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| Broadband in Connecticut: Initiatives and Updates |
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Contents

[Why is Broadband important? 3](#_Toc400093727)

[Health care 3](#_Toc400093728)

[Public Safety 3](#_Toc400093729)

[Energy 3](#_Toc400093730)

[Government Performance 4](#_Toc400093731)

[Education 4](#_Toc400093732)

[Economic Development 4](#_Toc400093733)

[Workforce Development 4](#_Toc400093734)

[Transportation 4](#_Toc400093735)

[Definitions 5](#_Toc400093736)

[Broadband 5](#_Toc400093737)

[Speed 5](#_Toc400093738)

[Reliability/ Redundancy 5](#_Toc400093739)

[Bandwidth (Capacity) 6](#_Toc400093740)

[Cloud Computing 6](#_Toc400093741)

[Latency (Speed) 6](#_Toc400093742)

[Spectrum 6](#_Toc400093743)

[What’s New since the 2010 CT State Broadband Guidelines 7](#_Toc400093744)

[Introduction and Background 7](#_Toc400093745)

[State Organization 7](#_Toc400093746)

[Establishing Goals and Progress Metrics 9](#_Toc400093747)

[Adoption of Broadband 11](#_Toc400093748)

[Pole Attachment and Cell Tower Siting Processes 13](#_Toc400093749)

[Infrastructure and Access 14](#_Toc400093750)

[Other Initiatives in CT 17](#_Toc400093751)

[Open Data Policy and the Connecticut Data Portal 17](#_Toc400093752)

[The Connecticut Data Collaborative 17](#_Toc400093753)

[Why Would CT Want Gig Service? 18](#_Toc400093754)

[Case Studies 18](#_Toc400093755)

[Google Checklist for Considering Gig Service 25](#_Toc400093756)

[Resources 27](#_Toc400093757)

[Nutmeg Network 27](#_Toc400093758)

[CT Government Management Information Systems (GMIS) 27](#_Toc400093759)

[FirstNet 28](#_Toc400093760)

[Gig.U 28](#_Toc400093761)

[National Broadband Map 28](#_Toc400093762)

[Office of Consumer Counsel 29](#_Toc400093763)

[How to get for more information 29](#_Toc400093764)

[Appendix A: Broadband in CT (Usage statistics) 30](#_Toc400093765)

[Table 1: Percent of Households with Broadband, Connecticut Compared to other US States 30](#_Toc400093766)

[Table 2: Percent of Households with Broadband, Connecticut Compared to OECD Countries 30](#_Toc400093767)

[Table 3: Average Peak Connection Speed, Top 10 States–Third Quarter 2013 30](#_Toc400093768)

[Table 4: Average Peak Connecticut Speed, Top 10 Countries/CT–Third Quarter 2013 31](#_Toc400093769)

## Why is Broadband Important?

Broadband technology has revolutionized the way services are provided and business is conducted. By improving communication and the flow of information, broadband enhances efficiency, thus, enabling significant advances in Connecticut’s ability to compete in the global economy. This facilitates job creation, decreases health-care costs, reduces miles driven and fossil fuels consumed, expands consumer choice, and improves competition. As a result, Connecticut’s citizens are beneficiaries of advancements in health care, public safety, energy, government, performance, education, economic development, workforce development, and transportation.

Fortune 500 companies and government services now require digital literacy for their job applications and Medicare claims, respectively. Possessing digital literacy skills is an essential competency necessary for professional advancement and personal prosperity. Those who do not have access to the Internet are at a disadvantage in the academic arena and the increasingly competitive labor market. Once one has access to broadband, one perceives it as more of a necessity than luxury. In an online poll measuring the importance to consumers who currently have broadband connections, 85 percent of those polled said they would give up eating out, designer coffee and cable TV before their cell phone and Internet service—demonstrating the importance for one to have broadband Internet access.[[1]](#footnote-1)

The following are descriptions of how access to broadband impacts economic development and industry.

### **Health care**

Access to broadband increases the ability to use electronic medical records, wireless medical devices, and capacity to collect and analyze patient information. Broadband can provide real-time data to providers, allowing for faster diagnosing and treatment, thus improving patient care. Electronic medical records can reduce redundant treatment, eliminate time-intensive paperwork, and expand research and data capabilities. In addition, UConn Health Center can become a top tier academic medical center from state-of-the-art broadband technologies that Governor Dannel Malloy is proposing.

### **Public Safety**

Broadband can enable a system where first responders nationwide can communicate with each other via public safety wireless communication devices. For example, a firefighter arriving at a scene could instantly check police communications and data transmissions such as building maps with a PDA or laptop—possibilities not currently available with just radios. In addition, the state has signed a $14.2 million contract that will allow nearly a dozen criminal justice agencies in Connecticut to share information.[[2]](#footnote-2) Broadband could enable the real-time tracking of offenders and maintain accurate and reliable information that further promotes public safety.

### **Energy**

Smart Grid technology, enabled by broadband, provides consumers with real-time energy consumption data, increasing the likelihood of energy conservation. Smart Grid implementation can revolutionize the way people live and function with the appliances and technologies in their homes. For example, mobile devices could enable individuals to control their heat and lights remotely. Also, Smart Grid technologies provide opportunities for improved management of the electricity transmission and distribution system.

### **Government Performance**

Broadband facilitates the delivery of e-government services and applications, providing government with more opportunities to communicate with its constituents. The ability for government to offer more services online increases the efficiency and accessibility for all residents with access to the Internet. With the state facing structural budget deficits, offering more services online is one way for government to reduce the cost of providing services to the public.

### **Education**

As the content grows on the Internet, more teachers are assigning homework that requires access to the Internet—and using the Internet to enhance and add dimensions to traditional learning techniques at all levels of instruction. For example, students can now participate in virtual high school classes. This allows students to take classes not offered at their high school and to learn at their own speed. The Internet also enables parents to more easily communicate with teachers and to view grades, progress reports, and other student evaluation information.

### **Economic Development**

Broadband enables towns, regions, and states to develop, attract, retain, and expand job-creating businesses and institutions. It enables new business growth and the expansion of existing businesses into new markets.

### **Workforce Development**

Broadband-enabled job-training can customize training so it reaches the broadest group of people at a lower cost and with greater flexibility than the traditional model of training classes. Broadband enables a workforce system to provide individuals with training and career help in a more flexible and cost-effective manner.

### **Transportation**

Broadband enables technologies that can alleviate congestion, enhance road safety, and reduce the environmental impact of transportation. For example, in South Korea, wireless sensors help monitor the health of bridges.[[3]](#footnote-3) This changes the model from an engineer inspecting a bridge on-site and then reporting back, to using data collected remotely to monitor the condition of a bridge continuously. Another example of the possibilities with broadband is in San Francisco, where a mobile network is used to deploy a smart parking system that allows users to locate open parking spots or pay for parking using a mobile phone.[[4]](#footnote-4) Broadband also enables telecommuting, reducing traffic congestion during peak hours and reducing pollution.

## Definitions

### Broadband

Broadband, the latest successor to dial-up, is the most used and fastest form of Internet access. Broadband service provides higher speeds of data transmission allowing more content to be carried through the transmission “pipeline.” Many of the current and newly-developing services including streaming media, VoIP, gaming, and interactive services, require the transfer of large amounts of data that may not be technically feasible with dial-up service. Thus, broadband service has become increasingly necessary to access the full range of services and opportunities that the Internet can offer.

Broadband provides Internet access through a fixed or mobile wireless connection. Fixed technology connections include DSL, cable modem, and T-1 or fiber optic, whereas mobile wireless connections mean the device can access the Internet without a wire connection. Deployment of broadband infrastructure throughout an area depends on a provider’s ability to access local rights-of-way, telephone and electric poles, and wireless-tower sites. Therefore, different methods of broadband Internet access are used according to the technical characteristics of a location.

### Speed

Broadband’s fixed and mobile wireless technologies have a higher Mbps than dial-up Internet access. FTTP and cable modems have the fastest national average download speeds with a 7.7 Mbps and 5.5 Mbps, respectively. Wireless connectivity has the slowest national average download speed, but it can extend to less densely populated communities and into older buildings where wired solutions may be more expensive to deploy.

Depending on the type of online activity one requires, basic or premium connectivity may be a necessity. Wireless connectivity is sufficient for emailing, web browsing and instant messaging because each requires basic connectivity. Conversely, large data downloads; video teleconferencing, Internet Protocol TV, and streamed classroom lectures are examples of content that requires premium connectivity. Broadband’s fixed Internet technologies will provide the required connectivity for premium connectivity content.

