Access and Inclusion in the Digital Age
A Resource Guide for Local Governments
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This resource guide is the product of a collaborative effort among:

- City of Chattanooga, Tennessee
- City of Gonzales, California
- City of Greensboro, North Carolina
- City of New Orleans, Louisiana
- City of Springfield, Missouri
- City of Youngstown, Ohio
- National Telecommunications and Information Administration
- National Resource Network

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Table of Contents

1 Introduction .................................................................................................................................... 3
   Background ................................................................................................................................. 3
   Using the Resource Guide ......................................................................................................... 4

2 Broadband Access and Digital Inclusion in the United States ...................................................... 5

3 Getting Started .......................................................................................................................... 10
   Assessing the Landscape ........................................................................................................... 10
   Engaging the Community .......................................................................................................... 12
   Setting the Goals ...................................................................................................................... 13

4 Strategies for Success ................................................................................................................ 15
   Developing the Program ........................................................................................................... 15
   Common Challenges and Solutions .......................................................................................... 18
   Monitoring Performance .......................................................................................................... 19

5 Finding Funding .......................................................................................................................... 21
   Local Funds ............................................................................................................................... 21
   External Grants ......................................................................................................................... 21
   Partnerships ............................................................................................................................. 23
   Fundraising ............................................................................................................................... 24

6 Engaging Partners ....................................................................................................................... 25
   Federal Agencies and Programs ............................................................................................... 25
   Nongovernmental Organizations .............................................................................................. 26
   State Agencies and Programs .................................................................................................... 28
   Private Sector ............................................................................................................................ 29
   Local Partners .......................................................................................................................... 30

7 Closing ......................................................................................................................................... 31

8 Appendix ...................................................................................................................................... 32
   Acronyms ................................................................................................................................. 32
   National and Global Statistics on Broadband Access and Digital Inclusion ......................... 33
1 Introduction

Background

*Access and Inclusion in the Digital Age* is a resource guide designed to support communities of all sizes and geographies in advancing their goals for expanding high-speed Internet access and digital inclusion. The guide was developed by a team of six cities that have all been active in enhancing broadband Internet access and addressing the digital divide in their respective communities. These cities include:

- Chattanooga, Tennessee
- Gonzales, California
- Greensboro, North Carolina
- New Orleans, Louisiana
- Springfield, Missouri
- Youngstown, Ohio

With support from the National Resource Network and the National Telecommunications and Information Administration (NTIA), representatives of the six cities communicated regularly about the broadband Internet access and digital literacy initiatives underway in their communities, highlighting major obstacles encountered and key lessons learned. By sharing information on programs, practices, challenges, and opportunities from their own communities, these six cities were able not only to learn from one another, but also to produce the following guide for the benefit of other communities as well.

Informed by experiences of these cities as well as research on national best practices, the resource guide outlines key steps for local governments to take in enhancing broadband Internet access and addressing the digital divide in their own communities. The document also provides useful information to support communities in engaging with potential partners, finding funding, and measuring and managing the performance of new or existing programs and initiatives.

The resource guide represents an innovative model for intercity collaboration and peer learning. While federal agencies, nonprofits, foundations, and private interests have produced much information on digital inclusion, a resource guide on this subject produced by a consortium of city leaders for the benefit of cities nationwide is unprecedented. The perspectives of the authors and the target audience are completely in alignment, which allows for greater sensitivity to the financial, social, and political realities that will impact communities seeking to launch new initiatives.

This resource guide is intended to be a tool to facilitate two-way communication. Rather than simply providing information in a static format, the resource guide will be the vehicle through which the six cities and other future participants continue to collaborate, build knowledge, and share resources. It will be a dynamic repository of best practices and key considerations that will evolve as the collective knowledge of participating communities grows.

The resource guide is the product of extensive communication and collaboration among the six cities. The vision of this group is that the document will not only provide valuable information to communities, but that it will also facilitate ongoing networking, resource sharing, and peer learning among a broader cohort of interested stakeholders.
Using the Resource Guide

The resource guide is intended to be a living document, updated regularly with new information from the original six cities, as well as ideas, questions, and resources from any other community interested in advancing its goals for broadband Internet access and digital inclusion.

The team envisioned the following applications for the resource guide:

- **Assessment**—Cities can use the resource guide to assess the current state of broadband Internet access and digital inclusion in their communities. The guide will provide national benchmarks and will help stakeholders to evaluate the economic and social impacts that the lack of digital access may have on their communities.

- **Planning**—The guide will also help cities to set attainable and impactful goals for increasing digital access in their communities. Once specific goals are established, stakeholders will be able to refer to the guide to learn about the strategies that other communities have implemented, what has proven successful, and what factors contributed to the success. This information can support users of the guide in developing their own strategies.

- **Implementation and Performance Management**—The guide will help users to achieve successful implementation of their initiatives by highlighting common obstacles or challenges encountered during implementation by other communities. Users will also be able to refer to the guide for information on commonly used performance measures and strategies for managing program performance.

- **Networking**—The dynamic and interactive nature of the guide will allow users to connect directly with one another to share specific resources or discuss common challenges or opportunities in greater detail.

- **National Dialogue**—The guide will not only facilitate direct city-to-city communication in support of local objectives, but it will also promote a broader dialogue in which communities can think strategically about ways that leadership at the local level can help to address the digital divide nationwide.

How to Navigate the Resource Guide

The resource guide is organized by topic area, and each area contains recommended best practices, case examples, and/or links to useful information and resources.

How to Contribute to the Resource Guide

The wealth of information compiled in the chapters to follow is a product of the leadership and initiative of the six core cities. Continued communication and participation among this group and beyond this group will be key to the ongoing success of this effort. As such, the resource guide is made available in GitBook format. GitBook is an online platform for developing and sharing open-source publications. The collaborative GitBook format allows for readers to add questions, ideas, and resources that can be used to keep the document up-to-date and keep the dialogue on digital inclusion moving forward.
Over a relatively short period of time, availability of the Internet and the meaningful usage of online services and applications has become a necessity for functioning in modern society. For billions of people worldwide, the Internet is an essential tool for learning, doing their jobs, and connecting with one another. This important resource facilitates creativity and exponential change in our society, as users are able to create new products and services that continue to transform life in the twenty-first century. Yet, in many areas in the United States, a lack of affordable Internet access or digital skills excludes many from the opportunities that high-speed Internet offers. As reported by the U.S. Federal Communications Commission (FCC), one in ten Americans does not have access to high-speed Internet. Further, 39 percent of rural U.S. residents lack high-speed Internet access.

As our society increasingly relies on the Internet for work, education, commerce, and leisure, lack of access becomes increasingly detrimental to those affected. In 1999, 32 percent of Fortune 500 firms recruited employees online. By 2007, 100 percent of Fortune 500 firms recruited employees online. While a job seeker in 2007 still had the option to apply for positions with Fortune 500 firms via mailed paper applications, by 2012, almost all Fortune 500 firms posted jobs and accepted applications exclusively online. In the span of five years, use of the Internet to apply for these jobs transitioned from an option to a requirement. Inability to apply for jobs online is just one example of the many disadvantages caused by gaps in digital access.

Realizing the importance of this issue, stakeholders at all levels of government and across sectors have been actively seeking solutions to achieve greater broadband Internet access and digital equity.

What Is “Broadband” Internet?

The term “broadband” is generally used to refer to high-speed Internet service. A number of technologies can be used to deliver broadband Internet service. These include:

- **Wireline Technologies**
  - **Fiber to the Premise (FTTP)** is the “gold standard” in broadband technology. FTTP is the most expensive to deploy, but can deliver consistently high speeds reaching 1 gigabit per second (1 Gbps = 1,000 megabits per second [Mbps]) and higher.
  - **Cable Modem** uses a coaxial cable connection to deliver broadband with download speeds historically ranging from 6 Mbps to more than 100 Mbps. The DOCSIS 3.1 standard allows speeds over 1 Gbps. Bandwidth is managed through shared connections.
  - **Digital Subscriber Line (DSL)** uses copper telephone lines to deliver broadband with download speeds generally under 10 Mbps. Aging networks can degrade service over time, which can decrease speeds delivered to the home.
  - **Broadband over Power Lines (BPL)** uses existing electric wiring along with fiber to deliver broadband through electric outlets. BPL requires special equipment installed at the home. This technology has seen limited deployments.
Wireless Technologies

- **Fixed Wireless** uses a combination of a fiber backbone and wireless towers to deliver broadband at speeds comparable to DSL. This technology can be quickly deployed at lower costs with a wide reach, but many plans have data usage caps. Different standards of fixed wireless exist (e.g., Worldwide Interoperability for Microwave Access [WiMAX], Long Term Evolution [LTE]).

