁹

3.3 Takeaways

The data-based analyses included in this section support several important takeaways that are relevant to the GONs debate.

First, the broadband sector in the United States is healthy. The historical data and analyses provided in section 3.1 demonstrate that the availability of different suppliers and the overall supply of broadband in the United States continue to improve year after year. Such forward progress signifies the success of a “light touch” bipartisan regulatory model that has placed consumer demand as the primary driver of competition and innovation in the broadband market.²⁶⁰

Second, despite these gains, the U.S. broadband market remains far from perfect. On the supply side, challenges remain in developing sustainable network deployment models in unserved areas. On the demand side, key user groups, including senior citizens, people with disabilities, and low-income households, continue to have low rates of broadband adoption relative to other groups. Similarly, a number of legal and regulatory barriers impede broadband diffusion across critical sectors like energy, education, and healthcare.

In light of these challenges, the conditions are ripe for targeted government interventions, which might include—

- Supporting broadband training programs;²⁶¹
- Targeting subsidies for under-adopting groups where affordability may be an issue;²⁶²
- Rolling back legacy regulations impacting the deployment of broadband to rural and unserved parts of the country;²⁶³
- Forging PPPs with expert firms and nonprofits to realize well-defined goals on both the supply side and demand side;²⁶⁴ and
- Addressing the dozens of unique barriers impacting adoption decisions in under-adopting user communities and sectors of the economy.²⁶⁵

258 See, e.g., Philip Bump, *Obama Calls for Infrastructure Funding – for Fifth Time in Five Years*, March 29, 2013, *The Atlantic Wire*, available at <http://www.theatlanticwire.com/politics/2013/03/obama-calls-infrastructure-spending-fifth-time-five-years/63696/> (chronicling repeated failed attempts by the president to rally support for increases in federal infrastructure spending).

259 *Evaluating the Rationales for Government-Owned Broadband Networks* at p. 1 (noting that GONs advocates “view local government as a collective *deus ex machina* needed to revitalize a flagging broadband sector”).

260 See, e.g., Gerald R. Faulhaber and David J. Farber, *The Open Internet: A Customer-Centric Framework*, 4 *International Journal of Communication* 302-342 (2010) (discussing the customer-centric regulatory framework that has long prevailed in the broadband space and arguing against the imposition of additional rules and requirements); Jeffrey A. Eisenach, *Broadband Competition in the Internet Ecosystem*, American Enterprise Institute (Oct. 2012), available at http://www.aei.org/files/2012/10/17/-broadband-competition-in-the-internet-ecosystem_164734199280.pdf (discussing the interplay of regulation and competition in the Internet ecosystem).

261 Local and state governments in particular are well positioned to assist in these endeavors. See *infra*, section 6, for additional discussion.

262 The FCC is currently contemplating how to shift subsidies for telephone service to cover broadband. See *In the Matter of Lifeline and Link Up Reform and Modernization*, Report and Order and Further Notice of Proposed Rulemaking, FCC 12-11, 27 FCC Rcd 6656 (rel. Feb. 6, 2012) (adopting a variety of reforms to these ends and calling for additional comment on additional proposed changes).

263 For an overview of these efforts to date, see Sherry Lichtenberg, *Telecommunications Deregulation: Updating the Scorecard for 2013*, NRRI (May 2013), available at <http://nrri.org/documents/317330/0e3a5988-6f57-492d-8ce5-70926cfe68f4> (“*Telecommunications Deregulation: Updating the Scorecard for 2013*”).

264 See *infra*, section 6, for additional discussion.

265 See *supra*, section 3.1.2, for discussion of these barriers, and *infra*, section 6, for recommendations regarding local and state action vis-à-vis removing them.

Third, the economic and infrastructure analyses in sections 3.2.1 and 3.2.2 should inform discussions regarding the efficacy of and need for a GON. Too often, the debate over GONs does not adequately examine hard data regarding either the health of the broadband market or the stark economic realities facing the public sector. Nor do discussions acknowledge the opportunity costs associated with steering scarce public funding away from more critical investments like shoring up basic public infrastructure.²⁶⁶

Too often, data purporting to substantiate the efficacy of municipal broadband networks are cherry-picked and offered in isolation from other relevant data. For example, two reports issued by the U.S. Government Accountability Office (GAO) in early 2014 appeared to include favorable data regarding the impact of GONs on broadband deployment and competition. Those who advocate in favor of GONs looked to these reports as proof that municipal networks are effective in spurring competition in local markets and as evidence that state laws impacting such deployment should be preempted by the federal government. However, in offering the data and analysis to Congress, the GAO provided a number of important provisos regarding the rigor of its data; accordingly, it warned that the limited scope of its inquiries should not be seen as conclusive of the viability of GONs in any context. Several other weaknesses in the GAO's analyses, including its omission of the high costs associated with building GONs, have been highlighted by others.