### Reliability/ Redundancy

Redundancy ensures reliability, which is essential to public safety, national security, and every business reliant on connectivity. If an Internet connection is lost, redundancy must be present, or Internet access will not be available. An organization’s downtime may be caused by an external network outage. Wireless broadband, however, may reduce an organization’s downtime because it is one of the most reliable redundancy technologies available. Businesses with mission critical operations seeking full redundancy must combine their wired connection with a fixed wireless connection to create a truly redundant network with network and path diversity. Additionally, wireless Internet connection will enhance public safety and national security because in the case of a national disaster or an act of terror, one may have an additional source of Internet access. Therefore, with wireless connection redundancy, if one provider loses connection, there is still another connection available, thereby adding maximum reliability.[[5]](#footnote-5)

### Bandwidth (Capacity)

Bandwidth is the transmission capacity of an electronic pathway. In a digital line, it is measured in bits per second or bytes per second. In an analog or digital channel that is wrapped in a carrier frequency, bandwidth is the difference between the highest and lowest frequencies and is measured in Hertz. In more general terms, it refers to the volume of data per unit in time an Internet connection can handle.

### Cloud Computing

Cloud computing is an emerging architecture that links computers in a grid and allows users to access data or processing powering. Storing photos on the web or accessing webmail are two examples of cloud computing (from Pew Internet).

### Latency (Speed)

Latency measures the amount of time (usually measured in milliseconds) it takes for data packets to travel from one computer to another application or computer across a network. Latency can help describe a measure of “distance” between hosts on a network. For example, a reasonable roundtrip latency measurement between a pair of hosts from east cost to west coast may be roughly 90 milliseconds, whereas the latency between Atlanta and Philadelphia is closer to 20 milliseconds. High latency can be a problem with applications that require real-time back-and-forth communication, such as online phone calls and video conferencing.

### Spectrum

Spectrum is the range of electromagnetic radio frequencies used to transmit sound, data, and video across the country. It is what carries voice between cell phones, television shows from broadcasters to your TV, and online information from one computer to the next, wirelessly. Because there is a finite amount of spectrum and a growing demand for it, effectively managing the available spectrum is an important priority for the FCC (from FCC web site).

## What’s New since the 2010 CT State Broadband Guidelines

### Introduction and Background

In 2010, Connecticut was awarded a competitive, merit-based matching grant from the US National Telecommunications and Information Administration (NTIA) to develop a strategic plan for broadband coordination and implementation. The State contracted with the Connecticut Academy of Science and Engineering (CASE) for the purposes of collecting and analyzing input from key stakeholders needed for the development of the strategic plan.

In December 2011, CASE published the *Guidelines for* *Development of a Strategic Plan for Accessibility to Broadband Services in Connecticut* for the Connecticut Office of Consumer Counsel (OCC), the Connecticut Public Utilities Regulatory Authority (PURA), and the Department of Energy and Environmental Protection (DEEP).

Five recommendations were identified as key areas needed to develop a strategic broadband plan and to ensure that Connecticut remains competitive in providing its residents and businesses with high speed, affordable broadband technologies.

The five recommendations areas from the report are:

* State organization,
* Establishing goals and progress metrics,
* Adoption of broadband,
* Pole attachment and cell tower siting processes, and
* Infrastructure and access.

Since the release of the CASE report, actions by the State and related entities have been taken to address the recommendations from the CASE report so that broadband technologies are accessible and can be leveraged as a Connecticut asset.

### State Organization

#### Background

The first recommendation from the report focused on state organization. CASE identified a lack of coordination and communication among state entities responsible for broadband policy as an impediment to the development of an effective broadband plan and policy. In an effort improve broadband coordination and communication, the report called for the creation of:

“A formal communication structure for developing and sustaining broadband policy, strategy, and promotion, in the form of a broadband cabinet, be created to enhance economic development and leadership opportunities in Connecticut.”[[6]](#footnote-6)

To achieve this end, it was recommended that the broadband cabinet be comprised of representatives from existing state agencies THAT can impact broadband policy. It was also recommended that the State appoint a broadband coordinator to develop and advance the goals of the strategic broadband plan.

#### Updates

Since the publication of the CASE report, a formal cabinet focused on coordinating the development of a broadband policy has not been created. However, the Connecticut Commission on Education Technology (CET)[[7]](#footnote-7) is an organized legislatively mandated body involved in coordinating the development of broadband policies in an effort to advance the expansion of broadband across the state.[[8]](#footnote-8) The CET is comprised of many state leaders who can impact broadband policy including:

* The Chief Information Officer for the State
* The Commissioner of the Department of Economic and Community Development
* A representative from the University of Connecticut (UCONN)
* A representative from the State Library System
* The Information Technology Director for the Office of Policy and Management
* The State Broadband Policy Coordinator from the Office of the Consumer Counsel
* A representative from the Connecticut State Department of Education
* A representative from the Connecticut Board of Regents
* A representative from the Connecticut Conference of Independent Colleges
* A representative from the Connecticut Association of Board of Education
* A representative from the Connecticut Conference of Municipalities
* A representative from the Connecticut Council of Small Towns
* A representative from the Connecticut Library Association
* A representative from the Governor’s Office
* The Speaker of the House
* Minority Leader of the House
* A representative from the Department of Administrative Services.

The CET governs the Nutmeg Network, which is responsible for expanding availability and access of high speed networks in the State, including broadband networks. The Nutmeg Network is comprised of two sub-entities: the Connecticut Education Network (CEN) and the Public Safety Data Network (PSDN).[[9]](#footnote-9) The CEN, which is dedicated to delivering reliable, high-speed internet access for its members, is highly involved in coordinating and shaping broadband strategies. Currently, CEN members include educational institutions, libraries, and government entities across Connecticut.

Since 2011, the CET and the CEN have implemented strategies focused on enhancing state organization around broadband policy and have been legislatively mandated to expand broadband access to different entities throughout the state.

Organizing activities include:

* The CET was mandated by the legislature to create a five year plan for the CEN with the goal of providing state-of-the-art, high-speed, reliable Internet access and video, voice and data transmissions that electronically link all educational institutions in the state, including public and independent institutions of higher education, the state’s libraries and all elementary, middle and secondary schools and other institutions including businesses, job centers and community organizations.[[10]](#footnote-10)
* The Nutmeg Network has been legislatively mandated to forge a closer cooperation and seamless functioning among the three sub-networks.[[11]](#footnote-11)
* The Nutmeg Network has also been legislatively mandated to expand the CEN network to municipalities and regional council of governments (COGs), thereby expanding its mission of providing high speed networks to non-educational institution users. This mandate allows for the fostering of new relationships and will create synergies with municipal and COG users.
* The CEN is in the midst of developing a formal strategic plan. Goals outlined in the plan that focus on state organization include[[12]](#footnote-12):
  + The creation of a governance structure among different CEN network entities to address legislation (PA 13-247).
  + The creation of synergies among Nutmeg Network entities (The CEN also has the intent to dovetail with other Nutmeg Network sub entities to create a comprehensive Nutmeg Network strategic plan in the future);
  + Collaboration with the Connecticut Government Management Information Sciences (GMIS) to implement the 2 year connectivity plan for Connecticut municipalities.
* The CEN organized two successful CEN annual conferences with the purposes of bringing members together to discuss and learn about technological advances in their field.
* GMIS and CEN are establishing collaborative relationships with municipalities to help towns save money by sharing services[[13]](#footnote-13), which will start in 2015.
* The CET has been legislatively mandated to monitor federal funding opportunities to advance the State’s broadband network. The commission will oversee the state-wide application to the federal Universal Service Fund to enhance the connectivity of the CEN. [[14]](#footnote-14)

### Establishing Goals and Progress Metrics

#### Background

The second recommendation from the CASE report called for the establishment of goals and progress metrics. The recommendation stemmed from recognition that no state broadband goals and metrics to track progress towards goals existed.

The envisioned goal, as detailed in the CASE report, would ideally include provisions to ensure that all Connecticut residents and businesses had access to high speed, affordable broadband connections. Additionally in formulating a goal, it was recommended that cabinet members consider creating a minimum standard for accessing broadband for all Connecticut residents, and publish updated progress metrics on an official broadband website.

#### Updates

A broadband goal for all Connecticut residents has not been formulated and adopted, however the CEN strategic plan includes a broadband goal that has the potential to reach a substantial portion of Connecticut’s population. There are also provisions in the CEN strategic plan to expand access beyond the educational and government sphere, to economically marginalized residents who may have difficulty in accessing broadband services.

