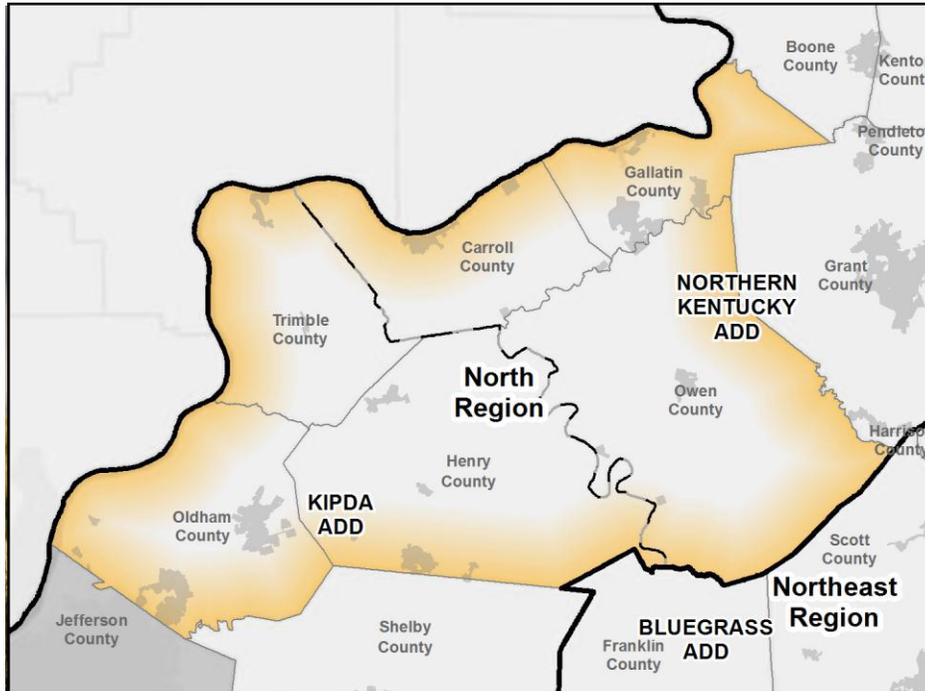


Broadband KY

Improving Bandwidth and Access for World Class Broadband in North Kentucky (Carroll, Henry, Gallatin, Oldham, Owen, and Trimble Counties)



This report based on input received from KIPDA and Northern Kentucky Area Development Districts, and regional stakeholders, and prepared by Strategic Networks Group in partnership with Michael Baker Jr., Inc.

March 19th, 2013

Prepared for:
**Commonwealth Office
of Broadband Outreach and Development
&
Kentucky North Region Working Group**



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Introduction

This broadband planning document is one of five plans that have been developed as part of the Broadband KY initiative. Each of the five plans addresses a distinct set of broadband issues within a defined geographic area.

The five plans have both shared and distinct components. The shared components consist of a Kentucky-wide framework for broadband planning that establishes a common set of principles and high-level priorities across Kentucky. One of the strategic priorities shared across all regions and plans is development of the local and regional leadership needed to build sustainable momentum for improving broadband.

The distinct components of each plan are comprised of strategies and action plans specifically designed to address the priorities, circumstances and capacities of each region. All five plans have identified the lack of broadband availability as one of their local priorities. Consequently, these plans share a strategic approach to addressing this wide-spread challenge.

Creation of these plans has been through a partnership between the Commonwealth of Kentucky Office of Broadband Outreach and Development (OBOD) and Kentucky's Area Development Districts through the creation of five Project Area Working Groups. The working groups have been led by the Area Development Districts, engaging with stakeholders from the project area addressed by the plan.

Each of the five plans draw upon a body of work produced and compiled over the past several years:

- Commonwealth of Kentucky, State Broadband Initiative (SBI) maps
- Broadband KY – Central Planning Session documents and maps
- Broadband KY – Regional Provider Directories
- Broadband KY – Project Glossary
- Project Area Scope-of-Work Document
- 2012 e-Solutions Benchmarking Technical Report
- 2012 e-Strategy Report
- Regional Project Area Profile Report
- IPA Workshop – Regional Outcomes Report
- Regional Work Group Meeting Notes
- Broadband KY – Regional maps --
 - Broadband availability,
 - Household and Organization Utilization Analysis
 - KY -- Population
 - Transmission Technology
 - Upload and Download Speed



All information will become part of a Broadband planning resource document as a reference to the final regional plan, and available by qualified project participants online upon request.

The individual plans were prepared for OBOD by Strategic Networks Group, working in partnership with and under direction of Michael Baker Jr., Inc.

1. Executive Summary

With the creation of the Commonwealth Office of Broadband Outreach & Development in October 2010, the Commonwealth of Kentucky made a commitment to pursue solutions for local broadband challenges in adoption and utilization. Key to its efforts has been this strategic approach that positions the Commonwealth as an enabler of local and regional efforts.

