

Broadband Strategic Planning Briefing Book For Workgroup Appointees

Introduction

Project Objectives:

- To build community-wide collaboration and cooperation toward improved access to broadband solutions, improve and focus economic and community development strategies using broadband as a tool and establish Kentucky as a center of innovation for broadband adoption and utilization.
- To facilitate and support the development of community broadband strategic plans in two communities around the state that aim to advance community goals through increased broadband adoption and utilization of broadband-enabled applications.

This briefing book is intended to provide plan participants with the background necessary to deliberate on policies, actions and directions that your community can take to positively impact the adoption and utilization of services to citizens in the future. The briefing book is compiled using excerpts from the 2010 Federal Communications Commission's National Broadband Plan (NBP)¹, as well as the following sources:

- Broadband KY e-Solutions Benchmarking Technical Report²
- FCC Bringing Broadband to Rural America: Update to Report on a Rural Broadband strategy³
- FirstNet in Kentucky – Kentucky Work Plan
<https://www.kyfirstnet.com/Pages/Kentucky-Work-Plan.aspx>
- Community Fiber Networks - Feasibility Studies
- Google Wired Cities documents
- IBM's Smarter Cities⁵
- Kentucky Broadband Data Mapping Website⁶

¹ www.broadband.gov/plan/

² [http://finance.ky.gov/initiatives/Broadband/Documents/e-Solutions%20Benchmarking%20Technical%20Report%20\(May%202012\).pdf](http://finance.ky.gov/initiatives/Broadband/Documents/e-Solutions%20Benchmarking%20Technical%20Report%20(May%202012).pdf)

³ <https://www.fcc.gov/document/bringing-broadband-rural-america>

⁵ http://www.ibm.com/smarterplanet/us/en/smarter_cities/overview/

- FCC Broadband in Rural Areas⁷
- Kentucky Health Information Exchange (KHIE)⁸

The first sections of this briefing book excerpt relevant information from Chapters 1-4 of the NBP, FCC Report on the Development of Rural Broadband and from Survey Results. The following sections of this briefing book will provide specific research from both the NBP and other documents that are specific to each workgroup. Sections are prepared for:

- Economic Development
- Planning/Sustainability and Transportation
- Citizen Involvement
- Public Safety
- Health and Education

Overview of Broadband

Persuasive research indicates that connecting our communities and region to broadband will bring economic, social, cultural, personal, and other benefits to our citizens. Communities now have to compete globally as well as regionally for jobs and clean industry. Quality of life is linked not only to natural beauty, great education and opportunities, good housing, but also to access to the digital infrastructure that makes all of these elements possible and sustainable.

Excerpted from the National Broadband Plan Chapter 1

Infrastructure networks unite us as a country, bringing together parents and children, buyers and sellers, and citizens and government in ways once unimaginable. Ubiquitous access to infrastructure networks has continually driven American innovation, progress, prosperity and global leadership. Communications infrastructure plays an integral role in this American story. In the 1920s, '30s, '40s and '50s, telephony, radio and television transformed America, unleashing new opportunities for American innovators to create products and industries, new ways for citizens to engage their elected officials and a new foundation for job growth and international competitiveness. Private investment was pivotal in building most of these networks, but government actions also played an important role. Treasury bonds and land grants underwrote the railroad, the Rural Electrification Act brought electricity to farms and the federal government funded 90% of the cost of the interstate highways. In communications, the government stimulated the construction of radio and television facilities across the country by offering huge tracts of the public's airwaves free of charge. It did the same with telephony through a Universal Service Fund, fulfilling the vision of the Communications Act of 1934 "to make available, so far as possible, to all the people of the United States, a rapid, efficient, Nation-wide, and world-wide wire and radio communication service with adequate facilities at reasonable charges."