The CEN mission/ goal is as follows:

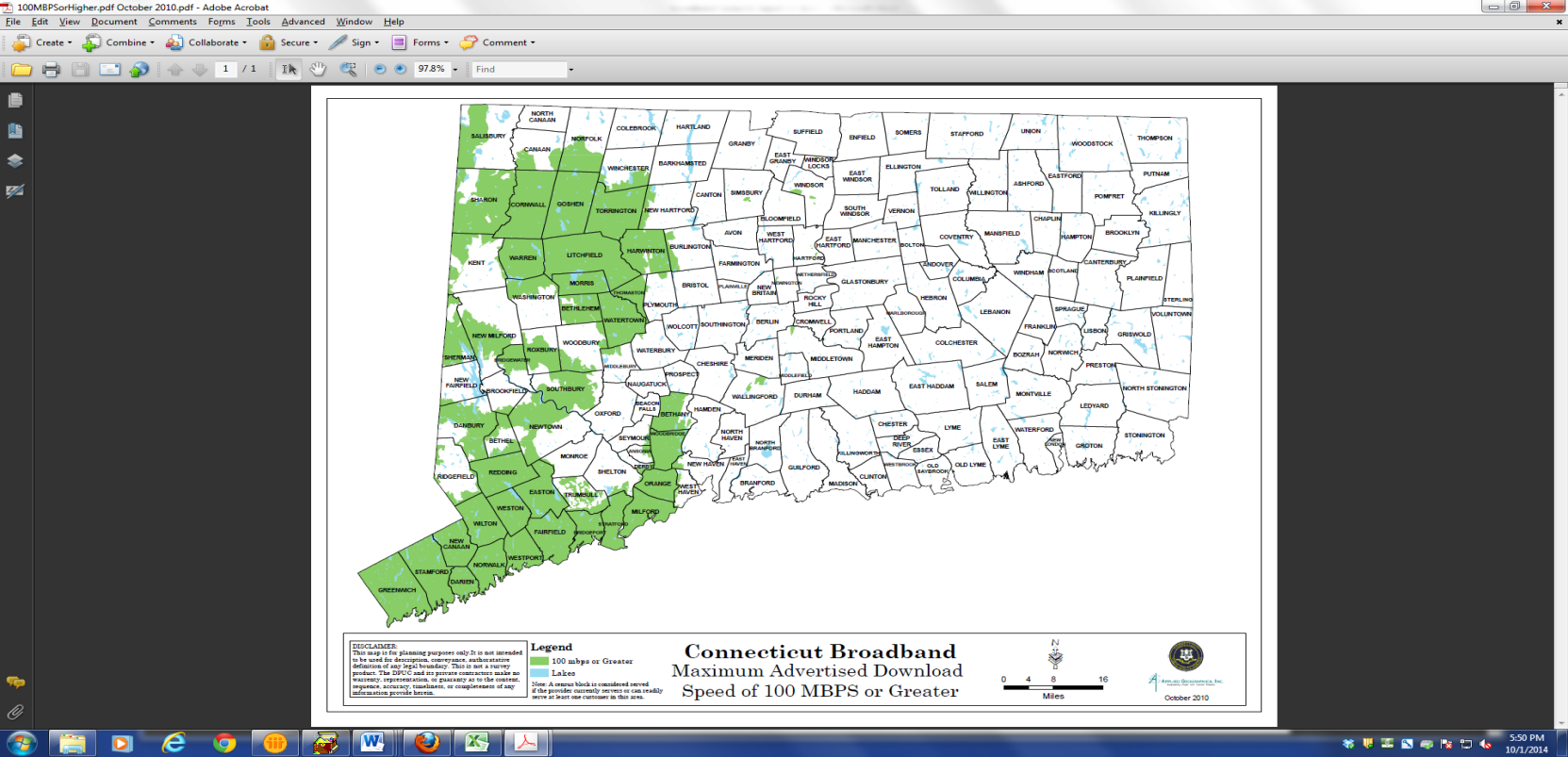
“There will be a robust, state-of-the-art broadband network providing cost-effective network and open-access services among. Connecticut’s educational, library, government, civic, and economic development organizations to facilitate the delivery of essential educational and community services for today and for greater opportunities tomorrow. CEN operates as a connected community to provide fundamental access for people such as students, researchers, faculty and citizens.”[[15]](#footnote-15)

The CET has not defined a minimum standard yet for Connecticut residents and businesses.

Metrics that detail the progression of broadband expansion in the State are available in the form of GIS maps.[[16]](#footnote-16) The maps are continuously updated by using data sent from telecommunications providers present in the State. As of December 2014, however, updates to the maps will cease because funding from the Broadband Technologies Opportunities Program (BTOP) grant, which funds the mapping project, will end.

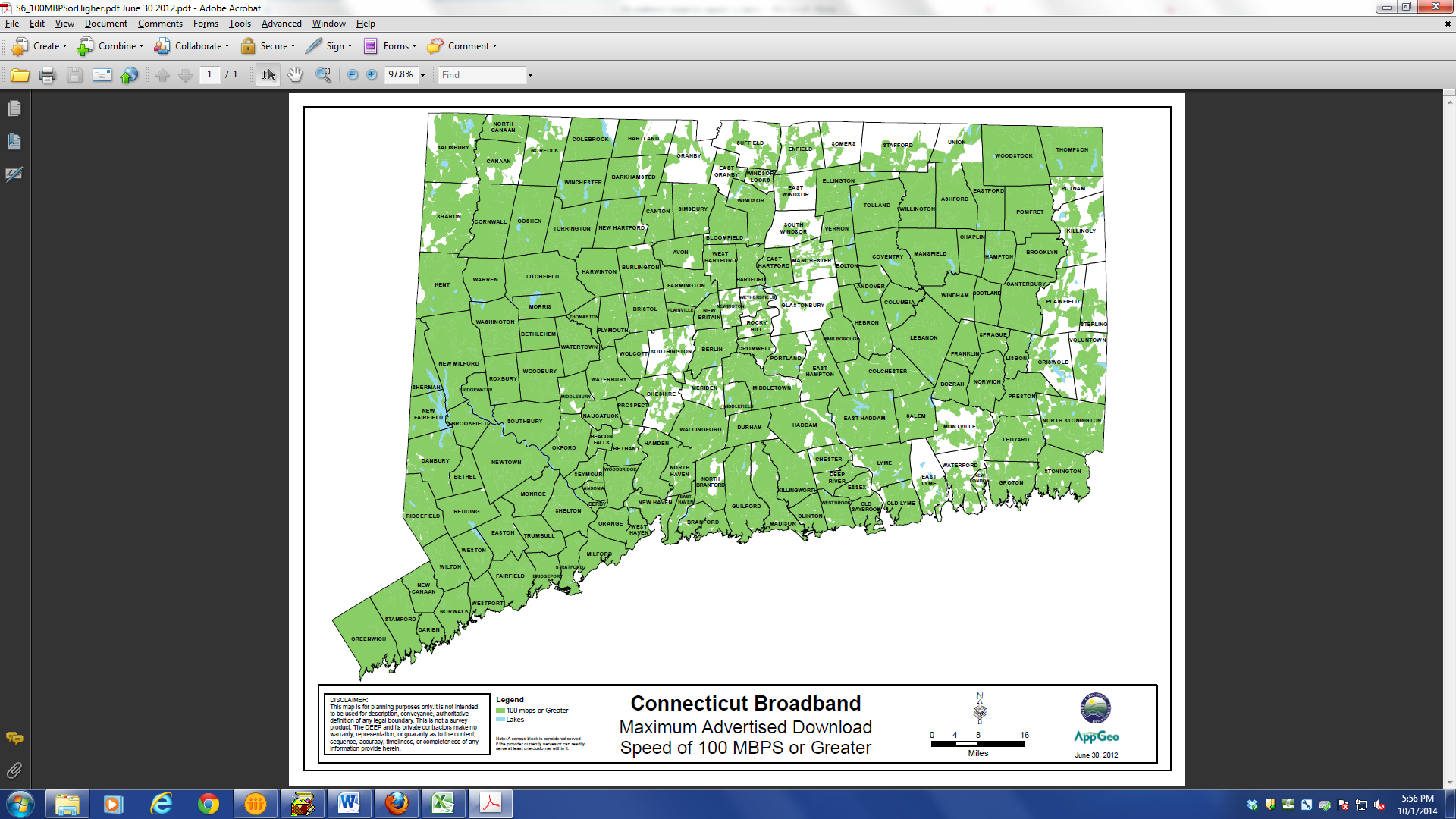
To illustrate the power of the maps, the following shows changes in 100 Mbps or greater broadband coverage in Connecticut from October 2010 to June 2012.