- **Mobile Broadband** is a combination of cellular and data service generally for use on mobile devices. It typically complements wireline connections, but some companies provide home broadband service delivered over mobile broadband networks. Many plans have caps that limit usage.

- **White Space** is a new and emerging technology that uses the empty fragments of television spectrum scattered among frequencies. This technology is less expensive to deploy in areas without much existing infrastructure, and can broadcast a signal that travels through physical obstacles, such as trees and mountains, without diminishing, due to the usage of lower-frequency bands that allow signals to propagate farther. The FCC requires networks to follow strict requirements not to interfere with existing broadcasts.

A number of trials have been underway both domestically and globally.

- **Satellite** is a two-way transmission of Internet data passed between satellite and a dish placed at the home. Because data traverse long distances, latency delays can occur. Most plans have data caps.¹

As advances in technology continue to change the way that we live, work, and play, the accepted standard for Internet speed has changed over time. In 2015, the FCC updated its definition of broadband to represent a minimum speed threshold of 25 Mbps download and 3 Mbps upload. The previous standard for high-speed Internet was 4 Mbps download and 1 Mbps upload. To put these speed thresholds in a practical context, at 4 Mbps, it would take an estimated 2 hours and 46 minutes to download a two-hour video, while at 25 Mbps, the same video could be downloaded in an estimated 26 minutes.²

The change in the definition of broadband reflects the fact that Americans’ use of data-hungry applications such as streaming video has grown and that households often connect multiple devices simultaneously to the Internet. The FCC’s previous standard included Internet plans that would not allow people to use many modern applications or multiple devices at the same time.


While access to reliable, high-speed Internet is a requirement for closing gaps in access, adoption is another important element. In many communities, rates of adoption are lower among certain segments of the population even though Internet access is available. According to research conducted by the Pew Research Center, Internet use in the United States is significantly lower among individuals aged 65 and over, lower-income individuals, and individuals identifying as Black or Hispanic. The reasons for these differences vary, but advocates of digital inclusion frequently cite the cost of service, access to devices, and lack of digital skills as common barriers impacting these groups.

Unlike residents in geographically smaller nations, a large proportion of Americans live in sparsely populated areas. Rural communities in the United States are more likely to be underserved by private Internet service providers (ISPs). These companies prefer to spread construction costs over as many users as possible, as this lowers the cost per user and results in increased profit. Consequently, ISPs find it challenging to build networks in sparsely populated areas of the United States, leaving many rural residents to rely upon slow, dial-up service or very expensive satellite service. In less densely populated places, many residents lack access to high-speed Internet, or do not subscribe to the Internet due to low quality of service, unaffordable rates, or other drivers of low adoption (e.g., poor digital literacy, lack of perceived relevance).

According to the Pew Research Center’s Internet & American Life Project from 2013, 19 percent of survey respondents said they did not use the Internet due to price. Thirteen percent did not have a computer (likely because they could not afford one); another 6 percent said the Internet service itself was too expensive.³

According to the 2013 American Community Survey, computer ownership and Internet use are most common in homes with householders who fall into one or more of the following categories—younger, Asian, white, high income, urban, or highly educated.⁴ Patterns for individuals were similar. A report released by NTIA found the same trends to hold true in 2015.⁵

The Pew Research Center concentrates on the non-Internet-using peers of the people described above—15 percent of U.S. residents. In the United States, men and women are just as likely to not use the Internet; in contrast, women in many other countries are more likely than men to be offline. Blacks and Latinos are far less likely to use the Internet than Whites and Asians. Other people with a high likelihood of being


offline are the elderly, people with annual household income less than $30,000, people with a high school diploma or less, and rural residents. The following chart from Pew provides insight into offline U.S. residents.

Recently, Pew published research about Americans’ digital skills and trust using online sources to pursue online learning. The key finding is that 52 percent of U.S. adults are hesitant to use online learning. As more educational resources move online, these individuals will be at a severe disadvantage.

**The Impact of Expanding Broadband Access and Digital Inclusion**

The benefits of enhancing broadband access in the United States are significant. One economic study estimated that as early as 2006, spending on broadband accounted for $28 billion in U.S. gross domestic product. Broadband Internet also facilitates innovation and creativity, which in turn drive additional economic growth and global competitiveness.

While the economic benefits are clear, there are also important social benefits created by inclusive broadband access. Broadband Internet opens the door to a world of resources for learners of all ages. From early childhood to adult education, access to broadband increases educational opportunities exponentially. As many U.S. communities have seen through the growth of local tech communities, broadband access can also empower new entrepreneurs and foster greater civic engagement.

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6 Community-Based Broadband Solutions: The Benefits of Competition and Choice for Community Development and Highspeed Internet Access, Executive Office of the President, January 2015.
Maintaining a focus on equity and inclusion will ensure that all members of society have access to the resources that broadband Internet offers. For many living in the United States, these efforts will translate directly to improved economic mobility and enhanced quality of life.

**Local Government’s Role**

In the movement to expand reliable high-speed Internet access to all, local governments have an important role to play. This role can include assessing and addressing the unique needs of their communities, providing network access where the private market does not, convening public and private stakeholders to create or expand networks, and removing barriers to access by offering subsidies and digital literacy training.

Local governments can also pursue legislative and policy solutions to improve the availability of high-speed Internet in communities. These will include overcoming barriers such as:

- Hostile legal and political environment toward government involvement in broadband markets
- Internet service provider monopoly and duopoly leading to minimal competition in many communities
- High cost of building a fiber network.

Action by local governments could seed and nurture the infrastructure necessary for broadband access and incentivize improvement in digital literacy locally, regionally, and nationally. Given the rapid pace of technological advancement and the impact of broadband on U.S. communities, it will be increasingly important for local governments to take a leadership role in moving their communities toward greater access and inclusion.

3 Getting Started

For many communities, one of the most challenging questions is “where do I begin?” This chapter outlines key first steps in moving communities toward greater broadband access and digital inclusion.

Assessing the Landscape

- An important first step in any community broadband or digital inclusion initiative is assessing the current landscape and taking note of specific challenges or obstacles, as well as opportunities and available resources.
- A wealth of information is available to local leaders interested in understanding the current state of broadband access in their communities. Resources of federal agencies and other organizations can provide valuable context as communities begin to think about their greatest needs.

Existing Infrastructure and Service Availability

- The FCC regularly compiles a wealth of data on local broadband service. This information is publicly available on the FCC.gov website. Communities are likely to find the FCC’s Broadband Progress Report to be particularly useful. This valuable resource provides broadband information by state and county. There are also links to interactive maps. A specific address can be entered to return information about the availability of broadband access and speed in the area. The FCC also provides information on the number of fixed connections per 1,000 households (rates of adoption) by census tract and the number of fixed providers of residential service at various speeds.
  - Internet Access Service Reports: https://www.fcc.gov/reports-research/reports/Internet-access-services-reports/Internet-access-services-reports
- Some cities are also engaging their local tech communities to better understand existing service levels in different neighborhoods. By partnering with the community and civic hackers, the city of Louisville, Kentucky, launched a tool to help gain a better understanding of the quality versus cost of local broadband services. SpeedUpLouisville.com is a citizen engagement tool that identifies the areas of highest-quality service and the areas of greatest need. It works by collecting user-generated information about local broadband service speeds, rates, and service quality in the community. After collection, the anonymized data are displayed on an interactive map and made available for free download. The project aims to increase transparency about Internet service quality in Louisville.
  - Speed Up Louisville: http://poweruplabs.co/introducing-speed-up-louisville
- The FCC also offers resources for individuals and communities that want to test the quality of their wireline and wireless Internet.
People can download free Android and iPhone apps to test their mobile connections.

- Broadband Speed Resources: https://www.fcc.gov/general/broadband-speed

State Laws Impacting Municipal Broadband

- With regard to expanding broadband access, the local legislative environment may shape what is possible. State laws that favor incumbent ISPs may restrict direct municipal provision of broadband service to businesses or consumers. Currently, more than 20 states limit the creation or expansion of municipal broadband networks that serve the public.

- The American Legislative Exchange Council has supported state legislation to limit the expansion of broadband service with the naming convention "'State Name' Local Government Fair Competition Act." Despite the name, these laws can make it more difficult for municipalities and states to build broadband networks and serve the general public via those networks.