Kentucky's commitment to improved broadband access, adoption and utilization is based on an understanding of the impacts that broadband has on the wellbeing of Kentucky's citizens, economy and government services. Initiatives that address the digital divide at a local level are paramount.

In the North Region project (Carroll, Henry, Gallatin, Oldham, Owen, and Trimble Counties), this regional planning process was initiated in May 2012 with the active involvement of the Area Development Districts as regional leaders. Since then, the planning process has been progressing through a series of conference calls and two stakeholder workshops in October 2012 and February 2013.

After considering the many aspects of the digital divide within its communities, the North Region Working Group has adopted a vision statement to guide this plan:

“Initiate private-public partnerships and foster community leadership needed for the creation of broadband infrastructure that addresses the region’s economic development and residential efforts.”

As a result of the planning process noted above, to address the priorities identified by the Regional Work Group and the Stakeholders, three objectives have been established and documented in this plan:

1. Development of the **leadership and institutional capacity** needed to initiate and sustain broadband efforts at the local or regional level;
2. Enabling nationally competitive broadband for commercial enterprises along the I-71 Corridor
3. Improving availability of broadband in rural residential areas

During the final development stage of this plan the KC-ADD requested the establishment of a regional broadband council under the auspices of the Area Development Districts. This issue will be considered by the Office of Broadband Outreach and Development after the Project Area plans are submitted.

To assist in developing a plan to bridge the digital divide, an assessment of the current situation was undertaken (Sections 5 and 6). One important conclusion from this assessment is that that local leadership is critical in *developing momentum in unserved and underserved communities*, especially areas with limited institutional capacity and a small population base.

Section 7 sets out recommendations to address the planning objectives and to build the momentum needed to produce meaningful broadband outcomes in the target areas. The adoption of a flexible approach is a strategy that acknowledges the uncertainty over the level of resources available to implement the plan.

The plan provides recommendations for addressing these challenges on a local level, identifies steps for achieving goals, explores potential mechanisms for measuring outcomes through community efforts, and also provides information on how to build momentum around Broadband initiatives in the project area. Recommendations will be scalable to available funding.

The strategic direction set out in this plan is based on establishment of initial, short and medium term recommendations that can be scaled and adapted to reflect the availability of funds and commitment. Implementation times for recommendations are based on the timeline in the NTIA Broadband Planning Grant received by the OBOD, from 2011 to December 2014.

By providing for varying levels of activity, regional stakeholder focus is on activities that are within the resources available, while providing for more ambitious actions and tasks as additional resources become available. Building on this approach, the detailed recommendations for this strategic planning report can be found in sections 7.1 and 7.2.

Section 8 provides an Action Plan template for developing detailed actions and tactics to support the recommendations outlined in this document. The template will continue to be utilized after completion of the plan to identify ongoing tasks, timelines, and responsibilities associated with the project area plan.

Section 9 identifies specific metrics for measuring the progress of **components** (Section 8) within the plan, and the degree to which each component has produced tangible results.

2. Purpose and Focus

This document is designed to assist community efforts in achieving better access and effective use of broadband services. Through efforts to improve broadband, the people, businesses, and government bodies in Kentucky can improve opportunities, promote a dynamic economy, and develop healthy and resilient communities.

The foundation of this broadband planning document is a Kentucky-wide Strategic Framework that consists of the following elements:

- A core set of principles that reflect the Commonwealth's values and strategies regarding broadband;
- A clear understanding of why broadband matters;
- Emphasis on regions and communities currently lagging behind other areas of Kentucky;
- A clear rationale for government policies and programs;
- High level goals for broadband initiatives that establish purpose and expectations for local community-based broadband initiatives;
- Development of regional broadband plans as a resource to communities in each region.

According to 2012 **Broadband KY eStrategy Report** and **Kentucky SBI¹ Data**, gaps currently exist in the availability and usage of Broadband services, with some sectors of the economy slow to adapt to the increasing pace of the knowledge-based economy. This planning document identifies how certain aspects of digital divide can be addressed in a defined project area within the North Region of Kentucky. While the Commonwealth of Kentucky can be an advocate and enabler (documenting best practices and developing tools and assistance programs), the most effective change agents are at the local level -- driving action and implementation on the frontline of broadband initiatives.

The strategies in this document focus on the digital divide, which can be seen in areas that are unserved and underserved² by broadband services, as well as in populations that are underutilizing the Internet.

This Broadband Planning document has the following purpose:

¹ SBI – State Broadband Initiative: NTIA program; Investment of approximately \$4 billion in the United States to support the deployment of broadband infrastructure, enhance & expand public computer centers, encourage sustainable adoption of broadband, and promote statewide broadband planning and data collection.