#### Figure 1: Connecticut Broadband Maximum Advertised Download Speed of 100 MBPS or Greater, October 2010



Source: Connecticut State Broadband Initiative

#### Figure 2: Connecticut Broadband Maximum Advertised Download Speed of 100 MBPS or Greater, June 2012



Source: Connecticut State Broadband Initiative

### Adoption of Broadband

#### Background

The CASE report identified that while a substantial number of Connecticut residents have access to broadband, they do not necessarily adopt broadband for reasons such as high broadband installation costs from private vendors. Based on this finding, it was recommended that Connecticut create strategies to increase adoption rates among all potential users and especially for users who cannot easily afford market rate broadband services. The CASE report identified many sub-recommendations to help bridge this gap. The strategies outlined are as follows:

* Find ways to address both the cost of broadband service and to increase digital literacy in populations not currently using broadband service in order to increase adoption rates.
* Consider establishing a statewide pilot program designed to assist low-income residents with the cost of broadband service, such as the issuance of data vouchers.
* Consider mobilizing state agencies to embrace broadband use throughout their business activities.
* Increase awareness of the CEN to teachers and students not yet taking advantage of the current system.
* Facilitate the development of public-private partnerships between nonprofits that are educating residents in the use of broadband and gifting computers.

#### Updates

The expansion of the CEN under the Broadband Technologies Opportunities Program (BTOP) federal grant was designed to be as inclusive as possible so that entities that have difficulty in affording access to a traditional broadband service, can access the CEN at reasonable rates. The CEN has “Open Access” use of the network, which means that any entity has the right to join the network at a fair price without discrimination.[[17]](#footnote-17) The following further elaborates on the intent of the “Open Access” program:

“This network also provides greater access for areas of the state from where it has been prohibitively expensive to obtain high‐speed internet access. Open Access is intended to remove barriers to technology. This could include town‐to‐town sharing of databases, providing remote access to municipal applications, and so on.”[[18]](#footnote-18)

Additionally in 2012, the CET was legislatively mandated to create a five year plan for the CEN. As part of the plan, the CET was tasked with managing the deployment of the Connecticut Digital Library as a component of the CEN. The Connecticut Digital Library is a resource that has the capability to empower and educate all Connecticut’s resident, and will assist in eliminating the “digital divide”; and will help to increase digital literacy.

The following is an excerpt from the legislation:

“The plan shall include the establishment of a Connecticut Digital Library as a component of the Connecticut Education Network to ensure on-line access by all students and citizens to essential library and information resources. The State Library, in conjunction with the Board of Regents for Higher Education, shall administer the Connecticut Digital Library. The Connecticut Digital Library shall provide access to available on-line electronic full-text databases, a state-wide electronic catalog and interlibrary loan system and the electronic and physical delivery of library resources. The Connecticut Digital Library shall include elements specifically designed to meet the educational and research needs of the general public, higher education students and faculty and elementary and secondary school students and teachers. “[[19]](#footnote-19)

### Pole Attachment and Cell Tower Siting Processes

#### Background

The CASE report also addressed issues related to pole accessibility. Telecommunication providers often faced difficulties when trying to access poles to update infrastructural related devices to improve and expand networks. As a result, another recommendation focused on creating a streamlined process for pole accessibility.

In 2008, the Department of Public Utilities Control (DPUC) passed the DPUC Review of the State’s Public Utility Service Pole Make-Ready Procedures – Phase I, which established 90-day time interval for utility pole attachments addressing the make ready work time interval. Further the docket final decision established a maximum 45-day interval for the make-ready estimate process and 45 days to complete the work.

Despite the docket decision, telecommunications providers still experienced delays in updating their pole related infrastructure. PURA recognized weaknesses in the process and decided to pursue strategies to mitigate the problem.

#### Updates

In 2012, PURA convened a working group tasked with studying the feasibility of establishing a single pole administrator and developing ideas for coordination between pole owners and pole users. The working group released its recommendations on September 12, 2014 in the form of a draft report:

* PURA recommends the working group’s decision for Connecticut Light & Power (CLP) and United Illuminating (UI) to be the single pole administrators for their respective service areas.
* The working group recommends that the NOTIFY[[20]](#footnote-20) data system be utilized for pole licensing and administration, and is the system is accessible to all pole owners and users.[[21]](#footnote-21)

Further, the working group identified the following recommendations to increase process efficiencies:

* When the Single Pole Administrator (SPA) becomes aware that a Make-Ready Decision time frame will not be met, it shall notify involved attachers and the Mediation Team to determine the necessary action(s) needed to install the attachment and minimize the delay.
* Only one pole license will be issued upon completion of all make-ready work.
* The SPAs shall record the additional costs incurred when performing their duties so they can be recovered from the appropriate customers. The recovery of additional unreimbursed costs may be proposed in an SPA’s future rate case.
* The SPAs should jointly develop a proposed work plan that identifies their work to coordinate pole replacements during emergency conditions, reduce the number of double poles and conduct shifting projects unrelated to new attachment applications.[[22]](#footnote-22)

In addition to the expected pole administrator changes, in 2013 the General Assembly passed an amendment to the Statute that addressed “municipal gains.” The Statute now states that:

“Use if gain by town, city, borough, fire district or Department of Transportation. Each town, city, borough, fire district or the Department of Transportation shall have the right to occupy and use for any purpose, without payment therefore, one gain upon each public utility pole or in each underground communications duct system installed by a public service company within the limits of any such town, city, borough or district. The location or relocation of any such gain shall be prescribed by the Public Utilities Regulatory Authority. Any such gain shall be reserved for use by the town, city, borough, fire district or the Department of Transportation.”[[23]](#footnote-23)

This Statute in effect now gives municipalities the right to use a part of a pole, or “gain,” located in their jurisdiction for any purpose. The Statute change as well as the working group recommendation for a single pole administrator system will strengthen Connecticut’s ability to expand broadband to all residents and business, and will help position Connecticut as a leader in broadband adoption and accessibility.

### Infrastructure and Access

#### Background

According to the 2011 CASE report, most Connecticut residents have access to some type of broadband network in Connecticut, either through a traditional cable, hybrid fiber-coaxial (HFC), or digital describer line (DSL); or more advanced mechanisms such as fiber-to-the-home or node access. However, the CASE report also pointed out that many geographic pockets of Connecticut still lack access to a broadband network.

In 2009, Connecticut was awarded a $94 million American Recovery and Reinvestment Act (ARRA)/Broadband Technologies Opportunities Program (BTOP) grant from the federal government to install additional fiber across Connecticut for the CEN and for the Public Safety Network. The final recommendation from the CASE report focused on exploring the feasibility of expanding the CEN network to municipal buildings, as well as public safety facilities with the grant monies.

#### Updates

The State has taken solid steps to expand access to broadband across the state. In the 2013 legislative session, statutory changes were made that mandated the extension of the Nutmeg Network to municipal buildings and to the regional COG offices. Furthermore, monies were earmarked for grants to financially assist the municipalities. Public Act 13-247 states:

“The Bureau of Enterprise Systems and Technology shall, in consultation with regional councils of governments, recommend a two-year schedule by which to connect each municipality and regional council of governments to the state-wide high speed, flexible network developed pursuant to section 4d-80 of the general statutes, as amended by this act. On or before October 1, 2013, said bureau shall submit the recommended two-year schedule, in accordance with section 11-4a of the general statutes, to the joint standing committee of the General Assembly having cognizance of matters relating to municipalities.”[[24]](#footnote-24)

Further in regards to the grant monies allocated:

(NEW) (Effective from passage) (a) There is established an account to be known as the "municipal reimbursement and revenue account" which shall be a separate, non-lapsing account within the General Fund. The account shall contain any moneys required by law to be deposited in the account.

(b) Moneys in the account shall be expended by the Office of Policy and Management as follows: (1) For the Nutmeg Network, one million eighty-seven thousand dollars in each of fiscal years ending June 30, 2014, and June 30, 2015.[[25]](#footnote-25)

Municipalities and the COGs had to apply for the grant money by the end of 2013. In May 2014, Governor Malloy approved a series of grants for 54 municipalities and four regional COGs. In addition to the 58 grants approved, 45 other municipalities have completed all the requirements and are awaiting funding, and 13 municipalities are already connected to the network.[[26]](#footnote-26) The Nutmeg Network administrators hope that by next year all remaining municipalities and COGs will be connected to the network.

In addition the extension of the Nutmeg Network to the municipalities and COGs, the Nutmeg Network has made significant headway in connecting more educational institutions and public safety facilities to its network. The CEN met the requirements and the deadlines stipulated under the BTOP grant, and completed the entire project eight months early in April 2013.[[27]](#footnote-27) The following are some highlights from the project.