Going forward, discussions about GONs should be grounded in as much data as possible and should be properly contextualized. Doing so will yield more informed and impactful policies that steer investments of scarce public resources towards areas of greatest need.

²⁶⁶ For further discussion of the economic and employment benefits associated with investing public resources in modernizing basic public infrastructure, see generally Diana G. Carew & Michael Mandel, *Infrastructure Investment and Economic Growth: Surveying New Post-Crisis Evidence*, Policy Memo, Progressive Policy Institute (March 2014), available at http://www.progressivepolicy.org/wp-content/uploads/2014/03/2014.03-Carew_Mandel_Infrastructure-Investment-and-Economic-Growth_Surveying-New-Post-Crisis-Evidence.pdf.

Part II

Case Studies & Findings

4

Learning from Experience: Case Studies of 10 Major GONs

Dozens of cities and towns of all sizes have deployed, are in the process of deploying, or are considering the deployment of a GON. Recent data indicate 135 municipal fiber-optic broadband networks have already been built across the country.²⁶⁷

- 38 serve only businesses and several are public-private ventures,²⁶⁸
- 89 fiber-based GONs provide residential service.²⁶⁹

In addition, 74 communities throughout the United States have deployed cable-based GONs that provide Internet access and television services to residents.²⁷⁰ Dozens of others have built some infrastructure—wire-line (fiber and cable) or wireless (mostly Wi-Fi)—meant to serve at least some residents and businesses.²⁷¹

These are small numbers in the grand scheme of U.S. local government. Over 19,000 municipal governments exist across the country, along with an additional 16,500 town or township governments.²⁷² Some who advocate in favor of GONs view the slow, but steady, rise in municipal broadband deployments, especially those that are fiber-based, as supporting the arguments about the state of broadband in the United States and the relative ease of building and operating such complex, dynamic networks.²⁷³ In addition, supporters of GONs also cite the rising number of public-private partnerships (PPPs) and other hybrid approaches to bolstering connectivity as further evidence in support of the perceived inadequacies of the market for high-speed Internet access.²⁷⁴

Unlike public-private and other hybrid approaches,²⁷⁵ the planning, funding, construction, maintenance, and operation of a GON is handled completely by the municipality. These municipalities allocate a significant

267 See Masha Zager, *Number of Municipal FTTP Networks Climbs to 135*, at p. 22, *Broadband Communities* (May/June 2013).

268 *Id.* at p. 24.

269 See Community Broadband Networks, Map, <http://www.muninetworks.org/communitymap>.

270 *Id.*

271 *Id.* As noted above in section 2, the number of municipal wireless networks has decreased dramatically in recent years. This is due in large part to the emergence of 3G and 4G wireless broadband adoptions, which are incredibly popular with consumers, as well as a desire by cities to forge PPPs with ISPs to deploy Wi-Fi networks in public spaces (e.g., parks). Additional discussion regarding the latter is provided in section 6, *infra*.

272 See U.S. Census Bureau, Lists & Structures of Government, Population of Interest—Municipalities and Townships, http://www.census.gov/govs/go/municipal_township_govs.html.

273 See, e.g., Susan Crawford and Robyn Mohr, *Bringing Municipal High-Speed Internet Access to Leverett, Massachusetts*, Research Publication No. 26 (Dec. 2013), The Berkman Center for Internet & Society at Harvard University, available at http://cyber.law.harvard.edu/publications/2013/internet_to_leverett (profiling a “successful” GON in the “hope” that it will “be helpful to other cities that are considering launching fiber optic networks.”); Press Release, *Community Broadband Networks Lead the Way on US Ignite Partnership*, June 14, 2012, New America Foundation, available at http://newamerica.net/pressroom/2012/community_broadband_networks_lead_the_way_on_us_ignite_partnership (arguing that community broadband networks are on the cutting-edge of innovation in this space vis-à-vis incumbent ISPs); *The Assault on Municipal Broadband*, Free Press Issue Brief (July 2012), available at http://www.freepress.net/sites/default/files/resources/brief_broadband.pdf (arguing that GONs should be seen as a necessary community investment because broadband is a “modern-day utility”).