Today, high-speed Internet is transforming the landscape of America more rapidly and more pervasively than earlier infrastructure networks. Like railroads and highways, broadband accelerates the velocity of commerce, reducing the costs of distance. Like electricity, it creates a platform for America's creativity to lead in developing better ways to solve old problems. Like telephony and broadcasting, it expands our ability to com-

⁶ www.broadband.ky.gov

⁷ http://www.broadband.gov/rural_areas.html

⁸ <http://khie.ky.gov/Pages/index.aspx>

municate, inform and entertain. Broadband is the great infrastructure challenge of the early 21st century. But as with electricity and telephony, ubiquitous connections are means, not ends. It is what those connections enable that matters. Yet there are still critical problems that slow the progress of availability, adoption and utilization of broadband. Recognizing this, one year ago Congress echoed the Communications Act of 1934 and directed the FCC to develop a National Broadband Plan ensuring that every American has "access to broadband capability." Specifically, the statute dictates: "The national broadband plan required by this section shall seek to ensure that all people of the United States have access to broadband capability and shall establish benchmarks for meeting that goal. The plan shall also include:

- an analysis of the most effective and efficient mechanisms for ensuring broadband access by all people of the United States,
- a detailed strategy for achieving affordability of such service and maximum utilization of broadband infrastructure and service by the public,
- an evaluation of the status of deployment of broadband service, including progress of projects supported by the grants made pursuant to this section, and
- a plan for use of broadband infrastructure and services in advancing consumer welfare, civic participation, public safety and homeland security, community development, health care delivery, energy independence and efficiency, education, worker training, private sector investment, entrepreneurial activity, job creation and economic growth, and other national purposes."

Nearly 100 million Americans do not have broadband today. Fourteen million Americans do not have access to broadband infrastructure that can support today's and tomorrow's applications. More than 10 million school-age children do not have home access to this primary research tool used by most students for homework. Jobs increasingly require Internet skills; the share of Americans using high-speed Internet at work grew by 50% between 2003 and 2007, and the number of jobs in information and communications technology is growing 50% faster than in other sectors. Yet millions of Americans lack the skills necessary to use the Internet. What's more, there are significant gaps in the utilization of broadband for other national priorities.

In nearly every metric used to measure the adoption of health information technology (IT), the United States ranks in the bottom half among comparable countries, yet electronic health records could alone save more than \$500 billion over 15 years. Much of the electric grid is not connected to broadband, even though a Smart Grid could prevent 360 million metric tons of carbon emissions per year by 2030, equivalent to taking 65 million of today's cars off the road. Online courses can dramatically reduce the time required to learn a subject while greatly increasing course completion rates, yet only 16% of public community colleges—which have seen a surge in enrollment—have high-speed connections comparable to our research universities. Nearly a decade after 9/11, our first responders still require access to better communications.

Unless we reform our approach to these gaps, we will fail to seize the opportunity to improve our nation, and we will fall behind those countries that do. In fact, other countries already have adopted plans to address these gaps. The ways that other countries have confronted this challenge help inform how we might approach the problem. But each country's experiences and challenges have critical differences. Our solutions must reflect the unique economic, institutional and demographic conditions of our country.

The United States is distinct in many ways. For example, many countries have a single, dominant nationwide fixed telecommunications provider; the United States has numerous providers. Cable companies play a more prominent role in our broadband system than in other countries. The U.S. is less densely populated than other countries. Unlike most other countries, we regulate at both the state and federal

What local outdated policies could be revised to encourage the use of broadband related technologies?

levels. Our plan should learn from international experiences, but must also take into account the distinguishing realities of broadband in the United States. Our plan must be candid about where current government policies hinder innovation and investment in broadband. Government influences critical inputs needed to build broadband networks— such as spectrum, universal service funds and rights-of-way—yet all are structured to serve the priorities of the past, not the opportunities of the future. In addition, current government policies maintain incentives for our schools, hospitals and other public interest institutions to use outdated technologies and practices, disadvantaging our people and hindering our economy. Just as this plan should build on the distinctive attributes of the American market, it should also correct the problematic policies found here.