* $35 million of the BTOP grant was used to upgrade hardware at public schools, libraries, and at CEN facilities.
* 8,880 new fiber miles were added to the State, for upgrading or providing brand new High Speed service to over 940 sites.
* The BTOP Expansion to Public Safety was completed August 2013.

As of 2013, The Nutmeg Network connects approximately 968 Community Anchor Institutions (CAI), including approximately 510 public safety entities, 26 tower sites, 231 K-12 schools, 146 libraries, 44 higher education institutions and 6 public television stations (CPTV) to the network which includes connections to many areas of the state that are currently underserved.[[28]](#footnote-28)

In addition to the CEN and the public safety projects, steps have been taken in terms of transforming the cities of New Haven, Stamford, and West Hartford into “Gigabit Cities.” On September 15, 2014, the Cities issued an RFQ calling for companies to submit applications and ideas for creating “Gigabit Networks” in the three cities.[[29]](#footnote-29) The RFQ outlines three main goals of the project:

* Create a world leading gigabit capable network in targeted commercial corridors as well as in residential areas with demonstrated demand in order to foster innovation, drive job creation and stimulate economic growth.
* Provide free or heavily discounted 10-100 MB (minimum) Internet service over a wired or wireless network to underserved and disadvantaged residential areas across the territories and diverse demographics.
* Deliver gigabit Internet service as prices comparable to other gigabit fiber communities across the nation. [[30]](#footnote-30)

Prospective companies must submit their applications by November 18, 2014. This RFQ presents an opportunity for Connecticut to remain at the forefront of broadband technology.

Creating “Gigabit Networks” in Connecticut cities will build upon “Gigabit Networks” already present in the State. UCONN and the UCONN Health Center are members of Gig.U, which is a consortium of over 30 research universities with the goal of deploying high speed networks at leading US universities. UCONN’s partnership will provide a foundation for research and for economic development:

* Ripe for benefits from the Gig.U initiative are academic facilities such as the Cell and Genome Sciences (CGS) building, which houses the UConn Stem Cell Institute and The Richard D. Berlin Center for Cell Analysis and Modeling (CCAM); and the Jackson Laboratory for Genomic Medicine.
* UCONN and its region have begun work on the Storrs Center project, along Storrs Road (Route 195), directly across from the University of Connecticut, designed to make it the new town center of Mansfield and the surrounding region. Using the Gig.U collaborative process will allow UConn to help provide high-speed fiber broadband service to the entire area and will simplify a tie into UConn’s fiber backbone project in its Master Plan to expand that part of campus.[[31]](#footnote-31)

## Other Initiatives in CT

### Open Data Policy and the Connecticut Data Portal

In February 2014 Governor Malloy announced by Executive Order the creation of the Connecticut Open Data Portal.[[32]](#footnote-32) The Portal is a collection of state agency data freely available to the public at data.ct.gov. The Portal will be managed by the Connecticut Office of Policy and Management.

The creation of the Portal follows recent national and state trends toward “open data” initiatives. Open data is based on the idea that data should be publicly available, easily accessible, and can be republished without copyright or other legal infringements.[[33]](#footnote-33) Connecticut agencies hold a plethora of valuable data such as data on labor, public health, government finances, education, public safety, and more. With the creation of the Portal, data will be in a centralized location facilitating easy access for the public.

Further, access to a high speed broadband connection would enhance the Data Portal experience for the user. The user would be able to access and download the data at high speeds. Further, high speed broadband would be indispensable to researchers and businesses that download large data sets for analysis. Connecticut’s plans to expand broadband access effectively works in tandem with its open data policy initiative.

### The Connecticut Data Collaborative

The Connecticut Data Collaborative is a public-private partnership created to advance effective planning and decision-making in Connecticut at the state, regional and local levels through the use of open and accessible data. The Collaborative serves residents; nonprofits, policymakers, and funders in using data to drive policy, program and service improvements. The Collaborative’s mission includes building a robust learning community of data generators and data users to advance:

* The quality and availability of data and
* Its use in policy and planning at all levels of government and nonprofit enterprise.

To achieve its mission, the Collaborative produced a web-based data portal, www.ctdata.org, which provides access to extensive state and federal data in a common format with powerful visualization tools; the implementation of data projects on which we partner with others to present specific data related to pressing policy issues; and facilitating events and projects to build the collaborative learning community. CTdata.org serves as another example of a data tool that can be extraordinarily powerful when coupled with advanced broadband technologies.

## Why Would CT Want Gig Service?

### Case Studies

#### Kansas City, Kansas

In the early 2000s, Kansas City’s local public utilities board wanted to build the infrastructure for Fiber connectivity, but the challenge was to figure out how Kansas City, with a population of about 147,000, could finance such a large project on its own. Former Mayor Joe Reardon thought Kansas City’s current infrastructure was at risk of decay and understood that high-speed broadband would be vital for his city’s future. Reardon stated, “Gigabit Internet is something we’re going to accept in 10 or 20 years as essential and as normal as water or electricity.”[[34]](#footnote-34)

In February 2010, Google announced its first plans for an ultra-high-speed broadband. Google initiated a call for governments to complete a request for information, and more than 1,100 cities from across the country applied. Google’s Fiber City Checklist had cities submit data on their existing infrastructure and speed and predictability of construction. Google’s plan was to offer a city its Google Fiber service, and then implement its marketing technique, crowdsourcing. Crowdsourcing would incentivize neighbors in a specific location to sign up for Google Fiber because it requires a minimum number of installations per location before implementation.[[35]](#footnote-35)

When Google announced its Google Fiber plan, Reardon thought Kansas City still hadn’t found a solution for creating an infrastructure of Fiber’s magnitude. However, Kansas City submitted its application and showcased how it had previously worked with private partners. These public-private partnerships helped create the Kansas City Speedway, Kansas City’s Sporting Park stadium and Legends Outlet Mall. Additionally, Kansas City was able to work with the Board of Public Utilities in order to implement Fiber infrastructure.[[36]](#footnote-36)

On March 30, 2011, Google announced it had chosen Kansas City to be the first city to implement Google Fiber. Reardon said there were two reasons as for why Kansas City rose above the competition: the city provided the resources needed to move through the administrative process quickly, and the unnecessary regulations during the permitting process were eliminated.[[37]](#footnote-37) In addition, Kansas City offered access to public rights-of-way, offered space in city facilities and provided assistance with marketing and public relations.[[38]](#footnote-38) Milo Medin, Google’s vice president of access services stated, “We wanted to find a location where we could build quickly and efficiently. Kansas City had great infrastructure. The utility there had all kinds of conduit in it that avoids us having to tear the streets open.”[[39]](#footnote-39)

The Google Fiber project, however, saw month-long delays from disputes over fiber installation processes, material and installation costs, outdated pole attachments, government rights-of-way and regulations. Google’s Vice President of Access Services Milo Medin stated, “Governments across the country control access to the rights-of-way that private companies need in order to lay fiber. And government regulation of these rights-of-way often results in unreasonable fees, anti-investment terms and conditions, and long and unpredictable build-out timeframes.”[[40]](#footnote-40) Even though Kansas City had the adequate infrastructure and offered access to public rights-of-way, there were still many issues with its installation process.