274 There is an array of alternative, non-GON approaches to bolstering broadband connectivity on both the supply side and the demand side. Many of these are structured as public-private partnerships, the most successful of which leverage public resources and private expertise to deploy, maintain, and operate high-speed networks. These and other effective non-GONs models for bolstering broadband connectivity are discussed in more detail in section 6.

275 For an overview of how these types of arrangements are typically structured, see, e.g., Charles M. Davidson & Michael J. Santorelli, *Broadband and the Empire State: Achieving Universal Connectivity in New York*, at p. 23-31, ACLP at New York Law School (Sept. 2012), available at http://www.nyls.edu/user_files/1/3/4/30/83/ACLP%20Report%20-%20Broadband%20and%20the%20Empire%20State%20-%20September%202012.pdf (“*Broadband and the Empire State*”). For additional discussion see *infra*, section 6.

Table 4.1: Overview of GONs Case Studies

	Network Overview				Cost to Build				Financials (most recent annual figures)			
	Network Type	Status	Subscribers	Fiber Miles	Bonds	Loans*	Gov't Grants	Cross-Subsidies	Revenues	OpEx	Debt Service	PILOTs**
EPB Chattanooga, TN	FTTH	Built	55,000 ¹	8,000 ²	\$229M ³	\$74.5M ⁴	\$111M ⁵	None	\$80.7M ⁶	\$26.06M ⁷	\$2.05M ⁸	\$1.6M ⁹
BVU Opt-Net Bristol, VA	FTTH	Built	13,400 ¹⁰	1,288 ¹¹	\$72+M ¹²	\$23.7M ¹³	\$90.4M ¹⁴	None ¹⁵	N/A ¹⁶	N/A ¹⁷	N/A ¹⁸	N/A ¹⁹
LUS Fiber Lafayette, LA	FTTH	Built	14,000 ²⁰	800 ²¹	\$132M ²²	\$16.4M ²³	None	None ²⁴	\$24M ²⁵	\$29.3M ²⁶	\$1.5M ²⁷	\$0 ²⁸
FiberNet Monticello, MN	FTTH	Built	1,270 ²⁹	151 ³⁰	\$26.4M ³¹	\$4.1M ³²	None	\$4.45M ³³	\$1.756M ³⁴	\$2.292M ³⁵	\$1.8M ³⁶	\$0 ³⁷
CFU Fiber Cedar Falls, IA	FTTH	Partially Built	17,000 ³⁸	750 ³⁹	\$18.45M ⁴⁰	\$2.0M ⁴¹	\$880k ⁴²	None	\$14.3M ⁴³	\$13.2M ⁴⁴	\$1.7M ⁴⁵	\$0 ⁴⁶
nDanville Danville, VA	FTTH	Partially Built ⁴⁷	200 ⁴⁸	165 ⁴⁹	None	\$2.5M ⁵⁰	\$1M/ year ⁵¹	None	\$1.8M ⁵²	\$1.7M ⁵³	\$0	\$250k ⁵⁴
UTOPIA UT (multiple cities)	FTTH	Partially Built ⁵⁵	8,240 ⁵⁶	1,800 ⁵⁷	\$185M ⁵⁸	\$29.7M ⁵⁹	\$37.2M ⁶⁰	None	\$11.7M ⁶¹	\$12.4M ⁶²	\$12.8M ⁶³	\$0
TVC Groton, CT	Hybrid Fiber/ Coaxial ⁶⁴	Built & Sold	N/A ⁶⁵	N/A ⁶⁶	\$34.5M ⁶⁷	N/A	None	\$2.5M/ year ⁶⁸	N/A	N/A	N/A	N/A
iProvo Provo, UT	FTTH	Built & Sold	N/A ⁶⁹	N/A ⁷⁰	\$39.5M ⁷¹	\$1M ⁷²	None	\$19.3M ⁷³	\$570k ⁷⁴	\$1.89M ⁷⁵	\$3.3M ⁷⁶	N/A
Greenlight Wilson, NC	FTTH	Built	6,000 ⁷⁷	N/A	\$33.7M ⁷⁸	\$4.75M ⁷⁹	None	None	\$11.42M ⁸⁰	\$11.42M ⁸¹	\$3.02M ⁸²	\$0 ⁸³