² NTIA definition - *Unserved* and *Underserved*: "**Unserved**: An area, composed of one or more contiguous census blocks where at least 90% of households in the proposed funded service area lack access to facilities-based, terrestrial broadband service, either fixed or mobile, at the minimum-broadband speed. The rules defined **Underserved** for Last Mile Projects: "An area composed of one or more contiguous census blocks where at least one of the following is met: 1) no more than 50% of households in the proposed funded service area have access to facilities-based, terrestrial broadband service at greater than the minimum broadband speed; 2) no fixed or mobile broadband service provider advertises broadband speeds of at least 3 Mbps downstream in the proposed funded service area; or 3) the rate of broadband subscribership for the proposed service area is 40% of households or less.

- a) Defining a Strategic Framework for Planning
- b) Assessing the current state of broadband access in North Kentucky
- c) Providing Objectives and Recommendations with supporting Strategic Direction

3. Core Principles

The core principles that guide broadband planning in Kentucky:

- a) The Commonwealth is an enabler of local efforts to address the digital divide.
- b) Broadband initiatives should always recognize the complementary roles of markets (consumers and providers), communities, and local governments.
- c) Broadband initiatives should build on benchmarks and comparative assessment of communities, regions and sectors that have been developed through the Broadband KY initiative.
- d) Priority should be given to the digital divide in access, adoption and use of the Internet. More specifically, priority to “Unserved” and “Underserved” areas in terms of Internet access.
- e) The Commonwealth will endeavor to provide options and resources to support local broadband initiatives addressing the digital divide.

4. Why Broadband Matters: *Benefits of Broadband Investments*

In the twenty-first century, the Internet has become an essential part of a region’s infrastructure, a business’s internal and external operations, and a household’s participation in their community life. Availability and meaningful use of the Internet speaks directly to a community’s viability, competitiveness and quality of life. The shift to the knowledge economy manifests itself at a variety of levels, from the private sector to public services to the private household. At each of these levels, Internet based activities have become integrated in the daily functioning of businesses, governments and individuals. The Internet facilitates communications, innovation, recreation, and production and Broadband access is an essential technology infrastructure to enable the knowledge economy.

For government organizations, the impact of the Internet can be felt in terms of cost efficiency, accountability and the ability to deliver services to local residents. With all levels of government moving services to the Internet, those who don’t use the Internet find themselves with increasingly restricted access to government information and services.

From an economic perspective, broadband (see page 10 for description) impacts local and regional economies by facilitating internal business growth and retention, while attracting new businesses. In a similar manner, broadband facilitates development of a skilled labor force and allows a community to compete for skilled labor that will not move to an area without broadband. The implication is that those areas that don’t have broadband will lose existing skilled labor and businesses, while failing to attract new businesses and skilled residents.

Two recent reports from *Broadband KY*³ have provided evidence of the impacts of broadband on the economy of Kentucky and its regions. The findings of the report underscore the large and critical role that the Internet plays in the shift to a knowledge economy. First and foremost, job creation is a vital aspect of the impact of broadband. The report found that the Internet contributes significantly to job growth, with jobs facilitated by the Internet accounted for almost one third of all new jobs. The number of jobs lost (1,812) and created (3,498) over the preceding 12 months in the 720 reporting organizations in Kentucky. The seemingly high “churn” of job loss and creation is a natural part of a healthy economy. The small business sector (0 to 19 employees) was particularly effective at creating jobs through the Internet. Although this group contained less than 5 percent of all employment in the reporting group, this group produced 11.1 percent of all new jobs and Internet enabled jobs.

Evidence of the pronounced impact of broadband on the health of a local and regional economy is growing and indisputable. But for many, the mechanisms of these impacts are unclear. To better understand why broadband produces the impacts attributed to it, it helps to identify some of the specific ways in which broadband benefits the operations of businesses. Drawing on 2012 broadband utilization benchmarking data from Kentucky, the benefits most valued by businesses fell into three categories:

- **Productivity:** the Internet makes operations easier and allows organizations to more effectively use their resources.
- **Customer support and reach:** the Internet allows businesses to improve customer support, while also helping them reach new customers, often on a global scale.
- **Profitability:** Increased use of the Internet results in a growing revenues from the Internet, which is one of the fastest areas of growth. Use of the Internet also helps in reducing costs.

However, broadband availability and effective utilization is not equally present across Kentucky, as explored in the next section of this report. The relatively low level of broadband availability, adoption and use in Kentucky¹ has a negative impact on job creation and attraction of new businesses in those regions. Consequently, the lack of competitive broadband strongly impacts the ability of a region to retain its existing businesses and population.⁴

Local and regional leaders face the challenge of assessing how their community or region is performing on broadband issues. They face the challenge of finding the means to improve performance, whether it is access to the Internet, adoption of the Internet or productive use of the Internet. The following sections provide information and strategies to help local and regional leaders in addressing these challenges.