Google Fiber has Internet speeds up to 1,000 Mbps, which is 150 times faster than today’s basic broadband speed of 6.7 Mbps. Its rates start at $70 a month for Internet service or $120 a month for Internet and television service. Additionally, free Internet service is available at 5 Mbps for a $300 construction fee.[[41]](#footnote-41) Google Fiber’s gigabit service is priced much lower than Chattanooga’s rate of $350 a month. The price discrepancy is primarily caused by Google having built its own network; Google uses a fiber-optic cable that is reliable and has a high capacity; local traffic on a network is essentially free; and scaling due to consumer attraction to large, interconnected networks.[[42]](#footnote-42)

Critics of Google Fiber believe it has caused a digital divide between high and low-income families, and it has only served to highlight the current internet distribution problem. A recent Kansas City School District study found only 40 percent of its students had an at-home Internet connection to use with school-issued computers. Students are now being issued laptops or iPads for learning purposes, but they are not beneficial if Internet access is not available at home. Google Fiber’s free Internet service plan costs only $300 for construction fees. However, low-income families tend to rent; it does not make fiscal sense to wire their homes. Landlords of low-income apartments typically will not pay for the construction fee; owners feel as if they cannot raise their tenant’s monthly rental fee much higher, thus, Google Fiber does not provide these landlords with much value. [[43]](#footnote-43)

Recent research by Bernstein Research indicates tremendous progression for Google Fiber. According to a recent door-to-door survey of about 350 homes, Google Fiber now offers service to about 75% of Kansas City homes. While the critics of Google Fiber believe that low-income consumers are at a severe disadvantage, the study also specifies that Google’s penetration captured three-fourths of homes passed in medium-to-high income neighborhoods and nearly 30% of lower income neighborhoods.[[44]](#footnote-44)

The potential benefits of Google Fiber include: higher tax valuations from rising home values; more tax revenue for the city; more jobs stimulated by entrepreneurs and technology start-ups relocating or starting a company in the city; and the new perception of Kansas City entrepreneurialism. Google already cited studies with anecdotal evidence indicating a direct correlation between Fiber connectivity and increased home values by $2,000 to $5,000. The increase in home values will lead to higher tax valuations and more tax revenue for the city. In addition, thousands of contract jobs are now available for Fiber installation. While many contractors do not work for local companies, contractors are spending money in Kansas City while they work there. When it comes down to it, it is still too early in Google’s grand experiment to point to tangible, quantifiable benefits from the gig, although there seem to be some promising results.[[45]](#footnote-45)

What is yet to be determined is if a gigabit of Internet is even necessary. Offering a gigabit of Internet is a great marketing tactic that can potentially have a profound effect on entrepreneurship and innovation. A pessimistic individual would agree that a city would need costly technologies to make the most of a gigabit, and that there is no benefit of watching five high definition movies simultaneously at light-speeds. Conversely, one might need a gigabit connection to inspire the creation of those same technologies. Therein lies the gigabit paradox. At the moment, a truth running through the Google Fiber project is that there is a limit to what a gigabit of Internet connectivity is good for. [[46]](#footnote-46)

There are both benefits and challenges to Google Fiber, and it will take additional years and more equitable implementation before it can be deemed a complete success. The lesson may be there are select few who can duplicate the gigabit connectivity, and that building one’s own network or investing in improving infrastructure should never be ruled out. A typical citizen would agree that Internet availability and speed is important for economic prosperity. Google Fiber provides superior Internet speeds and its availability is improving, but it is still too early for any sweeping conclusions.

#### Austin, Texas

Austin, Texas, has long been considered to be a center for technology and innovation. There are multiple initiatives that have contributed to the success of Austin’s technology sector. These include the: Telecommunications Infrastructure Fund (TIF), Austin Free-Net (AFN), and Austin Technology Incubator (ATI). Austin’s technology sector is reported to employ approximately 100,000 individuals. A few of its employers include: Dell, Inc., IBM Corp., Advanced Micro Devices and Apple Computer, Inc.[[47]](#footnote-47)

The Telecommunications Infrastructure Fund (TIF) is considered to be the most significant of Texas’s information technology initiatives. Established in 1995, its goals are to: develop a broadband communications capability for businesses, residences, and institutions; deploy broadband technologies within city government to improve efficiency; and promote access to information technologies to the low-income population. These goals have been met through a proposed franchise agreement with Central and South West Communications, and the development of the Greater Austin Area Telecommunications Network (GAATN) and the Austin Free Net (AFN). A franchise fee as compensation for use of Austin’s public-rights-of-way and a fiber-optic network that links all participating public institutions has been enacted due to the TIF.[[48]](#footnote-48)

The Austin Free Net was initiated in 1995, and has a goal of providing universal public Internet access and training to help its citizens acquire the skills necessary to succeed in the digital age. AFN had discovered that the main technology barriers in Austin were not related to cost per month for connectivity, but rather to equipment costs and training. Therefore, AFN has continued to focus on training exercises in order for its citizens to become less intimidated of information technology. AFN’s training activities occur in community centers, job training sites, churches, and schools. This allows for Austin citizens to work collectively on their information technology training.[[49]](#footnote-49)

The Austin Technology Incubator (ATI) operates through the University of Texas at Austin. ATI has a 25-year track record of advising companies on how to raise capital. It offers two to four hour strategy sessions to identify key issues facing one’s company. ATI has helped more than 250 companies raise over $1 billion in financing to date and has seen an 85% success rate. In 2012, fifteen of its startups raised at least $1 million, and five raised at least $5 million.[[50]](#footnote-50) According Austin Chamber of Commerce, Austin is one of the top areas for venture capital investment in the country, garnering $621 million in 2012, with software and semiconductor firms receiving about 43 percent of the funding.[[51]](#footnote-51)

The aforementioned technology initiatives have helped construct Austin’s technology sector; however, technology sectors can be extremely volatile with their employment numbers tending to fluctuate. This volatility was seen during the Dot-com bubble, which was one contributor to the 2001 recession, and the recession that began in December of 2007. Austin was subject to decade-long reverberations that reshaped its technology sector’s capital investment outlook. Instead of free-flowing venture capital, Austin’s venture capital scene underwent a contraction, and startup companies were forced to consider more creative financing. But five years later, local analysts and economists are optimistic about the future of Austin’s technology sector. With local tech jobs potentially reach 101,000 this year, Austin’s technology sector will have 12 percent of the metro area’s roughly 855,000 jobs.[[52]](#footnote-52)

Austin’s current technology sector and its technology initiatives are improving the flow of information technology to all of its citizens. Austin government officials understood that in order for a more prosperous technology sector and to compete against other domestic cities, the city required private company offerings of state-of-the-art broadband Internet services. In February 2010, Google announced that it had plans to develop an ultra-high-speed broadband Internet service. One would expect Silicon Valley or Austin, both major technology hubs that applied for the announced gigabit, to be the first cities to implement Google’s new technology. However, on March 30, 2011, Google announced it had chosen Kansas City, Kansas, to be the first city to implement Google Fiber.

Google’s Fiber City Checklist had cities submit data on their existing infrastructure and speed and predictability of construction. Google believed that Kansas City, Kansas, had the required infrastructure and public-private partnerships for Fiber implementation. Though other cities were disappointed, Google did state that it would eventually offer its Fiber service to other cities pending its rollout in Kansas City, Kansas. Kansas City, Missouri, was the next city to implement Google Fiber, and on April 9, 2013, Google announced its next stop would be Austin, Texas. According to Google Fiber’s blog, the Austin rollout was attributed to “its creativity and entrepreneurialism, with thriving artistic and tech communities, as well as the University of Texas and its new medical research hospital.”[[53]](#footnote-53)

Google announced that pricing would be similar to that in Kansas City. In Kansas City, Google Fiber has Internet speeds up to 1,000 Mbps. Its rates start at $70 a month for Internet service or $120 a month for Internet and television service. In addition, free Internet service is available at 5 Mbps for a $300 construction fee.[[54]](#footnote-54) The problem for local competition was that they did not offer any gigabit service nor have as affordable of prices as Google. Therefore, LiveAir Networks, Grande Communications, and AT&T developed their own Fiber technology in order to compete against the technology giant. Google, however, continues to delay its Fiber launch because it must apply for public rights-of-way. It is still not clear when Google Fiber will be available to Austin citizens. Competitors that are currently offering gigabit services are benefiting from Google’s continued delays because of their market penetration capabilities.

LiveAir Networks is a Texas-based Internet service provider that started as a wireless-only Internet service provider, and today operates a fiber network stretching across thousands of square miles of Texas. After Google’s announcement, LiveAir developed a network that would support one gigabit services via the FTTH infrastructure. It now offers a $75 a month gigabit plan to select areas, and expansion plans will be contingent on the number of signups received online. The gigabit competition in Austin is fierce and has led to regional equitability concerns. LiveAir Network’s CEO stated, “Fiber-based Internet has traditionally been limited to urban areas, such as Verizon’s FIOS, AT&T U-Verse, and Google Fiber. Our rural communities are getting bypassed.” LiveAir Network has plans of differentiating itself from the competition by starting its own FTTH project in Eastern Central Texas, which will kick-start a new chapter in the areas’ economic development.[[55]](#footnote-55)

Grande Communications is a small, San Marcos-based telecommunications firm that uses fiber optic networks. Its Power 1000 plan now offers gigabit service to approximately one-quarter of the 75,000 homes and businesses already wired in the Austin area. Grande Communications’ decision to begin offering gigabit service was in part due to Google’s announcement of Google Fiber and the desire and readiness of Austin citizens to have a gigabit. President Matt Murphy stated, “Once competition in the Austin area heated up, we knew we had to be nimble and do things faster and made a conscious effort to beat Google.” Grande Communications is currently assessing expansion plans for other cities in Texas, although no official timeline has been released. Its Power 1000 plan is $65 per month with a one-time $20 installation fee.[[56]](#footnote-56)

AT&T is an American [multinational](http://en.wikipedia.org/wiki/Multinational_corporation) [telecommunications](http://en.wikipedia.org/wiki/Telecommunications) corporation that is headquartered in [Dallas](http://en.wikipedia.org/wiki/Dallas), [Texas](http://en.wikipedia.org/wiki/Texas). Its new U-verse GigaPower plan will eventually offer gigabit service to Austin citizens. However, U-verse GigaPower will only have speeds up to 300 megabits per second. AT&T has committed to upgrading its network to a full gigabit-per-second connection in order to compete against Google and local Internet service providers. AT&T wants to then expand U-verse GigaPower to San Antonio, San Jose and Atlanta; all of which are cities named by Google as potential homes for Google Fiber. This proposed expansion will allow AT&T to compete with Google in 14 markets where Google plans to bring its rival service, Google Fiber. AT&T’s pricing will be similar to that of Google, with gigabit service plans at $70 per month.[[57]](#footnote-57) It is clear AT&T’s strategy is to offer a similar gigabit service plan in the same locations as Google. This will allow AT&T to acquire some of the existing consumer base that demands gigabit services in locations that Google will offer its services to.