M=million; k=thousand

*Financial transfers from a municipality or utility are often in the form a loan. While some have challenged these loans as cross-subsidization, courts often find that these transfers are not, in fact, cross-subsidies. Other networks receive loans directly from financial institutions instead of bonding. As such, this column includes loans from municipalities, utilities, and financial institutions.

**PILOTs, or payments in lieu of taxes, are payments made by utilities and GONs to compensate local governments for tax revenue lost as a result of utilities' entity status and government affiliation. A lack of PILOT payments is essentially equivalent to a lack of tax payments by a private sector entity.

Endnotes are included in Appendix I.

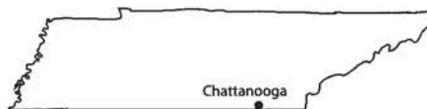
amount of public resources (e.g., taxpayer dollars, debt obligations) in funding these projects, frequently without finding an outlet to hedge against or otherwise spread the many associated risks.²⁷⁶ In addition, the vast majority of GONs have been deployed in areas already served by multiple wireline and wireless broadband ISPs.²⁷⁷ As discussed in more detail below such duplicative deployments tend to either undermine the GON or skew market forces.

To better understand the practical difficulties and financial hazards associated with municipal broadband projects, this section profiles 10 GONs. These include networks in Chattanooga, Tennessee; Bristol, Virginia; Lafayette, Louisiana; Monticello, Minnesota; Cedar Falls, Iowa; Danville, Virginia; UTOPIA, Utah (a consortium of 16 cities); Groton, Connecticut; Provo, Utah; and Wilson, North Carolina. These particular networks represent a broad spectrum of recent U.S. municipal broadband efforts. While they share many traits, including being built in areas already served by broadband ISPs, the story of each individual GON provides a series of lessons and insights that can be used by jurisdictions considering the creation of a GON. Table 4.1 provides an overview of the 10 GONs case studies and presents key information on each case.

4.1 Chattanooga, Tennessee

The city-owned gigabit broadband network in Chattanooga, Tennessee, is often cited as a prime example of how municipal networks can thrive under the right circumstances.²⁷⁸ Since its 2010 launch, the city has rebranded itself as “the gig city”²⁷⁹ and has begun the processes of trying to use its network to grow a high-tech sector from scratch, and streamline a number of core municipal functions.²⁸⁰ Federal policy makers have taken note and have cited Chattanooga as a model that other cities might follow in meeting a “gigabit city challenge,” which calls for “at least one gigabit community in all 50 states by 2015.”²⁸¹ Yet a number of aspects of the Chattanooga GON render it unique and may make it difficult for other municipalities to replicate. The system in Chattanooga also has a very high price tag, which caused the city to assume a heavy debt burden and raises the possibility that, over time, the costs of this network might very well outweigh any consumer benefits.

Chattanooga, Tennessee At-A-Glance



City Population: 171,279 (2012)

Year of Network Launch: 2010

Current Status: Built

Number of subscribers: 55,000

Revenues: \$80.7 million

Operating Expenses: \$26.1 million

Note: Additional information on the Chattanooga network is contained in Table 1 and in Appendix I.

276 Indeed, many of the most popular means of funding these public networks involve either the assumption of significant new debt by a municipality or the reallocation of funds that could be used for other, more impactful purposes (e.g., improving local electric and water systems). See *How Municipal Networks are Financed*, Institute for Local Self-Reliance (Jan. 2014), available at <http://www.ilsr.org/wp-content/uploads/2014/01/financing-munis-fact-sheet.pdf>.

277 Compare Community Broadband Networks, Map, <http://www.muninetworks.org/communitymap>, with National Broadband Map, <http://www.broadbandmap.gov/>.