- State legislatures in Tennessee and North Carolina passed legislation that geographically limits the expansion of broadband access. This legislation presented challenges for Chattanooga, Tennessee, and Wilson, North Carolina, as both cities were seeking to expand their local broadband networks to adjacent communities. A 2015 FCC ruling, brought about by petitions from Chattanooga and Wilson, pre-empted the state laws that sought to limit expansion of broadband access in those communities. However, Tennessee and North Carolina appealed the ruling, and it was overturned by the Sixth Court of Appeals in 2016.

The Nature of the Digital Divide

- Local leaders should seek to understand the issues and factors contributing to the digital divide in their communities. National research suggests that lower-income residents, elderly residents, and racial and ethnic minorities are less likely to take advantage of high-speed Internet. An understanding of the underserved populations at the community level and the reasons that they are underserved will be critical in order to develop a strategy for greater digital inclusion.

- Digital literacy is a very important component of digital inclusion. Many individuals do not take advantage of high-speed Internet because they do not have (or do not believe they have) the requisite skills. A 2016 study by the Pew Research Center found that 52 percent of U.S. adults are not likely to use digital tools for learning due to their professed lower level of skills and trust in the online environment. Many communities conduct their own surveys of digital literacy to collect locally relevant data. Communities that have conducted local digital literacy studies include Chicago, Illinois, and Austin, Texas.


- High cost of service is another factor that can contribute to a lack of digital inclusion. Especially in smaller and rural communities that may have limited network infrastructure and few service providers, the monthly cost of broadband may be more than many residents can afford, or are willing to pay.

- Lack of access to a device may be another factor limiting local digital inclusion.
According to the U.S. Census Bureau, 16.2 percent of U.S. households in 2013 did not have a computer at home. Increasingly, smart phones are being used to access high-speed Internet, but a number of the applications most important to economic mobility (e.g., creating a resume, applying to a job, performing academic research) require a personal computer.

Engaging the Community

Proactively engaging the community is another essential first step for expanding broadband access and promoting digital inclusion. Community buy-in will be necessary for successful implementation of any program or initiative. Also, input from the community can help to inform program goals and priorities and raise awareness about community sensitivities that could create obstacles later on.

Identify a Lead Organization

Moving a community toward greater broadband access takes a host of players all working together on complex social and technical issues. Building broadband access calls for a collective impact effort. Research on collective impact suggests five conditions that can support success: a common agenda, shared measurement systems, mutually reinforcing activities, continuous communication, and a lead organization. For expanding broadband access, that lead organization is essential to catalyzing action, maintaining momentum, coordinating parts, and building the structure necessary for broadband access that suits the community. The lead organization is the entity that will maintain a day-to-day focus on broadband access.

To determine who that lead organization might be or to help a natural lead organization gain the subject matter expertise it needs, tap into networks of organizations engaged in similar activities. Next Century Cities, Mozilla Gigabit Foundation, National Digital Inclusion Alliance, Coalition for Local Internet Choice, Community Broadband Networks, and US Ignite link together “gig” cities across the nation, and seasonal conventions such as Gigabit City Summit (Kansas City, Missouri) provide easy opportunities to gain expertise.

Engage Other Participants

While a lead organization is key for moving a city toward greater broadband access, the lead organization must be the backbone of a greater network of stakeholders. The following key stakeholders should be considered for outreach as local leaders seek to engage the community in program planning and execution:

- The local business community
- The tech and start-up communities
- Local anchor institutions, such as universities and medical centers
- Schools and libraries

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• Existing ISPs
• Elected officials
• Local economic development organizations
• Local workforce development organizations
• Community advocates
• The philanthropic community (foundations and nonprofits).

Many cities have also found allies and stakeholders beyond the usual stakeholders. Police, housing authorities, and others may not initially appear to be allies, but might nonetheless become an important part of the broadband access picture. Either way, frequent outreach encourages broad participation.

Get the Public Involved
• It is also important to engage and educate the general public. Community education on the benefits and opportunities created by broadband will help to achieve buy-in. An engaged community can be the strongest messengers, help implement solutions, support strategic planning, and provide the lens through which design decisions are made.

Some cities have found that broadband access provides a unique subject for engaging citizens. In Seattle, Washington (Seattle Broadband Speed Test), broadband access leaders deployed apps that quickly tested user download speeds and mapped those speeds so that the community could contribute to building its own map of access. The app not only built wide support for action and lists of supporters, it also created transparency that held providers accountable for advertised speeds and helped them find market opportunities for expansion.

Setting the Goals

Clearly defining the goals of any program or initiative is an important first step. With multiple stakeholders representing various sectors of the community and having diverse perspectives, it is possible for ambiguity and incorrect assumptions to hinder progress. A clear statement of specific goals will serve to remove ambiguity and keep all actors focused on achieving the same objectives. The process of goal-setting is also very important. It requires all actors to share their perspectives and expectations with one another. This exchange of ideas can help the group to achieve a more holistic view of the most critical challenges to address and the possible solutions to those challenges.

Articulate Guiding Values

• Broadband access can take many forms, and how it is developed can shape the effects it has on the community. Therefore, it is important to convene the community to articulate guiding values that can serve as the criteria by which the lead organization makes decisions.

• Communities have found it difficult to maintain the sustained engagement necessary for a wide group of stakeholders to be part of every decision, especially when decisions have to be made quickly. Clarifying and articulating core values early on creates a set of standards and criteria for judgment that broadband access leaders can use to
guide decisions properly, without having to go back to the full range of stakeholders for every decision. Establishing guiding values creates a level of transparency and accountability, and also helps to spark excitement about the goals behind the work when many may have trouble visualizing what the end product may entail.

Define Specific Objectives and Targets

- When establishing the scope of a community’s goal, it is important for leaders to define the specific targets, considering the available resources and the desired outcome. Some communities may choose to set an easily attained goal to achieve early success that will help to build momentum. Others may favor a reasonably aggressive goal that is likely attainable, but may be a bit of a stretch for the community. Still others may choose to pursue a stretch goal that can serve to activate sectors of the community that might otherwise not be activated, but may not be ultimately attained.
- For larger and more aggressive goals, communities may consider embarking on a pilot project first, then progressing from there based upon initial successes or failures.
- Definitions of goals and targets will vary based on each community’s unique challenges and needs. For example, a goal of improved digital literacy may be defined in a range of ways, from the completion of training programs to a demonstrated ability to perform certain functions online. Leaders should ensure a common definition of goals and targets in the context of the digital literacy initiative.
- It is also important to articulate how the specific objectives of the initiative relate to the broader community priorities. Community priorities commonly related to broadband access include:
  - Encourage economic development and job creation
  - Promote public safety and reduce crime
  - Maintain infrastructure and provide sustainable growth
  - Provide exceptional customer service in a diverse work/community environment
  - Ensure fiscal stewardship, transparency, and accountability
4 Strategies for Success

The following section outlines key strategies and resources for success in advancing broadband access and digital inclusion.

Developing the Program

Deciding on a Broadband Network Type

There are many ways to bring broadband access to a community. After assessing the landscape of federal, state, and local legislative limits, cities should begin to weigh the pros, cons, costs, and viability of possible models of broadband adoption.

- **Municipal Broadband** - Municipal broadband deployments are funded and operated by local governments. This option may be more viable in a community with an existing municipal electric utility because broadband access may be deployed through that utility. Chattanooga, Tennessee—one of the first cities in the country to offer its citizens gigabit speeds—is among the most notable examples of successful municipal broadband implementation. Chattanooga’s community-owned Electric Power Board launched its gigabit service in 2009 following a $300 million network modernization investment.

- **Private Internet Service Providers** - Internet service providers such as AT&T and Comcast are offering high-speed connections in a growing number of cities across the United States. It is important to map the existing and planned services offered locally to fully understand the current landscape before exploring municipal options or approaching other private providers. Large anchor institutions such as museums or libraries may already be connected to private high-speed connections and may be able to help map existing connections. Just as with municipal fiber deployments, there are pros and cons to privately built broadband networks. Some private service providers, such as Google Fiber, deploy via a competition model. Entering such a competition may help a city to identify broadband priority areas and galvanize stakeholders, even if the community is not ultimately selected for service.

- **Cooperative Models** - As more communities seek ways to upgrade their fiber infrastructure and to offer high-speed Internet to their citizens, creative public-private partnership (P3) models of broadband implementation are emerging. In many communities for example, Internet service providers are leasing existing utility-built dark fiber networks. In this case, the utility that built the infrastructure gets the added benefit of being able to use the live fiber for metering, managing peak hours, and other functions while customers benefit from the new ISP option. The city of Santa Monica, California, began leasing dark fiber to businesses in 2006. As of 2014, the revenue brought in was more than enough to cover its $1 million per year operating cost. Each cooperative partnership will develop differently and present unique opportunities and constraints. In every case, however, it is critical for the agreement between the municipality and the private Internet service provider to be thoughtfully codesigned, accounting for day-to-day issues such as network maintenance and repair.
responsibilities as well as larger community issues such as public access points and connection prioritization for anchor organizations.