The potential benefits of having gigabit service include: higher tax valuations from rising home values; more tax revenue for the city; and more jobs stimulated by entrepreneurs and technology start-ups relocating or starting a company in the city. Google already cited studies in Kansas City where there is anecdotal evidence indicating a direct correlation between Fiber connectivity and increased home values by $2,000 to $5,000. The increase in home values will lead to higher tax valuations and more tax revenue for Kansas City. In addition, thousands of contract jobs are now available for Fiber installation. While many contractors do not work for local companies, contractors are spending money in Kansas City while they work there.[[58]](#footnote-58) Although there seem to be some promising results in Kansas City, it is still too early to make any sweeping conclusions in Austin. Since there are more companies offering gigabit service in Austin than there are in Kanas City, the benefits may be even more prominent in Austin due to the increased availability of a gigabit.

#### Chattanooga, Tennessee

Chattanooga, Tennessee, was once considered a bustling, industrial city with a prosperous manufacturing sector. Located in the southern end of Tennessee Valley, Chattanooga’s proximity to the Tennessee River allowed for efficient transportation of its manufactured products. In 1970, 30.4 percent of Chattanooga citizens were employed in the manufacturing sector. However, the composition of the nation’s labor market began to change with the emergence of technology. Between 1980 and 1990, Chattanooga experienced robust deindustrialization when its manufacturing sector declined 28 percent. This was significantly more than the country’s manufacturing decline of 7 percent during this decade. (Brookings)

Chattanooga had also begun to experience the first effects of suburbanization. Suburbanization occurs when adjacent locations of one’s city experience population increases at the expense of a declining city population. From 1950 to 1970, Chattanooga’s overall population decreased by 9 percent and its white population declined nearly 17 percent; meanwhile, the adjacent parts of Hamilton County saw their populations increase by 75 percent. The primary reasons for Chattanooga’s suburbanization issues were its declining manufacturing sector, lackluster environmental standards, racial tensions, and affordable housing. In fact, the federal government once declared that Chattanooga had the most polluted air of any city in the United States. During the daytime, Individuals had to drive with their headlights on because of the pollution. (Brookings)

Chattanooga government officials knew that change was necessary in order to combat the negative economic and population trends that occurred in the city for multiple decades. In 1984, a strategic plan known as *Vision 2000* was one of the city’s successful initiatives to help restore its prosperity. *Vision 2000* called for a downtown aquarium; advocated preserving the Walnut Street Bridge; and initiated the creat­ion of more affordable housing and a family violence shelter. By 1992, the Tennessee Aquarium officially opened as the world’s largest freshwater aquarium, and the revitalization of downtown was underway. Subsequently, the Walnut Street Bridge reopened shortly after the Tennessee Aquarium, which created a direct link between the commercial strip along Frazier Avenue in north Chattanooga with downtown, the Aquarium, and the River Park. Continued investment helped create the Creative Discovery Museum, a children’s museum that opened two blocks from the aquarium, and a downtown movie theater a few years later. (Brookings)

Chattanooga’s strategic initiatives entailed extensive planning, citizen engagement, public-private partnerships, and smart investments in transformative projects. These initiatives came to be known as “the Chattanooga way,” which accurately depicts how Chattanooga was transformed from a deserted and polluted city to highly regarded tourist attraction. In addition, structural unemployment began to subside from the growth in employment that directly related to tourism, and the finance and insurance sector. During the 1990s, employment in leisure, hospitality, accommoda­tions, and food services had increased by 26 percent in Hamilton County, which is where Chattanooga is located. Between 1990 and 2000, Chattanooga’s finance and insurance sector employment had increased by 13 percent. (Brookings)

Electric Power Board (EPB) deserves the credit for being the most influential in Chattanooga’s astonishing economic transformation. Owned by the city of Chattanooga, EPB serves 170,000 households and businesses in the Chattanooga metro area and surrounding communities and is one of the largest public power utilities in the nation. EPB began transforming Chattanooga after its initial investments in fiber optics in the late 1990s, and its approval from the Tennessee Regulatory Authority (TRA) to begin building telephone networks. Subsequently, EPB expanded into broadband services after its approval to do so in July of 2002. In 2007, EPB then committed to a fiber-to-the-home network that would be powered by a “Mensa grid,” which would be more advanced than the traditional smart grid technology. The new grid would create fiber optic connections through a wireless mesh network, while ensuring the most reliable, fastest transmission of data. (3 CS)

A couple complications with building a municipality owned network are the funding and private sector lawsuits. EPB’s Electric division issued a bond in order to receive $162 million to build the fiber optic network, $39 million for electric equipment such as transformers, $26 million to cover the first three years of interest payments, and the remainder to cover the financing charges. In addition, EPB’s Electric division would provide a loan of no more than $60 million to finance the Fiber Optics division startup costs. As for private sector lawsuits, Tennessee Cable Telecommunications Association (TCTA) began strategically filing court claims alleging cross-subsidization between EPB divisions. Comcast would then begin filing lawsuits before public voting on aspects of the fiber optic network. It seemed as if both Comcast and TCTA had one goal in mind: disrupt and delay such voting by casting uncertainty on the project status. This only succeeded in stalling the network, but Comcast did have extra time to get small businesses locked into long-term contracts and to invest $15 million in order to launch its “Xfinity” services in Chattanooga. (3 CS)

On September 15, 2009, Chattanooga announced that it would officially start offering broadband internet connections. Shortly after, EPB received a $111 million grant from the Department of Energy, which would rapidly roll out its smart grid and eventually complete its 10-year deployment plan in less than three years. EPB initially offered plans at 100 Mbps, but soon increased its highest capacity package to 150 Mbps. Local cable companies were already advertising speeds of 100 Mbps, though they offered much slower upload speeds and did not have a 100 percent fiber optic network. One year after EPB’s initial Internet offering, it announced that Chattanooga would be the first community in the United States to have a gigabit of Internet. EPB would charge $350 a month for gigabit service; however, this was still inexpensive compared to many private broadband providers at that time. (3 CS)

### Google Checklist for Considering Gig Service

* Provide information about existing infrastructure
  + Gather and submit all required data.
  + Identify which infrastructure and/or data is now owned, operated or controlled by the city.
* Help ensure access to existing infrastructure
  + Provide description of any existing state laws, local ordinances, and/or commercial agreements.
  + Ensure Google and other service providers have access to these rights.
* Make construction speedy and predictable
  + Review the Google Fiber Permitting, Construction, and Maintenance Plan and identify where your city’s current practices differ. If there are differences, please explain why and outline ideas to accommodate a large network build with accelerated timelines.
  + Upload your existing permit application and final Hut License.
  + Identify any local, city or state-wide requirements that may impact a network build by reviewing and responding to the list of Construction Constraints List.
* RFIs for select municipalities

## Resources

### **Nutmeg Network**

The Nutmeg Network is a statewide, fiber-optic infrastructure that improves upon and expands the availability of high-speed networking in the State of Connecticut. There are 169 towns that benefit from fiber optic cable, including many that are currently underserved, making it logistically and strategically less burdensome for municipalities to procure their own fiber connections throughout the state. The Nutmeg Network is funded by the Broadband Technology Opportunity Program, which awarded Connecticut with $93.8 million. The 20% state match requirement is satisfied through the funding of $23.4 million from the DESPP E911 surcharge. Overall, the total initial production budget is $117.3 million, which will be allocated strategically in order to upgrade and expand Connecticut’s existing broadband communication.[[59]](#footnote-59)