³ ***Broadband KY eStrategy Report:*** May 2012 and: ***Project Area Profile: North Kentucky, (Appendix III).***

⁴ The 2012 SNG report that benchmarked broadband utilization across Kentucky found that over 19% of households would “definitely” relocate to another community for broadband service if it was not available to them in their current location. Another 20% would consider relocation “very likely”. Broadband was also considered “essential” for selecting location by 36% of businesses and other organizations, as well as “essential” for remaining in location by 59% of organizations.

5. Current Status: How is North Kentucky Doing?

Given the importance of broadband to the current and future health of the North Region, its communities, residents and businesses, it is important to assess the North Region’s situation regarding broadband availability. The evidence drawn from national, Kentucky-wide, and regional sources shows the digital divide in the North Region is very real. The various broadband maps and utilization surveys undertaken by Broadband KY identify areas, households, and businesses that continue to face barriers to participating fully in the digital economy. The data and perspectives presented reflect this document’s focus on local broadband planning. Wherever possible, data from the project area are used. Additional data sources are used where needed.

5.1 Broadband Access

This section looks at how North Kentucky performs in terms to access to the Internet relative to both national and Kentucky targets. The assessment may need to be adjusted periodically to reflect the rapidly changing face of Internet access.

What is Broadband? The following definition of "Broadband" comes from the National Broadband Map of the National Telecommunication and Information Administration (NTIA) web site. “Broadband refers to a high-speed, always-on connection to the Internet. The primary factors that people consider when deciding what type of broadband Internet service to subscribe to include service availability, connection speed, technology, and price. Organizations define broadband in different ways. For information to be included on the National Broadband Map, the technology must provide a two-way data transmission (to and from the Internet) with advertised speeds of at least 768 kilobits per second (Kbps) downstream and at least 200 Kbps upstream to end users.” More recently, ***the FCC has set a goal of affordable broadband with a minimum download speed of 4 megabits per second***⁵. For the sake of consistent use of terminology, the FCC has defined the following “Internet speed tiers”.

| FCC Speed Tier Download Speeds Broadband | | |
|--|-----------------------|----------|
| | From | To |
| 1st Generation | 200 Kbps | 768 Kbps |
| Tier 1 Broadband | 768 Kbps | 1.5 Mbps |
| Tier 2 Broadband | 1.5 Mbps | 3 Mbps |
| Tier 3 Broadband | 3 Mbps | 6 Mbps |
| Tier 4 Broadband | 6 Mbps | 10 Mbps |
| Tier 5 Broadband | 10 Mbps | 25 Mbps |
| Tier 6 Broadband | 25 Mbps | 100 Mbps |
| Tier 7 Broadband | Greater than 100 Mbps | |
| | | |

| FCC Activity Minimum Recommended Download Speeds(Mbps) | |
|--|---|
| Application | Minimum Speed Recommended (megabits per second) |
| Email | 0.5 |
| Web browsing | 0.5 |
| Job searching, navigating government websites | 0.5 |
| Interactive pages and short educational videos | 1 |
| Streaming radio | Less than 0.5 |
| Phone calls (VoIP) | Less than 0.5 |
| Standard streaming videos | 0.7 |
| Streaming feature movies | 1.5 |
| Basic video conferencing | 1 |
| HD-quality streaming movie or university lecture | 4 |
| HD video conference and tele-learning | 4 |
| Game console connecting to the Internet | 1 |
| Two-way online gaming in HD | 4 symmetrical |
| Lower definition telemedicine | 0.6-1 symmetrical |
| HD Telemedicine (diagnostic imaging) | 5-10+ symmetrical |

The Office of Broadband Outreach and Development collects data from Broadband Service Providers. Mapping depicting this information is available online:

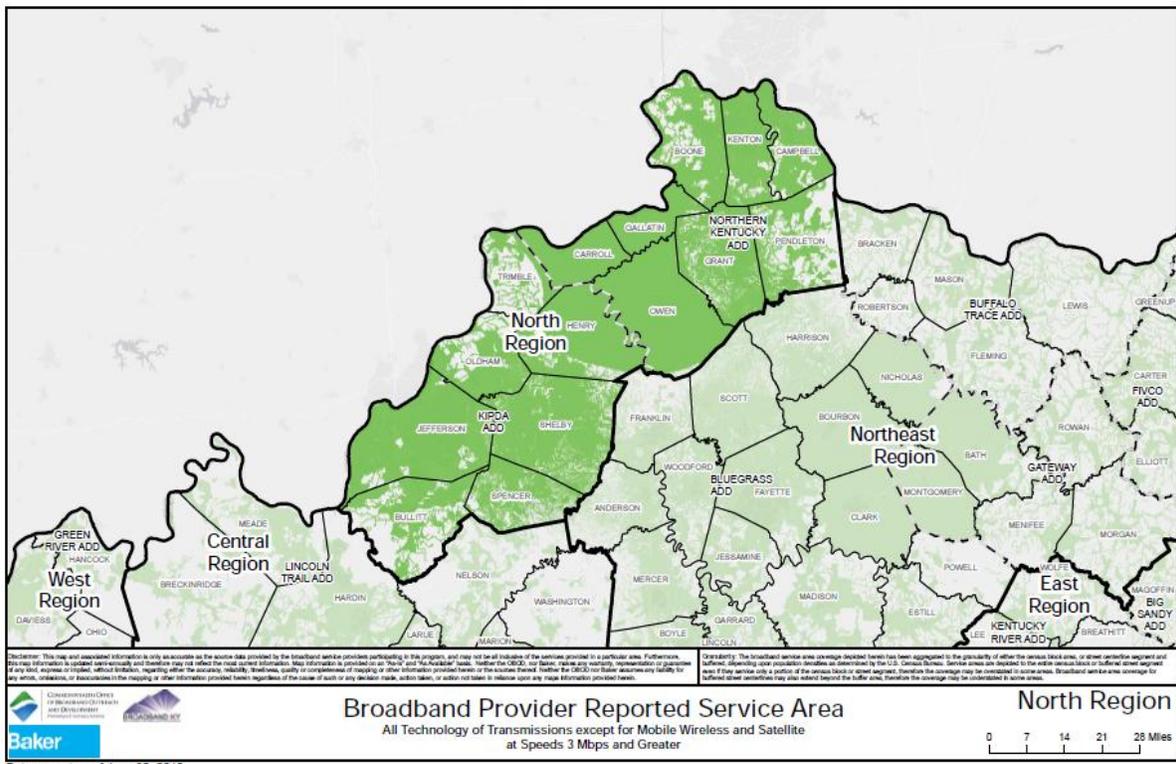
<http://www.bakerbb.com/kybroadbandmapping/>

During the broadband planning workshops, participants (including local service providers) reported that this mapping may not show the entire details of actual local Broadband availability. Section 7 and Appendix 1 lays out a process for documenting detailed coverage at the local level.

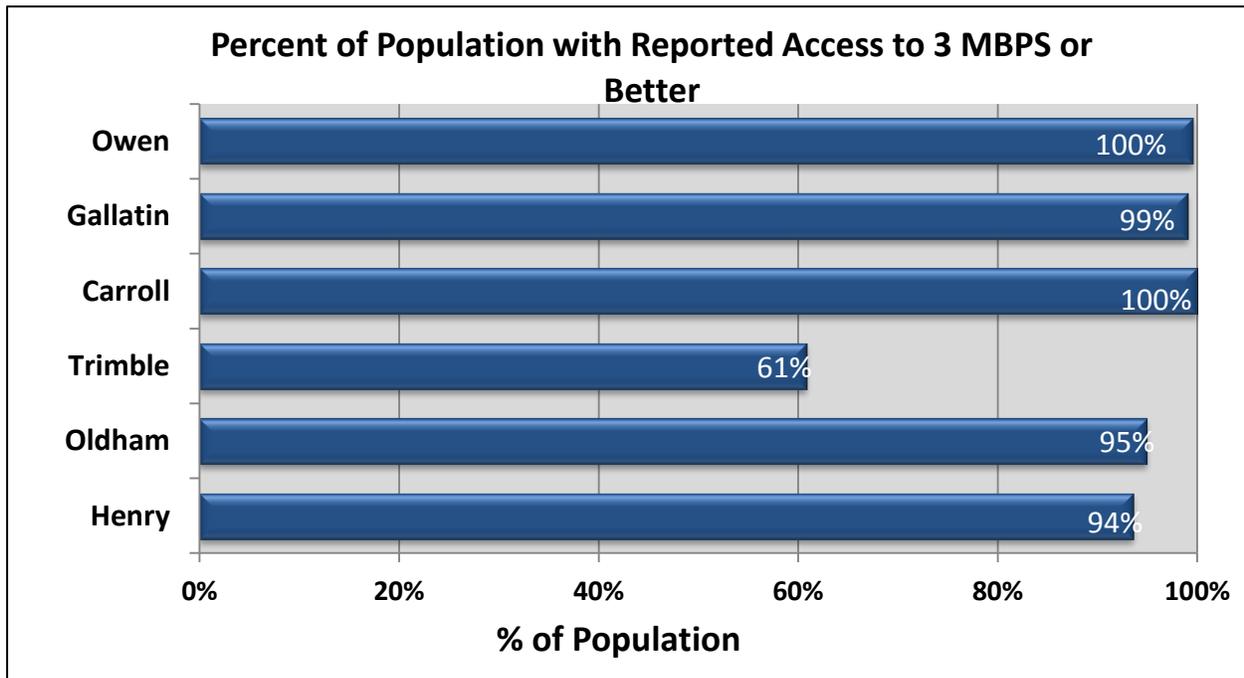
⁵ <http://download.broadband.gov/plan/national-broadband-plan-executive-summary.pdf> (page 3).
“Ensure universal access to broadband network services: create the Connect America Fund (CAF) to support the provision of affordable broadband and voice with at least 4 Mbps actual download speed.”