Exploring Scale Rollout Models

Communities have approached the rollout of fiber access in many different ways, driven by provider goals, community needs, and network limitations. As with selecting a model for broadband adoption, each scale and rollout methodology presents both benefits and challenges.

- **Fiber for All: Chattanooga, Tennessee** - Chattanooga is currently the only city in the United States where 1 Gbps speeds are available to every home and business in the legally available service area covered by the municipal utility EPB. Over 150,000 homes and businesses are connected to Chattanooga’s pervasive broadband network. High-speed service was immediately made available to every part of EPB’s service area from launch.

- **The “Fiberhood”: Kansas City, Missouri, and Kansas City, Kansas** - Google Fiber approached rollout in its first Google Fiber City via the Fiberhood Model: once enough customers in a given neighborhood expressed interest in the service, Google Fiber built the infrastructure and connected that community. Over time, more neighborhoods beyond the initial fiberhoods were connected, as were major anchor organizations. This model is interesting in that it creates gigabit “hot zones” within a city and creates opportunities for clustering network activation activities in a limited geographic area.

- **Leading with Anchor Organizations: Cleveland, Ohio** - Cleveland’s OneCommunity, a nonprofit organization, has led the rollout of an ultra-high-speed, open, and neutral fiber network to hospitals, academic institutions, and government organizations across Northeast Ohio. This anchor organization-driven network now spans twenty-four counties and 2,500 miles.

- **Leading with a Specific Vertical: Detroit, Michigan** - Detroit’s Rocket Fiber service focused initial rollout in the city’s Central Business District, first connecting core businesses and startups to galvanize that city’s entrepreneurial and startup communities.

- **Incremental Service Expansion: Santa Monica, California** - Santa Monica took a gradual approach to broadband service rollout. Due to demand and anticipated rising costs, local leaders put a comprehensive plan in place, and the cost of installing fiber was split among the city, the school district, and a local college. The city started by leasing the network for government use and then leased the network to businesses. Profits were used to provide Wi-Fi in public areas and ultimately to low-income communities.

Building a Playbook for Activation

Conventions, roundtables, and design sessions are vital steps in helping a community to rally stakeholders and to gather broad input about broadband implementation and access. To ensure continued engagement of stakeholders and to turn broad input into clear outcomes and goals, however, it is critical that a community identify the key players who can help shape the results of these conventions and roundtables into an actionable city playbook for broadband implementation and access.

- **The first Google Fiber city, Kansas City, pioneered the concept of a city playbook for broadband implementation, using the process of creating the playbook to galvanize community participation and identify key community focus areas, initiatives, and goals. The playbook process helped to align diverse stakeholder priorities and, importantly, to**
shift the conversation from network implementation to network activation—how the fiber network could be brought to life for the benefit of Kansas Citians.

Creating the gigabit playbook also helped Kansas City to identify the lead organization—KC Digital Drive—that would drive Kansas City’s broadband implementation and activation. KC Digital Drive understands the playbook to be a “living document” and a “work in progress” that is “likely to outlast terms of office and even lifetimes to harness the energy and capture the visions that dwell throughout the [Kansas City] community and help them become realities.” This important framing points to the reality that the community conversation about broadband access and inclusion should not stop when the first customer receives a fiber connection; rather, the conversation about helping broadband implementation live up to its promise becomes ever more important as more customers come online and the risks increase for digital divide growth and glaring connectivity gaps.

Similarly, Austin, Texas, understood the importance of beginning the activation, access, and inclusion conversation early and of continuing this conversation well beyond initial broadband implementation. Like Kansas City, Austin got ahead of the curve by building its gigabit playbook in the form of a citywide strategic plan for digital inclusion. This plan articulated Austin’s values and goals for building a digitally literate “gigabit city” and has helped to guide how the community’s broadband network has been built and implemented. This early value articulation has been key to shaping the network and to laying the groundwork for a successful system for community broadband innovation. Ongoing reporting on and tracking of the plan’s metrics ensures continued stakeholder buy-in and fidelity to community vision in implementation.

**Identify a Lead Organization**

Building a network and activating a network for benefit the community it serves are two necessarily intertwined but very different endeavors. After the network launches, it is critical to make sure that an individual or organization continues to think about how to leverage the community’s new infrastructure, how to avoid potential pitfalls of expanding digital divides, and how to engage the new “gigabit city” in the nation’s growing system for broadband innovation. In short, a new gigabit city needs a lead organization not just to drive the implementation of a broadband network but also to make sure that the realities of this new network live up to its promise and that the city continues to work toward the values and goals outlined in its gigabit playbook.

In some communities, such as Kansas City, the lead organization (Kansas City Digital Drive) has remained consistent throughout the building and activation phases of the network. However, in other cities such as Chattanooga, the lead agency has shifted as the needs of the community have changed.

Initially built and driven by EPB, the municipal utility, the Chattanooga Forward Technology, Gig, and Entrepreneurship Task Force recommended the creation of a separate organization to lead Chattanooga’s efforts to build a broadband network. Today, the Enterprise Center is charged with leading the city’s efforts to build gigabit applications, build an innovation economy, and bridge the digital divide.

It is important to ensure that the lead organization selected is stable and maintains a positive working relationship with key stakeholders. In Philadelphia, Pennsylvania, the EarthLink network was expected to solidify Philadelphia as one of the first major
Access and Inclusion in the Digital Age: A Resource Guide for Local Governments

Cities to own its own broadband network. A nonprofit organization was established to manage oversight of the provider and ensure that lower-income residents have access to the network. Due to financial troubles and operating restrictions placed on the provider, the network only existed for three years before operations ceased in 2008.

Whether it is the same organization that led the drive to get broadband, as in Kansas City, or an entirely new organization, as in Chattanooga, it is vital that there be a driving force helping the city to activate and leverage its new infrastructure.

Useful Resources

- Kansas City’s Digital Playbook: http://www.kcdigitaldrive.org/playbook/

Common Challenges and Solutions

Many of the obstacles that communities will face as they seek to expand broadband access and digital inclusion are not unique. Learning from the experiences of peers can help these communities to avoid or resolve some of the more common challenges that they may encounter.

- **Gaining support of local government leadership** – For many communities struggling with economic and public safety challenges, it may be difficult to get broadband access on the elected body’s radar, and even more difficult to establish this as a high priority. It will be important to ensure that elected officials understand the impact that broadband access can have on workforce and economic development, as well as equity and inclusiveness within a community. Making a clear connection between proposed initiatives and the highest-priority needs of the community will make it easier to gain and maintain the support of the government’s elected leadership.

- **Keeping multiple stakeholders organized and focused** – Stakeholders need to agree on and document a project plan very early in the process. Changes in direction can occur, but navigation is easier when there is agreement and documentation of the overall goals and each partner’s role.

- **Overcoming limited technical expertise** – The group that best understands the technological options is private industry. Broadband providers need to be involved in the digital inclusion initiative even though they compete with one another. Technical experts are available and can be contracted for verification of up-to-date information and options. A number of firms provide detailed technical and economic feasibility assessments. Technical assistance can also be obtained through BroadbandUSA.

- **Circumventing low trust in government** – Because of the relatively low trust toward government (at any level), it is recommended that cities allow organizations with higher levels of trust to be the public-facing side of the initiative. Local organizations to consider
include the library, public school system, faith-based institutions, or social service agencies. Local government leaders should ask themselves, “What organization(s) in our community have higher levels of trust and social capital with the target audience?”