278 See, e.g., Christopher Mitchell, *Broadband at the Speed of Light: How Three Communities Built Next-Generation Networks*, at p. 31-60, Institute for Local Self-Reliance (April 2012), available at <http://www.ilsr.org/wp-content/uploads/2012/04/muni-bb-speed-light.pdf> (“*Broadband at the Speed of Light*”). See also Edward Wyatt, *Fast Internet is Chattanooga’s New Locomotive*, Feb. 3, 2014, N.Y. Times, available at <http://www.nytimes.com/2014/02/04/technology/fast-internet-service-speeds-business-development-in-chattanooga.html> (“*Chattanooga’s New Locomotive*”).

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

280 See, e.g., Steve Lohr, *Fastest Net Service in U.S. Coming to Chattanooga*, Sept. 12, 2010, N.Y. Times, available at <http://www.nytimes.com/2010/09/13/technology/13broadband.html?pagewanted=all> (reporting on the city’s plans to use its gigabit network for these and other purposes); Laura Baverman, *Chattanooga’s Gig City Makes Play to be ‘Internet of Things’ Capital*, March 15, 2013, *Upstart Business Journal*, available at <http://upstart.bizjournals.com/companies/hatched/2013/03/15/need-bandwidth-come-to-gig-city-and.html?page=all> (reporting on the city’s Gig Tank program to encourage and incubate high-tech startups).

281 See Press Release, *FCC Chairman Genachowski Issues Gigabit City Challenge*, Jan. 18, 2013, FCC, available at <http://www.fcc.gov/document/fcc-chairman-genachowski-issues-gigabit-city-challenge>.

4.1.1 Background

The fiber-optic network that would eventually evolve into Chattanooga's gigabit GON first emerged in April 1996, when the board of the city's electric utility²⁸² —the Electric Power Board (EPB)—passed resolutions authorizing construction of a communications network to connect electrical assets (e.g., substations) and the use of \$350,000 to fund the first phase of build-out.²⁸³

Once deployed, the network was under-utilized for a number of years, leaving the local government and EPB to consider how to put the network to more productive uses.²⁸⁴ At that time, numerous legal restrictions limited the types of services and businesses in which a municipal utility could engage vis-à-vis its communications network. In the early 2000s, the state legislature began to amend its laws to allow municipal utilities like EPB to offer non-electric services (including “cable service, two-way video transmission, video programming, [and] Internet services”)²⁸⁵ and make loans between their divisions.²⁸⁶ These amendments spurred plans to commercialize EPB's emerging broadband network. In 2007, the EPB board approved a plan to offer fiber-to-the-home (FTTH) service; in November 2008, the city of Chattanooga granted EPB a franchise for these purposes.²⁸⁷

EPB's expansion into the market for telecommunications and broadband services was met with lawsuits from incumbent ISPs and an array of other organizations. The Tennessee Cable Telecommunications Association, for example, filed suit against EPB claiming that its business plan violated Tennessee state law.²⁸⁸ In particular, the group argued that EPB was illegally cross-subsidizing its communications services with revenue from its electric service.²⁸⁹ The case was eventually dismissed, and EPB was free to continue with its expansion plans.²⁹⁰

4.1.2 Cost and Financing

The EPB fiber network, which supports its gigabit broadband service and a smart grid system,²⁹¹ was financed with a number of intra-utility loans, one-off federal grants, and significant debt. All told, the smart grid and broadband networks have cost approximately \$390 million to deploy.²⁹²

At the outset, EPB Fiber, the division of the utility responsible for building the GON, received a \$50 million loan from EPB Electric during the planning phase of the FTTH network.²⁹³ In 2009, EPB was awarded \$111.5 million in federal stimulus funding from the U.S. Department of Energy in support of its smart grid system.²⁹⁴ To raise additional funds needed to build the fiber-optic network, EPB issued \$229 million of local revenue

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

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

284 *Id.*

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

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

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

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

289 *Id.*

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

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

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

293 *Id.*

294 *Id.* See also Press Release, *EPB Chattanooga Awarded Federal Stimulus Grant for Smart Grid*, Oct. 28, 2009, EPB, available at <https://www.epb.net/news/news-archive/epb-chattanooga-awarded-federal-stimulus-grant-for-smart-grid/>.

bonds, which carried an interest rate of 4.5 percent and were rated as AA+ by Fitch.²⁹⁵ About 70 percent of this bond issue—\$162 million in all—was used to fund the fiber-optic build-out.²⁹⁶