In its National Broadband Plan of 2010, the FCC identifies 4 MBPS as the short-term target for download speed in communities nationwide. While current Kentucky SBI data does not breakout broadband coverage at this speed, this report uses 3 MBPS download as a benchmark for assessing current broadband coverage throughout Kentucky. The plan does not include satellite or mobile wireless Internet service in its assessment due to the challenges these technologies face with cost and reliability. This may be addressed in the future with advances in technology.

According to Kentucky SBI provider data, Trimble County is the one county in the Project Area well below the target of 4 MBPS. The information provided is current as of January 1, 2013:



Data current as of June 30, 2012



Broadband coverage is becoming more complex with the growth of mobile wireless coverage and the increasing use of smartphones accessing the Internet. Assessing the impact of 4G wireless networks on broadband availability, adoption, and utilization is still in its early stages. For the most part, smartphones, tablets and other mobile devices are valuable adjuncts to a business’ or household’s broadband access. However, mobile wireless is not presently attractive as the primary means of broadband access, especially for organizations. With lower levels of reliability, higher costs, usage caps and smaller screens, mobile broadband is usually not a good option as the primary Internet connection for businesses. For households, mobile wireless may be more attractive as a primary vehicle for accessing the Internet, though the situation depends greatly on usage patterns of each individual. For a community, having mobile broadband wireless coverage may be seen as necessary to remain a viable place for its businesses and residents. However, most will not see mobile wireless as desirable as the primary means of broadband connectivity.

There are considerations beyond simple availability of basic broadband, especially for businesses and community anchor institutions such as educational institutions, libraries and public safety agencies. As the Internet becomes a more integral part of the operations and critical systems of an organization, reliability usually becomes as or more important than speed. Moreover, for businesses with truly critical operations that are dependent on the Internet, the ability to have more than one means of access (redundancy) to the Internet becomes a major consideration in locational decisions. With the goal of achieving nationally competitive businesses along the I-71 Corridor, counties in the North Kentucky Broadband Planning Area need to consider the #1 Goal of the NTIA 2010 National Broadband Plan: *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.*⁶ Based on input from regional planners, available broadband falls far short of these levels. To keep the project area a competitive place for business in the future, the Regional Work Group has identified the importance of having “World Class” broadband. This makes developing and maintaining a more proactive posture is an important element for the region.

Whether a community’s motivation is acquiring basic broadband or upgrading beyond basic broadband, a similar challenge presents itself. If there is sufficient demand for broadband services as well as a competition among local Internet Service Providers (ISPs), the market will most likely address the needs of that community. Where there is limited demand or competition, communities may decide to undertake initiatives to address the lack of (adequate) broadband service. The options available to communities in this latter situation are explored in Section 7.

6. Strengths, Weaknesses, Opportunities and Threats

The document sets forward the following as goals for the Commonwealth of Kentucky:

- a) Communicating the value of internet access to improve the lives of all citizens;
- b) Accelerating the expansion of sustainable Broadband access, participation, and adoption by citizens and businesses in the digital economy and society;
- c) Promoting Broadband use to be globally competitive and to enable a better economy;

The preceding section shows that the current situation in the North Region falls short of meeting these goals. If North Kentucky is to make meaningful progress towards these goals, it is important to assess the current situation. This planning document uses the SWOT process that identifies current **S**trengths and **W**eaknesses, as well as future **O**pportunities and **T**hreats. The table below provides a snapshot assessment using SWOT. Section 7 will draw on this SWOT assessment to develop strategies that address the weaknesses and threats, while building on current strengths and future opportunities.