- **Increasing levels of public participation** – While being unable to reach a target audience due to low levels of participation can be disheartening, it is important to understand the many factors that may impact participation in the programs or initiatives being offered. Some common factors include:
  - **Lack of awareness** – Participation may limited because residents are not aware of the program or initiative. It will be important to spread the word about the program and to emphasize the real-life benefits to community members.
  - **Lack of interest** – Community members may not participate in a program or initiative because they have no interest or do not see a need. Broadband and digital inclusion advocates must be careful not to impose their own priorities on community members who do not share them. A strong public engagement process at the beginning of the program will ensure that the initiatives created are aligned with the needs and interests of the community.
  - **Accessibility challenges** – Particularly with regard to digital literacy training programs, lower participation may be the result of accessibility challenges among members of the target audience. Program leaders should be mindful of potential transportation and childcare issues limiting participation. In order to address this problem, some communities are taking digital literacy programs to the residents, and offering classes and lessons right in the community. Some digital literacy programs also offer free childcare to learners.
  - **Intimidation** – Low participation may also be due to a feeling of intimidation related to technology. People who do not see themselves as having the potential to be digitally proficient may not feel like programs are intended for them. Avoiding overly technical jargon and using common language to explain the benefits and relevance of the skills being taught can help to reduce the intimidation factor and improve levels of participation. Additionally, some digital learners also lack basic reading and numeracy skills or have various disabilities. To overcome these challenges, some programs pair digital literacy and basic reading content or make arrangements to accommodate the specific disabilities of learners.
  - **Finding funding** – discussed in Chapter 5.
  - **Engaging the right partners** – discussed in Chapter 6.

**Monitoring Performance**

Tracking performance against established targets will be very important. Performance management allows stakeholders to demonstrate successes and also to learn from failures and make improvements. Not only does this result in a stronger and more successful program, but it also allows other communities to learn from
these experiences to replicate successes and avoid failures.

**Identify Measures of Performance**

- Leaders should define measures of success very early in the process. These measures will be the quantitative indicators of the changes that the program seeks to produce. Available Internet speeds and rates of adoption among community members are some of the more direct measures associated with broadband access initiatives. Much of this information is already collected by the FCC, and local communities can access this information with relative ease to track progress over time.

- Communities may also be interested in broader community measures related to specific priorities. High school graduation rates, unemployment rates, and rates of juvenile offenses within the community as a whole or in target areas are just a few possible examples.

- While many of the measures needed will be available through existing information resources, some measures may require the local government or a partnering organization to collect performance data. As an example, the city of Austin, TX, launched a digital literacy survey to understand the level of need in the community. The information collected through this process also serves as a baseline against which future progress can be measured.

**Useful Resources**

- Data compiled by the FCC in its Broadband Progress Report can be very useful for monitoring the progress of local initiatives.
  - Internet Access Service Reports: https://www.fcc.gov/reports-research/reports/internet-access-services-reports/internet-access-services-reports

- NTIA announced its Community Connectivity Initiative in 2016. This initiative will define a common framework through which different communities can assess their progress in expanding broadband access and promoting digital inclusion.
  - Community Connectivity Initiative: http://www2.ntia.doc.gov/CCI
Finding Funding

Often, one of the most difficult questions in planning for increased broadband access and digital inclusion is how the identified initiatives will be funded. The following section identifies some of the common and some of the more innovative funding strategies that communities have used to support these initiatives.

Local Funds

Some communities are able to finance improvements to broadband networks and digital inclusion programs primarily through local funds. When available, local funding is the option that provides the most control and flexibility. However, this option also requires the local government to bear all of the financial risk associated with the project or program.

General Fund Allocation

- When funding is available, communities may be able to finance certain broadband access or digital inclusion projects through allocations from the general fund. This option provides the local government with the most control, but general fund resources are often heavily burdened by competing priorities.

Municipal Bonds

- Bond financing is a common strategy used by local governments to fund large-scale infrastructure investments. Through this financing mechanism, the cost of the capital investment is amortized over a long period of time, such as 20 years.
  - General obligation bonds are backed by the taxing authority of the local government. Because property taxes are levied to repay the debt, in most cases, voters must approve issuance of general obligation bonds.
  - Revenue bonds are backed by anticipated revenues from the project being financed. Public utilities have used this financing model to provide the infrastructure improvements needed for high-speed Internet.

Special Taxing Districts

- Many communities use special taxing districts to fund investments or programs in specific areas. Tax increment financing districts and special assessment districts are two models commonly used to improve the infrastructure in certain defined areas. In both models, the cost of the investment is shared by taxpayers within the designated areas.

External Grants

Many local governments rely on external grants to support their local broadband initiatives. Various federal agencies, state agencies, and philanthropic organizations make resources available to local governments to advance their broadband and digital inclusion goals.

Federal Grants

- The National Telecommunications and Information Administration manages a
number of grant programs that support local broadband expansion.

- **NTIA Broadband Technology Opportunities Program** – The Broadband Technology Opportunities Program (BTOP) was an approximately $4 billion grant program administered by NTIA to help bridge the technological divide; create jobs; and improve education, health care, and public safety in communities across the country. Funded by the American Recovery and Reinvestment Act of 2009, BTOP projects are deploying broadband Internet infrastructure, enhancing and expanding public computer centers, and encouraging the sustainable adoption of broadband service. This program is no longer offering grants.
  
  www.ntia.doc.gov/category/broadband-technology-opportunities-program

- **NTIA State Broadband Initiative** – NTIA’s State Broadband Initiative implements the joint purposes of the Recovery Act and the Broadband Data Improvement Act, which envisioned a comprehensive program, led by state entities or nonprofit organizations working at their direction, to facilitate the integration of broadband and information technology into state and local economies. Since the program’s inception, NTIA has awarded a total of $293 million to 56 grantees.
  
  http://www2.ntia.doc.gov/SBDD

- In its report, BroadbandUSA: Guide to Federal Funding of Broadband Projects, NTIA has compiled information on other federal grant programs that can be used to support broadband expansion at the local level. This guide is an extremely valuable resource for helping local leaders to navigate the federal programs and funding opportunities that are available.

  http://www2.ntia.doc.gov/files/broadband_fed_funding_guide.pdf

- The New Markets Tax Credit (NMTC) Program attracts private capital into low-income communities by permitting individual and corporate investors to receive a tax credit against their federal income tax in exchange for making equity investments in specialized financial intermediaries called Community Development Entities. The NMTC Program can be used for investments in broadband.

  https://www.cdfifund.gov/programs-training/Programs/new-markets-tax-credit/Pages/default.aspx

### State Grants

A number of states have broadband expansion programs through which local governments can receive grant funding.

- **Connect NY Broadband Program** – Connect NY is a program administered by New York State’s Broadband Program Office. The program provides grant funding to support various broadband projects, using an auction format.

  http://nysband.ny.gov/ConnectNY2012

- **ConnectME Authority** - The ConnectME Authority is a component unit of Maine state government whose mission is to facilitate the universal availability of broadband to all Mainers and help them understand the valuable role it can play in enriching their lives and helping their communities and businesses thrive. ConnectME supports local efforts through infrastructure grants and community broadband planning grants.

  http://www.maine.gov/connectme/about/index.shtml
Access and Inclusion in the Digital Age:
A Resource Guide for Local Governments

Finding Funding

Wisconsin State Broadband Office: LinkWISCONSIN Initiative – Since 2009, the initiative has been collecting and mapping broadband coverage information for improved planning purposes. As part of the Public Service Commission of Wisconsin (Commission), the State Broadband Office (SBO) works with stakeholders to build partnerships with providers and consumers to enhance broadband across the state. The SBO also administers broadband improvement funding through the annual Broadband Expansion Grant Program. http://www.link.wisconsin.gov/

Many other states have similar broadband funding programs.

Foundation Grants
National and local foundations have also been active supporters of broadband expansion initiatives.

The Blandin Foundation - Since making rural broadband use and access a focus in 2003, Blandin Foundation has partnered with leaders in nearly 70 communities and 110 organizations across the state. Two objectives are core to the hundreds of projects that have emerged from this work: sustainable broadband adoption and enriched quality of life and place. Through the Blandin Community Broadband Program, the foundation extends its focus through 2016 with up to $1.5 million in grants and technical support available to rural Minnesota communities. http://broadband.blandinfoundation.org/

Partnerships
Through creative partnerships, local governments can leverage financial resources of other interested parties from both the public and private sectors. This option requires coordination and compromise among parties, but allows the local government to share some of the financial risk associated with the project or program.

Intergovernmental Collaboration
Many communities finance broadband expansion projects through local or regional collaboration between governments or other public organizations.

In 2016, the city of San Jose, California, is partnering with the East Side Union High School District to launch a free Wi-Fi network for families in the school district. In the partnership, the city will construct the network and manage installation and ongoing maintenance, while the school district will manage registration, passcodes, and support for students and families in accessing the network. The pilot program is funded by a $2.7 million allocation from the school district’s general obligation technology bond measure.

In 2012, Arlington County, Virginia collaborated with Arlington public schools to create a high-speed network to serve the government as well as the public school community. The network was later expanded to include federal agencies and universities.

Public-Private Partnerships
P3s represent another model for local governments to leverage external resources and share risk. In this model, the government partners with a private entity to complete the project or implement the program. These arrangements typically specify the costs and
benefits that will accrue to each party at the outset of the engagement.