The Nutmeg Network consists of:

* Public Safety Data Network (PSDN): The Public Safety Data Network creates a highly dependable (redundant) and secure network that supports vital public safety and first responder applications for NG911, Collect and the P25 Radio System. The Department of Energy Services and Public Protection runs the project, and its objective is to create a secure, robust and redundant network to support the exclusive needs of Public Safety/First Responders. [[60]](#footnote-60)
* Connecticut Education Network (CEN): The Connecticut Education Network’s goal is to create enhanced connectivity (up to 1Gpbs) to approximately 432 educational related locations including: 231 K-12 schools, 146 libraries, 44 college and universities and other higher education facilities, 6 CPTV sites and other community support facilities. By increasing the capacity to individual sites (up to 1GB to sites on 10GB rings) and overall backbone capacity (10 and 20GB today, 400 GB +), the network will deliver new services (e.g. L2 VPN). [[61]](#footnote-61)

On July 7, 2010, the State Board of Education adopted the Common Core as Connecticut’s K-12 standards in English, language arts and mathematics. The Common Core State Standards have been adopted by 45 states, and are designed to provide children the knowledge necessary for college and their career. These standards require states to determine a student’s strengths and weaknesses before progressing. The Connecticut Education Network’s goal to enhance connectivity to educational institutions will only improve and add dimensions to the Common Core’s learning techniques. Additionally, Governor Dannel P. Malloy recently announced Connecticut Core, which will provide additional funding in support of the Common Core Standards.

### **CT Government Management Information Systems (GMIS)**

CT GMIS is a state association of municipal CIO’s, who are developing systems to provide for regional sharing of costs and assets. The purpose of GMIS is to provide a forum for the exchange of ideas, information, and techniques, thus, fostering enhancements in hardware, software and communication developments as they relate to government activities. CT GMIS has pushed the legislature to open networks to full ARRA participations and for Muni-to-Muni sharing. This will result in the connection of all Municipal departments.[[62]](#footnote-62)

### **FirstNet**

Signed into law on February 22, 2012, the Middle Class Tax Relief and Job Creation Act created the First Responder Network Authority (FirstNet). The law gives FirstNet the mission to build, operate and maintain the first high-speed, nationwide wireless broadband network dedicated to public safety.[[63]](#footnote-63) The FirstNet Nationwide Network (FNN) is intended to be a wireless, interoperable nationwide communications network that will allow members of the public-safety community to securely and reliably gain and share information with their counterparts in other locations and agencies. Connecticut is among the states that took an early lead in planning for FirstNet, and it is a member of the FirstNet Public Safety Advisory Committee.[[64]](#footnote-64)

### Gig.U

The University Community Next Generation Innovation Project, or Gig.U, is a broad-based group of over 30 leading research universities from across the United States. Drawing on America’s rich history of community-led innovation in research and entrepreneurship, Gig.U seeks to accelerate the deployment of ultra-high-speed networks to leading U.S. universities and their surrounding communities.[[65]](#footnote-65) Improvements to these networks drive economic growth and stimulate a new generation of innovations addressing critical needs, such as health care and education. [[66]](#footnote-66) Gig.U presents UConn, in partnership with its local communities, with the opportunity to become part of an organized, national movement with successful research universities already engaged in advancing their own fortunes and those of their communities to seize the high ground of broadband access at global speeds and connections. UConn and its local regions have begun work on the Storrs Center project, a town center that will have a mix of restaurants, shops, offices, homes, walkways, and green spaces. Using the Gig.U collaborative process will allow UConn to help provide high-speed fiber broadband service to the entire area and will simplify a tie into UConn’s fiber backbone project in its Master Plan to expand that part of campus.[[67]](#footnote-67)

### National Broadband Map

The National Broadband Map (NBM) is a searchable and interactive map that provides the public with the opportunity to view broadband availability across the United States. The NBM was created by the National Telecommunications and Information Administration (NTIA), in collaboration with the Federal Communications Commission (FCC), and in partnership with 50 states, five territories and the District of Columbia. The NBM is part of NTIA's State Broadband Initiative. The NBM is updated approximately every six months and was first published on February 17, 2011.[[68]](#footnote-68)

### Office of Consumer Counsel

As Connecticut’s Broadband Coordinator, the Office of Consumer Counsel has decided the state needs to expand its broadband access in order to make Connecticut globally competitive and build economic development and jobs. The Office of Consumer Counsel has brought Gig.U and UConn together because it believes its federal funds may accelerate the offering of ultra-high-speed network services to the state’s communities. OCC’s driving principle for increasing broadband access and adoption across Connecticut is that continued reliance on the business plans developed in Internet service provider boardrooms to drive good public policy will not create the research-innovation cycle that Connecticut needs right now.[[69]](#footnote-69)

## 

## How to Get More Information

* Broadband Coordinator Contact Information (for Policy)
* Broadband Providers Contact Information
* Links to summaries of past conferences and events
  + April 2014 broadband conference
  + RFI and press release

## Appendix A: Broadband in CT (Usage statistics)

### Table 1: Percent of Households with Broadband, Connecticut Compared to other US States

|  |  |  |
| --- | --- | --- |
| **Rank** | **State** | **% of households with broadband** |
| **1** | Utah | 80 |
| **2** | New Hampshire | 78 |
| **3** | Washington | 77 |
| **4** | Massachusetts | 76 |
| **5** | *Connecticut* | 75 |
| **5** | Oregon | 75 |
| **5** | Kansas | 75 |
| **Source: FCC International Broadband Data Report, Third Report DA, August 21, 2012 (data from 2010 NTIA)** | | |

### Table 2: Percent of Households with Broadband, Connecticut Compared to OECD Countries

|  |  |  |
| --- | --- | --- |
| **Rank** | **Country** | **% of households with broadband** |
| **1** | Denmark | 84 |
| **1** | Korea | 84 |
| **2** | Finland | 81 |
| **3** | Netherlands | 80 |
| **3** | Norway | 80 |
| **3** | United Kingdom | 80 |
| **4** | *Connecticut* | 75 |
| **5** | United States | 68 |
| **Source: FCC International Broadband Data Report, Third Report DA, August 21, 2012 (data from 2010 NTIA)** | | |

### Table 3: Average Peak Connection Speed, Top 10 States–Third Quarter 2013

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Rank** | **State** | **Q4 '13**  **Peak Mbps** | **Quarter over Quarter Change** | **Year over Year Change** |
| **1** | Massachusetts | 63.8 | 23% | 60% |
| **2** | New Jersey | 60.8 | 24% | 48% |
| **3** | Virginia | 59.2 | 21% | 54% |
| **4** | Washington | 57.7 | 24% | 62% |
| **5** | Maryland | 57.0 | 15% | 44% |
| **6** | *Connecticut* | 56.9 | 33% | 57% |
| **7** | New Hampshire | 56.7 | 24% | 43% |
| **8** | District Of Columbia | 54.8 | 14% | 26% |
| **9** | New York | 54.2 | 20% | 38% |
| **10** | Delaware | 52.8 | 9.7% | 38% |
| **Source: Akamai, "State of the Internet,” Volume 6, Number 4, 3rd Quarter 2013** | | | | |

### Table 4: Average Peak Connecticut Speed, Top 10 Countries/CT–Third Quarter 2013

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Rank** | **Country/State** | **Q4 '13 Peak Mbps** | **Quarter over Quarter Change** | **Year over Year Change** |
| **1** | Hong Kong | 68.0 | 3.9% | 16% |
| **2** | South Korea | 64.4 | 1.3% | 56% |
| **3** | Singapore | 59.1 | 18% | 56% |
| **4** | *Connecticut* | 56.9 | 33% | 57% |
| **5** | Israel | 54.6 | 14% | 68% |
| **6** | Japan | 53.7 | 3.4% | 22% |
| **7** | Taiwan | 50.9 | 19% | 74% |
| **8** | Romania | 50.6 | 11% | 15% |
| **9** | Latvia | 48.8 | 13% | 22% |
| **10** | Switzerland | 44.2 | 15% | 23% |
| **11** | United States | 43.7 | 18% | 32% |
| **Source: Akamai, "State of the Internet, “Volume 6, Number 4, 3rd Quarter 2013** | | | | |

1. National Foundation for Credit Counseling online poll of 3,148 individuals conducted June 1-30, 2011 [↑](#footnote-ref-1)
2. Computer Network Will Connect Justice Agencies, *Hartford Courant*, September 20, 2011 [↑](#footnote-ref-2)
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