| | |
|--|---|
| <p style="text-align: center;"><u>Strengths</u></p> <p style="text-align: center;">Interest from many local stakeholders</p> <p style="text-align: center;">Role of the OBOD as a Broadband advocate and enabler</p> <p style="text-align: center;">Improved potential from wireless services (fixed and mobile)</p> <p style="text-align: center;">Regional high-tech business sector</p> | <p style="text-align: center;"><u>Weaknesses</u></p> <p style="text-align: center;">Low density population in unserved rural areas</p> <p style="text-align: center;">Poor business case for conventional solutions</p> <p style="text-align: center;">Lower interest among some incumbent ISPs</p> <p style="text-align: center;">Limited financial capacity at all government levels</p> <p style="text-align: center;">Many competing high-priority projects in rural communities</p> |
| <p style="text-align: center;"><u>Opportunities</u></p> <p style="text-align: center;">Fixed and mobile wireless technology</p> <p style="text-align: center;">Greater provider collaboration</p> <p style="text-align: center;">Public-private partnerships</p> <p style="text-align: center;">Renewed interest from incumbent Providers</p> | <p style="text-align: center;"><u>Threats</u></p> <p style="text-align: center;">Economic uncertainty</p> <p style="text-align: center;">Global competition eroding local economic base</p> <p style="text-align: center;">Fiscal constraints on all levels of government</p> <p style="text-align: center;">Current Provider economics make it less attractive for last mile investments</p> |

Strengths

- There is a broad appreciation among non-metro communities of the importance of broadband. Understanding of the benefits of broadband is significantly greater than three or four years ago.
- The Commonwealth has been very supportive of local and regional efforts to expand last mile broadband infrastructure.

- The increased technical capacity of both fixed and mobile wireless have provided some previously unserved or underserved areas with cost effective Internet access.
- North Kentucky has a growing high tech sector that has potential for growth and developing business clusters.

Weaknesses

- Many unserved rural areas in the North Region project area have low population density and challenging topography.
- Unserved or underserved areas with low populations and challenging topography make a poor business case, especially for conventional landline based Internet services. These areas may be difficult to serve without public financial support and are also less likely to have the institutional capacity and leadership needed to take advantage of the resources and opportunities available.
- In some non-metro areas that have developed broadband infrastructure, there has been low adoption of broadband services or primarily adoption of lower end and lower cost services. This has resulted in lower than anticipated revenues for providers, while also indicating that local businesses and households are not realizing the potential benefits of many broadband services.
- The dynamics described in preceding points may mean incumbent ISPs are less motivated to expand landline services in unserved and underserved areas.
- Due to their small size and limited staffing, most non-metro communities have limited capacity and face challenging fiscal circumstances that constraint their ability to respond to low levels of broadband availability, adoption and utilization.
- There is presently little interest or energy given to broadband issues in rural and non-metropolitan communities due to many competing high-priority projects in rural communities.

Opportunities

- Across the US, fixed wireless is increasingly seen as an attractive and viable infrastructure technology for last mile (and occasionally middle mile) Internet access in non-metro areas. With low capital costs, relatively short installation schedules, and an ability to use existing “vertical assets”, fixed wireless offers an opportunity to extend Internet access to many rural residential areas currently unserved or underserved. Fixed wireless has demonstrated the ability to increase both its quality of service (which has been weak in some areas) and connection speeds. Kentucky SBI data also shows fixed wireless technology as having the fastest growth in 2012.
- Mobile wireless is beginning to offer a broader range of Internet services over 4G networks, which may meet the needs of some households that are currently unserved or underserved.
- As seen in the GRADD public-private partnership (as well as many other communities across the US), there is both potential and interest in collaboration between communities and services providers. In some cases this can extend to collaboration between service providers.
- Provider interest and participation during the North Region IPA and FPA workshops, and successful community and regional Provider engagement strategies regionally and nationally show the potential for greater provider involvement utilizing different technologies.

Threats

- Residents in unserved communities may lose access to public and private services that increasingly are available only online.
- Ongoing regional, national and global competition will erode the economic base of those communities without competitive broadband.
- The weak and uncertain national and global economies make investment decisions more difficult, as future revenue streams become more uncertain.
- Fiscal constraints on local government are anticipated to last for an extended period, limiting their capacity to initiate and support broadband initiatives.
- Providing Internet infrastructure to those areas with the best business case will make the remaining areas increasingly less economically attractive for last mile investments.

7. Objectives and Recommendations

Building on the core principles outlined in Section 3, the Commonwealth of Kentucky has the following high level goals in relation to broadband:

- a) Broadband Internet will enhance the productivity, skills, mobility, and employment opportunities for residents of Kentucky;
- b) Access and digital inclusion will be achieved for all citizens and businesses.

This planning document is designed to assist the Commonwealth with the implementation of these goals for the North Region (Carroll, Henry, Gallatin, Oldham, Owen, and Trimble Counties).

To bring about deliberate and planned change by government or a group of citizens, it is important to base their efforts on a sound understanding of their objectives and how they can best bring about the desired changes. This document sets out a process to inform communities and regions of initiatives to improve broadband access.

In pursuing change, this Broadband plan sets out recommendations with strategies that build on the principles set out in Section 3. Two important elements that emerge from these principles are:

- Broadband initiatives should recognize the complementary roles of the market (consumers and providers), communities, and local governments; and,
- Priority should be given to areas where the digital divide is evident in access, adoption and use of the Internet. Specifically, priority should be given to “Unserved” and “Underserved” areas.