- Scott County, Minnesota, used a P3 approach to develop a 90-mile fiber network. The county provided the upfront deployment costs and owns the fiber network, but partners with three private network providers to maintain and manage the network. The private providers maintain the network at no cost to the county in exchange for the ability to include their own fiber strands in the buried conduit.

- NTIA’s report, BroadbandUSA: An introduction to effective public-private partnerships for broadband investments, is a valuable resource for local governments interested in this approach. 

**Fundraising**

To amass the funding for an initiative, whether community-wide or a pilot project, local leaders will be required to present a compelling explanation of the need and assurance that a reasonable, achievable plan can and will be implemented.

**Fundraising Resources**

- Broadband Communities: Show Me the Money

- Community Broadband Snapshot Report: Show Me the (Hidden) Money for Community Broadband
6 Engaging Partners

Collaboration is a key to success for expanding broadband access for most communities. While there are exceptions to this rule, communities that foster relationships with other organizations are more likely to succeed with large-scale broadband expansion than those that try to tackle it all on their own.

Federal Agencies and Programs

A number of federal agencies are spearheading broadband initiatives across the United States. The FCC has outlined a National Broadband Plan and issues an annual report that outlines how the United States’ broadband expansion efforts are impacting communities. NTIA has offered opportunities for broadband grant funding, and the United States Department of Agriculture’s (USDA’s) Rural Utilities Service is working to expand broadband access to rural residents. These agencies and others are able to provide information and assistance to local government in support of broadband expansion and can serve as very valuable partners.

- **National Broadband Plan** – The National Broadband Plan, released by the FCC on March 17, 2010, sets out a roadmap for initiatives to stimulate economic growth, spur job creation, and boost America’s capabilities in education, health care, homeland security, and more. The plan includes sections focusing on economic opportunity, education, health care, energy and the environment, government performance, civic engagement, and public safety.
  https://www.fcc.gov/general/national-broadband-plan

- **Measuring Broadband America** – The Measuring Broadband America program is an ongoing nationwide performance study of broadband service in the United States that developed out of a recommendation by the National Broadband Plan to improve the availability of information for consumers about their broadband service.
  https://www.fcc.gov/general/measuring-broadband-america

- **National Broadband Map** – The National Broadband Map website provides maps and data to analyze availability of broadband services across the United States.
  http://broadbandmap.gov/

- **National Telecommunications and Information Administration** – NTIA is the executive branch agency that is principally responsible for advising the President on telecommunications and information policy issues. NTIA’s programs and policymaking focus largely on expanding broadband Internet access and adoption in America, expanding the use of spectrum by all users, and ensuring that the Internet remains an engine for continued innovation and economic growth.
  https://www.ntia.doc.gov/

- **NTIA BroadbandUSA** – NTIA developed BroadbandUSA to provide assistance to communities that want to expand their broadband capacity and promote broadband adoption. BroadbandUSA brings stakeholders together to solve problems, contribute to emerging policies, link communities to other
federal agencies and funding sources, and address barriers to collaboration across agencies.

http://www2.ntia.doc.gov

- **USDA Rural Development - Rural Utilities Service** - USDA's Rural Utilities Service administers programs that provide much-needed infrastructure or infrastructure improvements to rural communities. These include water and waste treatment, electric power, and telecommunications services. All of these services play a critical role in helping to expand economic opportunities and improve the quality of life for rural residents.

http://www.rd.usda.gov/about-rd/agencies/rural-utilities-service

- **ConnectHome** - ConnectHome is a public-private collaboration to narrow the digital divide for families with school-age children who live in HUD-assisted housing. ConnectHome is one step in the federal government's continued efforts to bring affordable broadband access, technical training, digital literacy programs, and electronic devices to all Americans.

http://connecthome.hud.gov

- **Strong Cities, Strong Communities Initiative (SC2)** - The Strong Cities, Strong Communities Initiative pilot program began in July 2011. The SC2 concept was developed through engagement with mayors, members of Congress, foundations, nonprofits, and other community partners who are committed to addressing the challenges of local governments. SC2 and its partners are working together to coordinate federal programs and investments to spark economic growth in distressed areas and create stronger cooperation among community organizations, local leadership, and the federal government.

https://www.huduser.gov/portal/sc2/home.html

**Nongovernmental Organizations**

A number of national and international nongovernmental organizations are also highly active in promoting expanded broadband access and digitally inclusive communities.

- **International City/County Management Association (ICMA)** – ICMA identifies leading practices to address the needs of local governments and professionals serving communities globally. ICMA provides services, research, publications, data and information, peer and results-oriented assistance, and training and professional development to thousands of city, town, and county leaders and other individuals and organizations throughout the world. The management decisions made by ICMA's members affect millions of people living in thousands of communities, ranging in size from small towns to large metropolitan areas.

http://icma.org

- **National Association of Telecommunications Officers and Advisors (NATOA)** – NATOA is the premier local government professional association that provides support to members on the many local, state, and federal communications laws, administrative rulings, judicial decisions, and technology issues impacting the interests of local governments. Founded in 1980, the association offers a range of advocacy services to individual and agency members representing cities, towns, counties, and commissions across the country. NATOA actively analyzes and addresses emerging issues in areas such as:
- Local government communications and Internet policy
- Broadband planning best practices
- Cable franchising
- Operation of public, education, and government access channels
- Wireless zoning
- New technology initiatives and advancements

https://www.natoa.org/web/

- **National Digital Inclusion Alliance** – The National Digital Inclusion Alliance is a unified voice for local technology training, home broadband access, and public broadband access programs. The alliance works collaboratively to craft, identify, and disseminate financial and operational resources for digital inclusion programs while serving as a bridge to policy makers and the general public.
  http://www.digitalinclusionalliance.org/

- **National Association of Counties (NACo)** – NACo unites America’s 3,069 county governments. Founded in 1935, NACo brings county officials together to advocate with a collective voice on national policy, exchange ideas and build new leadership skills, pursue transformational county solutions, enrich the public’s understanding of county government, and exercise exemplary leadership in public service.
  http://www.naco.org/

- **National League of Cities (NLC)** – NLC is dedicated to helping city leaders build better communities. Working in partnership with the 49 state municipal leagues, NLC serves as a resource to and an advocate for the more than 19,000 cities, villages, and towns it represents.
  http://www.nlc.org/

- **Next Century Cities** - Across the country, innovative municipalities are already recognizing the importance of leveraging gigabit-level Internet to attract new businesses and create jobs, improve health care and education, and connect residents to new opportunities. Next Century Cities is committed to celebrating these successes, demonstrating their value, and helping other cities to realize the full power of truly high-speed, affordable, and accessible broadband.
  http://nextcenturycities.org/

- **EveryoneOn** - EveryoneOn is a national nonprofit working to eliminate the digital divide by making high-speed, low-cost Internet service and computers, and free digital literacy courses, accessible to all unconnected Americans. The program provides options for low-cost Internet access, deals on purchasing computers, and educational opportunities based on ZIP code and eligibility for free/reduced-cost lunch programs.
  http://everyoneon.org/

- **NTCA – The Rural Broadband Association** – NTCA is the premier association representing nearly 900 independent, community-based telecommunications companies that are leading innovation in rural and small-town America. NTCA advocates on behalf of its members in the legislative and regulatory arenas, and it provides training and development, publications and industry events, and an array of employee benefit programs. In an era of exploding technology, deregulation, and marketplace competition, NTCA’s members are leading the Internet Protocol (IP) evolution for rural consumers, delivering technologies that make rural communities vibrant places in which to live and do business. Because of their efforts, rural America is fertile ground for innovation in economic development and commerce, education, health care, government services, security, and smart energy use.
  http://www.ntca.org/
Schools, Health & Libraries Broadband (SHLB) Coalition - “Connecting Anchor Institutions: A Broadband Action Plan” was developed by the SHLB Coalition to provide ideas and actionable policy recommendations for government leaders at the federal, state, and local levels to address the broadband needs of anchor institutions. The ten policy papers highlight connectivity gaps and explain why broadband access is vital to communities nationwide. 
http://www.shlb.org/

US Ignite - US Ignite fosters the creation of next-generation Internet applications that provide transformative public benefit. 
https://www.us-ignite.org/

Connected Nation - Connected Nation facilitates P3s to increase access to and use of broadband and related technology, creating dramatic results that translate into economic and community development, better education, higher-quality healthcare, more efficient public service, and improved quality of life. Connected Nation aspires to be recognized as an international market leader among organizations that work in the trenches to bridge the digital divide and increase opportunities that are enabled when people have the ability and desire to connect. 
http://connectednation.org

State Agencies and Programs

States are also playing a role in broadband expansion. Wisconsin has created a State Broadband Office. Colorado, Texas, Missouri, Maine, and others also have efforts underway to expand broadband and provide positive economic benefits through a variety of programs, grants, and incentives. Most, if not all, states have some kind of broadband expansion initiative, including funding/partnering options for underserved areas. Examples include the following.