Above all, an American plan should build on American strengths. The first of these strengths is innovation. The United States maintains the greatest tradition of innovation and entrepreneurship in the world—one that combines creativity with engineering to produce world-leading applications, devices and content, as well as the businesses that bring them to market. Our national plan must build on this strength to ensure that the next great companies, technologies and applications are developed in the United States. U.S. leadership in these spheres will advance our most important public purposes. A healthy environment for innovation will enable advances in health care, energy, education, job training, public safety and all of our national priorities. Creativity is a national virtue that has catalyzed American leadership in many sectors. America's plan should unlock that creativity to transform the public sector, too. We have just begun to benefit from the ways broadband unleashes innovations to improve American lives. a job seeker in South Bend telecommuting for a company in the Deep South; a medical specialist in Chapel Hill providing medical consultations to a patient in the Hill Country; grandparents in Cleveland video-chatting with their grandchildren in Colorado Springs; firefighters downloading blueprints of a burning building. The applications that broadband enables provide innovative, efficient solutions to challenges Americans confront every day.



How can your community help create such "world-leading" applications?

Many international broadband plans emphasize speeds and networks, focusing only on technical capacity as a measure of a successful broadband system. Our plan must go beyond that. While striving for ubiquitous and fast networks, we must also strive to use those networks more efficiently and effectively than any other country. We should lead the world where it counts—in the use of the Internet and **in the development of new applications that provide the tools that each person needs to make the most of his or her own life. The United States is well positioned to lead in creating those applications.** We have leading health research centers; we should also lead the world in effective health care applications. We have leading educational institutions; we should also lead the world in effective educational applications. We should seize this opportunity to lead the world in applications that serve public purposes. The second great American strength is inclusion. As a country, we believe that to march ahead we don't need to leave anyone behind. We believe that all deserve the opportunity to improve their lives. We believe that where you start shouldn't dictate where you finish, that demography isn't destiny, that privilege isn't a necessary prologue to success. This ideal doesn't just compel us to rebuke discrimination; it compels us to be proactive. It inspires us to live up to an obligation we have to each other—to ensure that everyone has an opportunity to succeed. This desire for equal opportunity has long guided our efforts to make access to technologies universal, from electricity to telephony, from television to radio. Today, as technology continues to change the way the world interacts, to be on the outside is to live in a separate, analog world, disconnected from the vast opportunities broadband enables. While broadband adoption has grown steadily, it is still far from universal. It lags considerably among certain demographic groups, including the poor, the elderly, and some racial and ethnic minorities, those who live in rural areas and those with disabilities. Many of these Americans already struggle to succeed. Unemployment rates are high, services like job training are difficult to obtain and schools are substandard. Broadband can help bridge these gaps. Today, millions of students are unprepared for college because they lack access to the best books, the best teachers and the best courses. Broadband-enabled online learning has the power to provide high-quality educational opportunities to these students—opportunities to which their peers at the best public and private schools have long had access. Similarly, with broadband, people with disabilities can live more independently, wherever they choose. They can telecommute and run businesses from their homes or receive rehabilitation therapy in remote and rural areas.

Of course, access to broadband is not enough. People still need to work hard to benefit from these opportunities. But universal broadband, and the skills to use it, can lower barriers of means and distance to help achieve more equal opportunity. Absent action, the individual and societal costs of digital exclusion will grow. With so many Americans lacking broadband access or the skills to make it matter, the Internet has the potential to exacerbate inequality. If learning online accelerates your education, if working online earns you extra money, if searching for jobs online connects you to more opportunities, then for those offline, the gap only widens. If political dialogue moves to online forums, if the Internet becomes the comprehensive source of real-time news and information, if the easiest way to contact your political representatives is through e-mail or a website, then those offline become increasingly disenfranchised.

What can your community do to insure its digital platforms improve citizen involvement?

Until recently, not having broadband was an inconvenience. **Now, broadband is essential to opportunity and citizenship.** While we must build on our strengths in innovation and inclusion, we need to recognize that government cannot predict the future. Many uncertainties will shape the evolution of broadband, including the behavior of private companies and consumers, the economic environment and technological advances. As a result, the role of government is and should remain limited. We must strike the right balance between the public and private sectors. Done right, government policy can drive, and has driven, progress. In the 1960s and '70s, government research funding supported the development of the technology on which the Internet is based. In the 1990s, the Federal Communications Commission acted to ensure that telephone providers would not stall use of the Internet. An act of Congress stimulated competition that caused cable companies to upgrade their networks and, for the first time, offer broadband to many Americans. Auctions for public spectrum promoted competitive wireless markets, prompting continual upgrades that first delivered mobile phones and, now, mobile broadband.