The local revenue bonds have a 25-year maturity and are due to be paid in full in 2033.²⁹⁷ The EPB communications division maintains a \$5 million line of credit secured by revenues and assets, which is used for working capital needs (by mid-2012, about half of this balance was outstanding).²⁹⁸ In March 2011, EPB obtained a bank loan for \$19.5 million over the course of 60 months, guaranteed by the revenues and finances of its communications division.²⁹⁹ The purpose of this loan was to pay off the loan provided by EPB's electric division.³⁰⁰ In August of 2012, EPB obtained a \$60 million revolving line of credit to pay the remaining loan balance.³⁰¹ The line of credit is secured by the assets and revenues from the video and Internet system.³⁰²

In the recent past, EPB has made a number of financial decisions aimed at securing lower interest rates and more favorable financing terms.³⁰³ Many of these actions were enabled by the network's close relationship with the larger EPB utility and the city of Chattanooga (and, by extension, its residents), all of whom serve as financial backstops for the system. In 2012, there was a downgrade of the utility's bond rating.³⁰⁴ The downgrade was due to an "increase in leverage to fund capex in the electric system's smart grid."³⁰⁵ Fitch, the ratings agency, also expressed concern with the use of cross-subsidies (i.e., money from the Fiber division supporting the Electric division) and cost savings (from the smart grid) instead of rate increases to support future EPB investments.³⁰⁶ In particular, Fitch noted that it was wary of the "variable nature" of these revenue sources.³⁰⁷

4.1.3 The Network

The EPB FTTH network is fully operational and provides broadband for schools, residences, and local businesses.³⁰⁸ The service is available to 170,000 homes, schools, and businesses in the service area, covering 600 square miles and a population of several hundred thousand people.³⁰⁹ As of September 2013, EPB Fiber had "over 55,000 residential and business customers."³¹⁰ Its residential services bring in roughly 65 percent of overall revenue.³¹¹ With regard to its signature gigabit service, by the end of 2013, "only about 3,640 residents, or 7.5 percent of its Internet-service subscribers, [had] signed up" for it.³¹² In addition, "roughly 55 businesses" also subscribe to the gigabit service.³¹³

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

296 *Id.*

297 *Id.*

298 See *Senior Management Report & Financial Information 2012*, at p. 43, EPB (Sept. 2012), available at <https://www.epb.net/flash/annual-reports/2012/assets/uploads/EPB-Financials.pdf> ("*Senior Management Report & Financial Information 2012*").

299 *Id.* at p. 44.

300 *Id.*

301 See *Senior Management Report & Financial Information 2013*, at p. 53, EPB (Sept. 2013), available at https://www.epb.net/flash/annual-reports/2013/downloads/EPB_Financials_2013.pdf ("*Senior Management Report & Financial Information 2013*").

302 *Id.*

303 *Id.* at p. 43.

304 See, e.g., Bhala Mehendale, *Fitch Downgrades Chattanooga Electric Power Board, TN Electric System Revs to 'AA'*, March 7, 2012, Fitch Ratings, available at <http://mobile.reuters.com/article/companyNewsAndPR/idUS241871+07-Mar-2012+BW20120307> ("*Fitch Downgrades Chattanooga Electric Power Board*").

305 *Id.*

306 *Id.*

307 *Id.*

308 The construction timeline was projected to extend over 30 months. See Karl Pfeil & Jason Clark, *Fitch Rates Chattanooga Electric Power Board's \$215MM 2008 Utility Revs 'AA'*, Feb. 13, 2008, Fitch Ratings, available at http://www.fitchratings.com/creditdesk/press_releases/detail.cfm?pr_id=405532.

309 See *Popular Annual Financial Report for the Year Ended June 30, 2012*, at p. 8, City of Chattanooga Finance & Administration Department, available at http://www.chattanooga.gov/images/finance_files/FY12_PAFR_updated.pdf.

310 See *EPB Increasing Fiber Optic Speeds; Lowering Customer Prices*, Sept. 17, 2013, The Chattanooga.com, available at <http://www.chattanoogan.com/2013/9/17/259342/EPB-Increasing-Fiber-Optic-Speeds.aspx>.

311 *Senior Management Report & Financial Information 2012* at p. 17.

312 *Chattanooga's New Locomotive*.

313 *Id.*