Public Service Commission (PSC) of Wisconsin - State Broadband Office - An app displaying statewide Internet access as declared by ISPs through the biannual data collections by the PSC and FCC. The app allows users to search by address and identify their local providers by simply clicking on the map. The PSC's map layer for
Broadband Expansion Grant eligibility is also displayed here.
http://www.link.wisconsin.gov/broadband-maps

- Colorado Department of Local Affairs - Broadband Program - The Colorado Department of Local Affairs supports the efforts of local governments to improve broadband service to their constituents to achieve enhanced community and economic development. The initiative:
  - Promotes interjurisdictional communication
  - Supports better access to services available over broadband, such as distance learning opportunities and telemedicine
  - Provides planning and “middle mile” infrastructure grants
https://www.colorado.gov/pacific/dola/broadband-program

- Missouri Broadband Now – Governor Nixon created MoBroadbandNow as a public-private initiative of multiple cooperative partners to expand and enhance broadband accessibility and adoption to all areas of the state.
http://mobroadbandnow.com/

- Connected Texas – Connected Texas is an independent, public-private initiative working to ensure that all can experience the benefits of broadband, with the understanding that technology, especially widespread access, use, and adoption of broadband, improves all areas of life.
http://www.connectedtx.org/

- ConnectME Authority – The ConnectME Authority is a component unit of Maine state government whose mission is to facilitate the universal availability of broadband to all Mainers and help them understand the valuable role it can play in enriching their lives and helping their communities and businesses thrive.
http://www.maine.gov/connectme/

- Connect Ohio – Connect Ohio is working to bring the benefits of universal broadband to Ohio. Connect Ohio works together with the State of Ohio to advance broadband issues in communities across the state.
http://www.connectohio.org

- Connecticut State Broadband Initiative – The Connecticut State Broadband Office was created in 2015 to explore options for more communities to gain access to broadband Internet services.
http://www.ct.gov/broadband/site/default.asp

Private Sector

- Google Fiber – Google Fiber provides 1 Gbps Internet services to a small and growing number of U.S. cities. The company works closely with each city to map out and understand all possible local needs and challenges. The Kansas City metropolitan area was the first to receive Google Fiber service.
http://fiber.google.com/about/

- Comcast Internet Essentials Program – Internet Essentials is a program that seeks to remove barriers to digital inclusion. Internet Essentials is designed to be a wraparound solution to directly address every barrier to adoption by providing affordable Internet, subsidized computers, and free digital
literacy training to eligible low-income families.

https://Internetessentials.com/about

- **Connect2Compete** – Cox’s Connect2Compete program serves qualifying families with school-age children (in kindergarten through twelfth grade) who receive free or reduced-price school lunch through the National School Lunch Program, Temporary Assistance for Needy Families, or the Supplemental Nutrition Assistance Program. In addition, Cox has partnered with HUD to support its ConnectHome initiative.

- **Access by AT&T** – Access by AT&T offers low-cost Internet service to eligible low-income families.

https://www.att.com/shop/internet/access/

### Local Partners

Local leaders should consider engaging the following local partners depending on the community, leadership, and willingness to get involved with each.

- **Local governments and other public entities** – Local leaders should consider collaboration with other municipal or county governments. Many jurisdictions have had success in engaging with local utilities, public school districts, housing authorities, or public library systems to advance broadband and digital literacy goals.

- **Local anchor institutions** – Anchor institutions can be excellent local partners. Private universities, community colleges, hospital systems, and other local institutions are important stakeholders in any initiative to expand broadband access or improve digital literacy. These organizations can also be a valuable source of information resources or financial support.

- **The local business community** – Understanding the impact that greater broadband access can have on economic growth and competitiveness, local businesses can be a great partner for local broadband and digital inclusion initiatives. In many communities, the local tech and start-up communities have been particularly active. Communities can also engage with their local chambers of commerce and other business interest groups.

- **Local Internet service providers** – The group that best understands the technological options is private industry. Broadband providers can be strong partners for many local programs. Many communities have had success in deploying private solutions to increase broadband access in targeted areas. Also, technical experts from private companies are often available and can be contracted for verification of up-to-date information and options.
7 Closing

Understanding the significant impact that broadband Internet has on individuals, families, and communities, it is increasingly important for local government leaders to take an active role in moving their jurisdictions toward greater broadband access and digital inclusion. This resource guide, developed through the collaborative efforts of six cities, adds to a growing body of knowledge on strategies and resources for improving local broadband access. From the subjects of program development to legislative issues, and funding strategies to public engagement, this resource guide is built on the belief that there is great value in sharing information and learning from the experiences of peer communities. As such, the guide aims to facilitate ongoing communication among the contributing cities as well as other communities interested in these initiatives. Continued collaboration and communication will be critical as stakeholders work to close the digital divide in the United States.
## Acronyms

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<th>Acronym</th>
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<td>BPL</td>
<td>Broadband over Power Lines</td>
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<td>Broadband Technology Opportunities Program</td>
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<td>DSL</td>
<td>Digital Subscriber Line</td>
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<td>FCC</td>
<td>Federal Communications Commission</td>
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<td>FTTP</td>
<td>Fiber to the Premise</td>
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<td>HUD</td>
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<td>ICMA</td>
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<td>ISP</td>
<td>Internet service provider</td>
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<td>LTE</td>
<td>Long Term Evolution</td>
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<td>NACo</td>
<td>National Association of Counties</td>
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<td>NARC</td>
<td>National Association of Regional Councils</td>
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<td>NATOA</td>
<td>National Association of Telecommunications Officers and Advisors</td>
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<td>NCSL</td>
<td>National Conference of State Legislatures</td>
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<td>NMTC</td>
<td>New Markets Tax Credit</td>
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<td>National Resource Network</td>
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<td>NTCA</td>
<td>The Rural Broadband Association (formerly the National Telephone Cooperative Association)</td>
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<td>NTIA</td>
<td>National Telecommunications and Information Administration</td>
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<td>P3</td>
<td>Public-private partnership</td>
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<td>PSC</td>
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<td>SC2</td>
<td>Strong Cities, Strong Communities Initiative</td>
</tr>
<tr>
<td>SHLB</td>
<td>Schools, Health &amp; Libraries Broadband</td>
</tr>
<tr>
<td>USDA</td>
<td>United States Department of Agriculture</td>
</tr>
<tr>
<td>WiMAX</td>
<td>Worldwide Interoperability for Microwave Access</td>
</tr>
</tbody>
</table>
### National and Global Statistics on Broadband Access and Digital Inclusion