Instead of choosing a specific path for broadband in America, this plan describes actions government should take to encourage more private innovation and investment. The policies and actions recommended in this plan fall into three categories: ***fostering innovation and competition in networks, devices and applications; redirecting assets that government controls or influences in order to spur investment and inclusion; and optimizing the use of broadband to help achieve national priorities.*** A thoughtful approach to the development of electricity, telephony, radio and television transformed the United States and, in turn, helped us transform the world. Broadband will be just as transformative. The consequences of our digital transformation may not be uniformly positive. But the choice is not whether the transformation will continue. It will. The choice is whether we, as a nation, will understand this transformation in a way that allows us to make wise decisions about how broadband can serve the public interest, just as certain decisions decades ago helped communications and media platforms serve public interest goals. This plan is the first attempt to provide that understanding—to clarify the choices and to point to paths by which all Americans can benefit.

Can communities focus on the same three categories to foster innovation and competition, redirect assets that the local controls and optimize the use of broadband to help achieve local priorities?

Identify potential wireless
Broadband applications.

The importance of broadband continues to grow around the world. High-performing companies, countries and citizens are using broadband in new, more effective ways. We should be the leading exporter of broadband technology—high-value goods and services that drive enduring economic growth and job creation. And we should be the leading user of broadband-enabled technologies that help businesses increase their productivity, help government improve its openness and efficiency, and give consumers new

ways to communicate, work and entertain themselves.

The plan recommends that the country set the following six goals for 2020 to serve as a compass over the next decade.

Goal No. 1 at least 100 million U.S. homes should have affordable access to actual download speeds of at least 100 megabits per second and actual upload speeds of at least 50 megabits per second. This will create the world's most attractive market for broadband applications, devices and infrastructure. The plan has recommendations to foster competition, drive demand for increased network performance and lower the cost of deploying infrastructure. **These recommendations include providing consumers with information about the actual performance of broadband services, reviewing wholesale access policies and conducting more thorough data collection to monitor and benchmark competitive behavior. Reforming access to rights-of-way can lower the cost of upgrades and entry for all firms. Increased spectrum availability and use for backhaul can enable more capable wireless networks that will drive wired providers to improve network performance and ensure service is affordable. Government can also help create demand for more broadband by enabling new applications across our most important national priorities, including health care, education and energy, and by ensuring consumers have full control of their personal data.**

As a milestone, by 2015, 100 million U.S. homes should have affordable access to actual download speeds of 50 Mbps and actual upload speeds of 20 Mbps.

Identify your community's
broadband resources.

Goal No. 2 the United States should lead the world in mobile innovation, with the fastest and most extensive wireless networks of any nation. Mobile broadband is growing at unprecedented rates. From smartphones to app stores to e-book readers to remote patient monitoring to tracking goods in transit and more, mobile services and technologies are driving innovation and playing an increasingly important role in our lives and our economy. Mobile broadband is the next great challenge and opportunity for the United States. It is a nascent market in which the United States should lead.

Spectrum policy is the most important lever government has to help ensure wireless and mobile broadband thrive. Efficient allocation of spectrum consistent with the public interest will maximize its value to society. It will lower network deployment costs, making it easier for new companies to compete and enabling lower prices, more investment and better performance. Today, the FCC has only 50 megahertz of spectrum in the pipeline that it can assign for broadband use, just a fraction of the amount that will be necessary to match growing demand. As a result, companies representing 5% of the U.S. economy asked the FCC to make more spectrum available for mobile broadband, saying that "without more spectrum, America's global leadership in innovation and technology is threatened." To achieve this goal of leading the world in mobile broadband, the plan recommends making 500 megahertz of spectrum newly available for broadband by 2020, with a benchmark of making 300 megahertz available by 2015. In addition, we should ensure greater transparency in spectrum allocation and utilization, reserve spectrum for unlicensed use and make more spectrum available for opportunistic and secondary uses.