#### 2014 Speed Leaders—Home Broadband

<table>
<thead>
<tr>
<th>Rank</th>
<th>City</th>
<th>ISP</th>
<th>Download Speed</th>
<th>Upload Speed</th>
<th>Price (USD/PPP)</th>
<th>Data Cap (GB)</th>
<th>Network Technology</th>
<th>Bundled?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1(t)</td>
<td>Seoul</td>
<td>HelloVision</td>
<td>1000</td>
<td>1000</td>
<td>$30.30</td>
<td>N/A</td>
<td>Fiber</td>
<td>No</td>
</tr>
<tr>
<td>1(t)</td>
<td>Hong Kong</td>
<td>Hong Kong Broadband Network Limited</td>
<td>1000</td>
<td>1000</td>
<td>$37.41</td>
<td>N/A</td>
<td>Fiber</td>
<td>No</td>
</tr>
<tr>
<td>1(t)</td>
<td>Tokyo</td>
<td>KDDI</td>
<td>1000</td>
<td>1000</td>
<td>$39.15</td>
<td>N/A</td>
<td>Fiber</td>
<td>No</td>
</tr>
<tr>
<td>1(t)</td>
<td>Chattanooga</td>
<td>EPB</td>
<td>1000</td>
<td>1000</td>
<td>$69.99</td>
<td>N/A</td>
<td>Fiber</td>
<td>No</td>
</tr>
<tr>
<td>1(t)</td>
<td>Kansas City, MO</td>
<td>Google Fiber</td>
<td>1000</td>
<td>1000</td>
<td>$70.00</td>
<td>N/A</td>
<td>Fiber</td>
<td>No</td>
</tr>
<tr>
<td>1(t)</td>
<td>Kansas City, KS</td>
<td>Google Fiber</td>
<td>1000</td>
<td>1000</td>
<td>$70.00</td>
<td>N/A</td>
<td>Fiber</td>
<td>No</td>
</tr>
<tr>
<td>1(t)</td>
<td>Lafayette</td>
<td>LUS</td>
<td>1000</td>
<td>1000</td>
<td>$109.95</td>
<td>N/A</td>
<td>Fiber</td>
<td>No</td>
</tr>
<tr>
<td>8</td>
<td>Zürich</td>
<td>Swisscom</td>
<td>1000</td>
<td>1000</td>
<td>$157.55</td>
<td>N/A</td>
<td>Fiber</td>
<td>Yes</td>
</tr>
<tr>
<td>9</td>
<td>Bristo</td>
<td>IBVU</td>
<td>1000</td>
<td>50</td>
<td>$319.95</td>
<td>N/A</td>
<td>Fiber</td>
<td>No</td>
</tr>
<tr>
<td>10</td>
<td>Bucharest</td>
<td>RCS &amp; RDS</td>
<td>1000</td>
<td>30</td>
<td>$32.35</td>
<td>N/A</td>
<td>Fiber</td>
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<tr>
<td>11</td>
<td>Paris</td>
<td>Free</td>
<td>1000</td>
<td></td>
<td>$35.28</td>
<td>N/A</td>
<td>Fiber</td>
<td>Yes</td>
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<tr>
<td>12(t)</td>
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<td>XS4ALL</td>
<td>500</td>
<td>500</td>
<td>$72.29</td>
<td>N/A</td>
<td>Fiber</td>
<td>No</td>
</tr>
<tr>
<td>12(t)</td>
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<td>SEAS-NVE</td>
<td>500</td>
<td>500</td>
<td>$129.24</td>
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<td>Yes</td>
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<tr>
<td>12(t)</td>
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<td>Baltcom</td>
<td>500</td>
<td>500</td>
<td>$142.29</td>
<td>N/A</td>
<td>Fiber</td>
<td>No</td>
</tr>
<tr>
<td>12(t)</td>
<td>Los Angeles</td>
<td>Verizon</td>
<td>500</td>
<td>500</td>
<td>$299.99</td>
<td>N/A</td>
<td>Fiber</td>
<td>No</td>
</tr>
<tr>
<td>12(t)</td>
<td>New York</td>
<td>Verizon</td>
<td>500</td>
<td>500</td>
<td>$299.99</td>
<td>N/A</td>
<td>Fiber</td>
<td>No</td>
</tr>
<tr>
<td>12(t)</td>
<td>Washington, DC</td>
<td>Verizon</td>
<td>500</td>
<td>500</td>
<td>$299.99</td>
<td>N/A</td>
<td>Fiber</td>
<td>No</td>
</tr>
<tr>
<td>18</td>
<td>Toronto</td>
<td>Rogers</td>
<td>350</td>
<td>350</td>
<td>$182.25</td>
<td>2000</td>
<td>Fiber</td>
<td>No</td>
</tr>
<tr>
<td>19</td>
<td>Prague</td>
<td>UPC</td>
<td>240</td>
<td>20</td>
<td>$83.63</td>
<td>N/A</td>
<td>Fiber</td>
<td>No</td>
</tr>
<tr>
<td>20(t)</td>
<td>San Francisco</td>
<td>Webpass</td>
<td>200</td>
<td>200</td>
<td>$30.00</td>
<td>N/A</td>
<td>Fiber</td>
<td>No</td>
</tr>
<tr>
<td>20(t)</td>
<td>Mexico City</td>
<td>Axtel</td>
<td>200</td>
<td>200</td>
<td>$156.32</td>
<td>N/A</td>
<td>Fiber</td>
<td>Yes</td>
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<tr>
<td>22</td>
<td>Berlin</td>
<td>Deutsche Telekom</td>
<td>200</td>
<td>100</td>
<td>$57.63</td>
<td>N/A</td>
<td>Fiber</td>
<td>Yes</td>
</tr>
<tr>
<td>23</td>
<td>Dublin</td>
<td>UPC</td>
<td>200</td>
<td>10</td>
<td>$63.41</td>
<td>N/A</td>
<td>Cable</td>
<td>Yes</td>
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<tr>
<td>24</td>
<td>London</td>
<td>Virgin</td>
<td>152</td>
<td></td>
<td>$55.71</td>
<td>N/A</td>
<td>Fiber</td>
<td>No</td>
</tr>
</tbody>
</table>

Source: Open Technology Institute: [https://data.opentechinstitute.org/dataset/54bf4230-305c-4ee9-ac36-fa301e1397bc/resource/55673f60-95df-4795-9c80-1a66e81e7f05/](https://data.opentechinstitute.org/dataset/54bf4230-305c-4ee9-ac36-fa301e1397bc/resource/55673f60-95df-4795-9c80-1a66e81e7f05/)
Cost of Internet—Various Cities

Estimated monthly cost for 25 mbps, the speed at which a YouTube video loads in 1.3 seconds and a 2-hour movie in 13.3 minutes

Source: Open Technology Institute, New America Foundation
Internet Connection Speeds

Average peak speed in megabits per second for the fourth quarter of 2014.
Akamai Technologies

www.washingtonpost.com/blogs/govbeat
### Monthly Internet (10 mbps, unlimited data, cable/DSL) Costs
#### Sample of Small and Mid-sized US Cities

<table>
<thead>
<tr>
<th>City</th>
<th>Average Cost</th>
<th>Range of Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albuquerque, NM</td>
<td>$48.09</td>
<td>$30.00 to $60.00</td>
</tr>
<tr>
<td>Allentown, PA</td>
<td>$57.00</td>
<td>$30.00 to $70.00</td>
</tr>
<tr>
<td>Anaheim, CA</td>
<td>$51.66</td>
<td>$39.95 to $65.00</td>
</tr>
<tr>
<td>Bismarck, ND</td>
<td>$52.50</td>
<td>$44.95 to $70.00</td>
</tr>
<tr>
<td>Boise, ID</td>
<td>$48.29</td>
<td>$35.00 to $60.00</td>
</tr>
<tr>
<td>Chattanooga, TN</td>
<td>$57.33</td>
<td>$40.00 to $79.00</td>
</tr>
<tr>
<td>Eugene, OR</td>
<td>$48.22</td>
<td>$39.99 to $65.00</td>
</tr>
<tr>
<td>Greensboro, NC</td>
<td>$49.38</td>
<td>$40.00 to $65.00</td>
</tr>
<tr>
<td>Kansas City, MO</td>
<td>$46.91</td>
<td>$35.00 to $70.00</td>
</tr>
<tr>
<td>New Orleans, LA</td>
<td>$67.05</td>
<td>$45.00 to $100.00</td>
</tr>
<tr>
<td>Portland, ME</td>
<td>$44.82</td>
<td>$35.00 to $60.00</td>
</tr>
<tr>
<td>Springfield, MO</td>
<td>$41.28</td>
<td>$30.00 to $50.00</td>
</tr>
<tr>
<td>Youngstown, OH</td>
<td>$50.00</td>
<td>$45.00 to $70.00</td>
</tr>
</tbody>
</table>

*Source: NUMBEO Cost of Living Calculator—*

Percentage of Households by Type of Internet Subscription—2013

(Data based on sample. For information on confidentiality protection, sampling error, nonsampling error, and definitions, see www.census.gov/acs/www/)

Note: Households were able to select multiple types of Internet service. For breakdowns that limit household subscriptions to only one response category, please see Table B28002 in American Factfinder at http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml.

The estimate of mobile broadband subscriptions may be low due to a variety of methodological factors, including question order, question wording, and related data collection issues. The Census Bureau is working to improve the measurement in future surveys.

Source: U.S. Census Bureau. 2013 American Community Survey.
Computer Ownership and High Speed Internet Use for Individuals by State—2013

Source: U.S. Census Bureau, 2013 American Community Survey.
Computer Ownership for Individuals by Metropolitan Statistical Area—2013

Note: Metropolitan Statistical Areas defined by the Office of Management and Budget as of February 2013.
Source: U.S. Census Bureau, 2013 American Community Survey.
High Speed Internet Use for Individuals by Metropolitan Statistical Area—2013

Note: Metropolitan Statistical Areas defined by the Office of Management and Budget as of February 2013.
Source: U.S. Census Bureau, 2013 American Community Survey.
Internet Adoption in the US by County—2013