Goal No. 3 Every American should have affordable access to robust broadband service, and the means and skills to subscribe if they so choose. Not having access to broadband applications limits an individual's ability to participate in 21st century American life. Health care, education and other important aspects of American life are moving online. What's more, government services and democratic participation are shifting to digital

Are there pockets in your community where broadband is not being adopted?

platforms. This plan recommends government use the Internet to increase its own transparency and make more of its data available online. Getting everyone online will improve civic engagement—a topic this plan also addresses by recommending a more robust digital public ecosystem. Three requirements must be satisfied to ensure every American can take advantage of broadband. First, every American home must have access to network services. Second, every household should be able to afford that service. Third, every American should have the opportunity to develop digital skills. The plan recommends reforming existing support mechanisms to foster deployment of broadband in high-cost areas: specifically, the Universal Service Fund and inter-carrier compensation. To promote affordability, this plan also proposes extending the Lifeline and Link-Up programs to support broadband. To promote digital skills, we need to ensure every American has access to relevant, age-appropriate digital literacy education, for free, in whatever language they speak, and we need to create a Digital Literacy Corps. Achieving this goal will likely lead to an adoption rate higher than 90% by 2020 and reduced differences in broadband adoption among demographic groups. To the end, government can make broadband more accessible to people with disabilities. And it can ensure small businesses—many of which are owned by women and minorities—have the opportunity to purchase broadband service at reasonable rates.

Goal No. 4 every American community should have affordable access to at least 1 gigabit per second broadband service to anchor institutions such as schools, hospitals and government buildings. Schools, libraries and health care facilities must all have the connectivity they need to achieve their purposes. This connectivity can unleash innovation that improves the way we learn, stay healthy and interact with government. If this plan succeeds, every American community will have affordable access to far better broadband performance than they enjoy today. To do so, the plan makes recommendations about reforming the E-rate and the Rural Health Care support programs. Second, non-profit and public institutions should be able to find efficient alternatives for greater connectivity through aggregated efforts. What's more, unleashing the power of new broadband applications to solve previously intractable problems will drive new connectivity demands. The plan makes numerous recommendations, including reforming incentive structures, licensing and data interoperability, to ensure public priorities take advantage of the benefits that broadband networks, applications and devices offer. If they are implemented, demand for connectivity in hospitals, schools, libraries and government buildings will soar. In some communities, gigabit connectivity may not be limited to anchor institutions. Certain applications could also require ultra-high-speed connectivity at home. And once community anchors are connected to gigabit speeds, it would presumably become less expensive and more practical to get the same speeds to homes.

Goal No. 5 to ensure the safety of the American people, every first responder should have access to a nationwide, wireless, interoperable broadband public safety network. In June 2004, the 9/11 Commission released its final report about events of September 11, 2001. The report found that "the inability to communicate was a critical element" at each of the "crash sites, where multiple agencies and multiple jurisdictions responded." They concluded: "current networks do

What actions should local governments take regarding broadband public safety networks?

not take advantage of broadband capability, limiting their capacity to transmit data and hindering potential innovations in public safety that could save lives". The country should create a nationwide, wireless, interoperable broadband public safety network by 2020. The network should be robust enough to maintain performance in the aftermath of a disaster, and should allow every first responder, regardless of jurisdiction or agency, to communicate with each other and share real-time data over high-speed connections.

Goal No. 6 to ensure that America leads in the clean energy economy, every American should be able to use broadband to track and manage their real-time energy consumption. America can no longer rely on fossil fuels and imported oil. To improve national security, reduce pollution and increase national competitiveness, the United States must lead, not follow, in the clean energy economy. Encouraging renewable power, grid

What opportunities exist for energy management Broadband applications?

storage and vehicle electrification are important steps to improve American energy independence and energy efficiency; to enable these technologies at scale, the country will need to modernize the electric grid with broadband and advanced communications. Studies have repeatedly demonstrated that when people get feedback on their electricity usage, they make simple behavioral changes that save energy. Real-time data can also inform automated thermostats and appliances, allowing consumers to save energy and money while helping the country reduce the need for expensive new power plants. With strong cyber-security and privacy protections, consumers and their

authorized third parties should be able to get access to real-time usage information from smart meters and historical billing information over the Internet.

Excerpted from the Broadband KY e-Solutions Benchmarking Technical Report
[http://finance.ky.gov/initiatives/Broadband/Documents/e-Solutions%20Benchmarking%20Technical%20Report%20\(May%202012\).pdf](http://finance.ky.gov/initiatives/Broadband/Documents/e-Solutions%20Benchmarking%20Technical%20Report%20(May%202012).pdf)

This report presents the results of survey-based research carried out for the Commonwealth of Kentucky. The surveys collected information from businesses, organizations and households on the availability of broadband (high-speed Internet access) and its uses, benefits, drivers and barriers. The survey results provide insight into gaps and opportunities for increasing broadband utilization by organizations and households. The report focuses on key findings and data that will be useful in planning for broadband infrastructure and adoption initiatives in Kentucky.

The survey was deployed as a state-wide online process to document broadband utilization and connectivity among both organizations (commercial and non-commercial) and households. The survey explored these issues at a very detailed level, generating a large quantity of data, only the highlights of which are covered in this report.

The Broadband KY e-Solutions Benchmarking Technical Report (eSB Report) will be followed by a separate report on Broadband KY e-Strategies that includes recommendations for how Kentucky and its regions can improve the utilization of broadband, thereby improving their economies and quality of life. The Broadband KY e-Strategies Report is for broader circulation, while this eSB Technical Report serves as a reference document for the client. In addition it should be noted that a large amount of the data collected through this initiative is available through an online platform (*Broadband KY Digital Economy Analytics Platform - DEAP*) which is accessible by the Office of Broadband Outreach and Development and designated stakeholders.

The core methodology is founded on primary research via data collection through online surveys of businesses, organizations and households. Due to the distinct nature of the uses and benefits of different categories of Internet users, separate and distinct surveys are used for organizations and for households. While the nature and purpose of the question sets are parallel for each survey, the questions are formulated in contexts specific and relevant to each of these basic user categories.

In addition to the main set of questions that all organizations were asked, a number of small “modules” (consisting of four to 10 questions) were added to those respondents identifying themselves as belong to one the following key sectors: farming, K-12 schools, colleges, health care, public safety, and local government.

Both the business survey and the household survey are designed to collect information directly from Internet users in the following categories:

User Profile – information that characterize each respondent for purposes of statistical analysis based on user characteristics, e.g. organization size by employment, household income, time of Internet use, etc.

Internet Utilization – the current and planned uses of the Internet across multiple categories relevant to how organizations and households may use the Internet. The primary type of Internet connection used is also identified for selected cross tabulations with other response data.

Internet Benefits – information on how organizations and households assess the benefits of using the Internet.

Barriers - information on the importance of factors that prevent or inhibit organizations and households from taking full advantage of the Internet.

The surveys are made available for online access through one of two means:

- Individual organizations and households were invited to participate via direct email invitations sent from a large, state-wide contact list.
- In addition, organizations and households were encouraged through a variety of other communications channels to access a link to the survey through the website of the Office of Broadband Outreach and Development (OBOD).

An active public outreach and awareness campaign was carried out by OBOD and the Kentucky Council of Area Development Districts. This campaign included press releases from the governor and OBOD, media interviews, and engagement of stakeholder organizations (requesting that they endorse and promote the survey through their networks.

E-mail invitations were sent directly to 80,000 households and 19,000 organizations in Kentucky. Strategic Networks Group purchased two contact lists from a national list provider. Surveys were deployed using direct email invitation to households and organizations providing access to online surveys. The initial email invitations were sent initial on February 8th, 2012, followed by four reminder emails. The surveys were closed on March 27th. **Broadband KY e-Solutions Benchmarking Technical Report 2012**

Survey responses were received from **2,252 businesses and organizations**, and from **4,122 households**. For these survey sample sizes the overall error margin for statistical analysis are +/- 2.1 percent for organizations and +/- 1.5 percent for households (with a 95 percent Confidence Interval)¹⁴. The sample error margin indicates the accuracy of the statistics derived in relation to how they represent the larger population. Using a 95 percent Confidence Interval, a statistic should fall within the error margin for any random sample of the population 95 percent of the time. The sample error margin is calculated based on the sample size, the population size, and the confidence interval. For 95 percent confidence interval and for populations much larger than the sample, the sampling error is 0.98 divided by the square root of N, where N is the sample size. For this report all population sizes are much larger than the sample sizes.

The following is an example for interpretation of statistics provided in this report:

- 38.8 percent of organizations use the Internet for selling goods or services online.
- The sample size for organizations reporting Internet utilization is 2,022, providing a sample error margin of +/- 2.2 percent with a 95 percent confidence interval.

This means that any similar sample of the population of organizations across the state will result in a statistic for selling goods or services one between 36.4 percent and 41.0 percent (38.8 percent +/- 2.2 percent) 95 percent of the time. The statistic would fall outside this range 5 percent of the time for other random samples of the population. In practical terms the sampling error can be taken as the accuracy of the statistic as it applies to the entire population. Smaller sample sizes result in larger sampling errors. When comparing statistics between two independent samples, e.g. the same statistic for broadband users vs. dial-up users, the sample errors for each sample must be considered to determine if the difference is significant.

Example – Households paying bills online:

- Dial-up household sample size = 174, with a sample error of +/- 7.4 percent
- Broadband household sample size = 3,544 with a sample error of +/-1.6 percent
- Dial-up statistic is 45.4 percent +/- 7.4 percent, or between 38.0 percent and 52.8 percent, 95 percent of the time.
- Broadband statistic is 81.6 percent +/- 1.6 percent, or between 80.0 percent and 83.2 percent, 95 percent of the time.

While the error margin for the dial-up sample is relatively large, the ranges of the statistics do not overlap, i.e. the higher end of the dial-up statistic (52.8 percent) is less than the lower end of the broadband statistic (80.0 percent), the difference can be considered statistically significant. The difference between the statistics can be taken as given, i.e. 81.6 percent – 45.4 percent = 36.2 percent, or more conservatively as 80.0 percent – 52.8 percent = 27.2 percent. Where the difference between statistics is within the sampling error margin ranges, then such differences may not be real or significant for other random samples of the same sizes. For simplicity of reporting the statistics are stated as given with sample sizes and sampling error margins provided for interpretation.

Excerpted from <http://www.broadband.gov/ruralareas.html>

Because of relatively low population density, topographical barriers, and greater geographical distances, broadband service may be more difficult to obtain in some rural areas. In attempting to address these challenges, some rural communities have found it helpful to develop a strategic plan for broadband deployment that includes creating a comprehensive business proposal to broadband providers. Such a plan, for example, could demonstrate to broadband providers that deployment is a sound business decision that would benefit both the providers and the community. This strategic planning process may include, but is not limited to, the following elements and strategies:

- Educating the community about the potential benefits of broadband service.
- Creating partnerships among community organizations and institutions that might benefit from broadband deployment.
- Systematic assessment and prioritization of the community's needs for broadband service.
- Aggregating (consolidating) demand within the community to make service profitable for broadband providers. Participants may include, but are not limited to, individual consumers, businesses, educational institutions, health care facilities, and government agencies.
- Identifying an anchor tenant with adequate demand to spur infrastructure investment in broadband.

Excerpted from *Bringing Broadband to Rural America: Update to Report on a Rural Broadband Strategy*

Development in Rural Broadband

The 2008 Farm Bill directed the Chairman of the Federal Communications Commission (Commission), in coordination with the Secretary of Agriculture, to submit to Congress a report describing a "comprehensive rural broadband strategy" in 2009. The 2008 Farm Bill also required the Chairman, in coordination with the Secretary of Agriculture, to "update and evaluate" the Rural Broadband Report in 2011. This Report constitutes that update and evaluation. It focuses on key actions at the Commission, the U.S. Department of Agriculture's (USDA's) Rural Utilities Service (RUS), and the Department of Commerce's National Telecommunications and Information Administration (NTIA) to meet the demand for affordable, high quality broadband services in rural communities, including historic investments made under the American Recovery and Reinvestment Act (Recovery Act). While significant progress has been made to increase rural broadband deployment and adoption since the publication of the 2009 Rural Broadband Report, and a number of private- and public-sector initiatives are underway, additional efforts and new policies—including major universal service policy reform—are still required to ensure that rural America fully shares in the benefits of the emerging broadband economy.

All Americans, whether they live in rural or urban areas, should have access to robust and affordable broadband services—as well as the ability to use those services—in order to take advantage of the many opportunities the digital revolution has created. Broadband can unlock new opportunities for Americans with respect to "consumer welfare, civic participation, public safety and homeland security, community development, health care delivery, energy independence and efficiency, education, worker training, private-sector investment, entrepreneurial activity, job creation and economic growth, and other national purposes." As the Rural Broadband Report noted, broadband is critical to bringing these benefits to rural areas, which are less likely than urban areas to have broadband available. RUS, NTIA, and the Commission are working collaboratively to evaluate and support the communications needs of rural communities.

The nation has made significant progress in the two years since the Rural Broadband Report was released in deploying broadband infrastructure and in implementing and modernizing policies and programs to facilitate broadband deployment and adoption across the nation. During this time, the public and private sectors have made substantial investments to extend and upgrade broadband networks—including in some in-

stances as a result of voluntary commitments to the Commission. This investment has included approximately \$8 billion in grants and loans to expand broadband deployment and adoption in unserved and underserved areas under RUS's Broadband Initiatives Program (BIP) and NTIA's Broadband Technology Opportunities Program (BTOP), as well as grants and loans provided by RUS for rural communications networks through ongoing programs. By working cooperatively with Tribal, federal, state, and local government entities and industry and consumer groups, the Commission is collecting better broadband data, reducing barriers to broadband deployment by improving access to poles and rights of way for wireline and wireless facilities, and working to reform a number of other policies and programs that will encourage rural broadband deployment. NTIA, in cooperation with the Commission and entities in every state, has unveiled the National Broadband Map—"a searchable and interactive website that allows users to view broadband availability across every neighborhood in the United States."

Many of these actions to expand broadband deployment and use are nascent; their full impact has not yet been realized and may be difficult to measure for some time. But it is clear that much more remains to be done to ensure that every American has the opportunity to participate in the broadband era. The best data available indicate that more than 20 million Americans lack access to broadband that meets the benchmark set forth in the *Seventh Broadband Progress Report*. Significantly, approximately 73 percent of these Americans reside in rural areas.

Closing the broadband gap in rural areas and building a world-leading broadband infrastructure requires smart government policies that enable broadband providers to extend and expand broadband availability. These policies must ensure fiscal responsibility and accountability, and should utilize market-driven approaches wherever appropriate. The Commission, NTIA, and the states must further improve data collection and mapping so we know more precisely where resources should be targeted. The Commission must reform and modernize the Universal Service Fund (USF) programs and inter-carrier compensation system to ensure that broadband providers have appropriate incentives to deploy and encourage adoption of broadband in rural areas. The Commission also must continue to remove barriers to rural broadband deployment to promote further private and public investment, innovation, and job creation. And the Commission must increase the deployment of wireless infrastructure in rural areas. These actions, many of which are underway, seek to increase the opportunities for rural residential and business consumers so that they can participate fully in today's global economy.

Good data drive good policymaking. The 2009 Rural Broadband Report recognized that a lack of comprehensive and reliable data on the extent of broadband deployment, speeds, and subscribership, among other information, constituted a significant obstacle to improving policies to bring affordable and robust broadband services to rural America. Since publication of that report, the collective efforts of federal, state, and private interests have resulted in some improvement in available broadband data.

[Link to Kentucky Broadband Data and Mapping Website](#)

<http://www.bakerbb.com/kybroadbandmapping/>

Interactive map displaying broadband access in Kentucky.

[Links to IBM's Smarter Cities: Building Smarter Cities](#)

<http://www.youtube.com/watch?v=2PtIWdS6UZA&feature=channelvideotitle>

Just like businesses, cities compete in a global marketplace. By leveraging technology, they can use information to engage their communities, deliver better services, and lure prospective citizens.

<http://www.youtube.com/watch?v=TULPgbLz-UA&feature=channelvideotitle>

Safe neighborhoods. Quality schools. Affordable housing. Traffic that flows. It's all possible. Making cities more instrumented, interconnected and intelligent isn't only about overcoming the challenges they face. It also recognizes that cities provide us with some of the greatest opportunities for making the planet smarter, too.

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