The principals, elements and supporting information described in this document serve as the fundamental rationale for the broadband plan. The three objectives addressed include:

- 1) Development of the **leadership and institutional capacity** needed to initiate and sustain broadband efforts at the local or regional level
- 2) Enabling nationally competitive broadband for commercial enterprises along the I-71 Corridor
- 3) Improving availability of broadband in rural residential areas

The first issue that needs to be addressed in terms of achieving these goals is the uncertainty over the level of financial and non-financial resources available to implement this plan and its recommendations. With a tight fiscal situation and declining broadband stimulus funding, ***the first strategic direction set out in this plan is the setting of objectives and recommendations that can be scaled to reflect the availability of funds, energy, and commitment. For each of the strategic objectives, this plan sets out recommendations that allow regional stakeholders to adapt the plan to the resources available.***

Addressing the issue of resource availability reduces a significant risk that the objectives, recommendations and supporting strategies outlined in this plan will not be implemented. By adopting a strategy that allows for varying levels of activity, there is a greater likelihood that the recommendations

in this plan will be implemented. Additionally, achieving an initial level of success can help to build momentum for the long term achievement of the objectives set out in this plan.

- The **Recommendations** in Section 7 have been organized into three categories:
- **Initial:** Related to project initiation and intended to be completed over the first 1 to 2 months.
 - **Short-term:** Mobilize resources for implementing the project, including: financial, leadership, and partnerships. These recommendations often include ongoing actions, though their initial phase should be completed in the first four months of the project.
 - **Medium-Term:** These involve “on-the-ground” implementation of the plan’s strategies and would typically occur after the 4th month of project initiation, some may be subject to obtaining the required resources, which may need additional time. The activities covered by these recommendations do not have a completion date, since many of the activities are expected to be ongoing.

Figure 1: Example of Implementation Timeline for Recommendations in Section 7

| Recommendations | Approximate Recommendations Timeline | | | | | Project Duration |
|---------------------|--------------------------------------|--------------------------------|--------------------------------|------------------------------|-----------------------------|------------------|
| | Month 1 | Month 2 | Month 3 | Month 4 | Month 5 | |
| Objective 1: | | | | | | |
| Initial | Commence at 45-60 Days or Less | | Some Require Ongoing Effort | | | |
| Short Term | | Commence at 2-4 Months or Less | | Some Require Ongoing Effort | | |
| Medium Term | | | Commence at 4 Months or Less | | | |
| Objective 2: | | | | | | |
| Initial | | Commence at 1-3 Months or Less | | Some Require Ongoing Effort | | |
| Short Term | | | Commence at 3-5 Months or Less | | Some Require Ongoing Effort | |
| Medium Term | | | | Commence at 4 Months or Less | | |
| Objective 3: | | | | | | |
| Initial | | Commence at 1-3 Months or Less | | Some Require Ongoing Effort | | |
| Short Term | | | Commence at 3-5 Months or Less | | Some Require Ongoing Effort | |
| Medium Term | | | | Commence at 4 Months or Less | | |

The detailed recommendations are found below in sub-sections: 7.1 and 7.2.

7.1 Recommendations for Building Local and Regional Leadership and Capacity

The strategic framework presented in the document relies on communities and regional entities to provide initiative in addressing the digital divide in their area. In rural areas, lack of capacity and leadership has the potential to limit the effectiveness of a community-based approach. Consequently, ***a strategic objective for adequate rural broadband service is the development of motivated leadership and institutional capacity for broadband initiatives.***

In the North Region project area, the Area Development Districts have identified themselves as leaders with the organizational capacity to manage the broadband initiative in their region. In addition, **Kentucky Connected** is a regional body that is willing to provide leadership on the issue of nationally competitive broadband along that section of the I-71 Corridor within the project area. The ADDs and Kentucky Connected bring the following abilities to the broadband initiative:

- Organizational structures and networks of elected officials and regional stakeholders
- Local knowledge of the area and its priorities
- Ability to work at the community level to identify unserved and underserved households and commercial areas at the street level

During the final development stage of this plan the KC-ADD requested the establishment of a regional broadband council under the auspices of the Area Development Districts. This issue will be considered by the Office of Broadband Outreach and Development after the Project Area plans are submitted.

In addition to establishing leadership, there is broad agreement that “local champions” are a critical component for the success of broadband initiatives. This plan recommends ***establishment of a broadband leadership and support program for local communities within the project area.*** It is increasingly rare for local government leaders to be unaware or uninterested in the desirability of having good Internet access throughout their jurisdiction. However, interest and awareness has frequently not translated into action in communities where financial resources are constrained, technical knowledge is missing, and leadership is in short supply.

Important elements of leadership and capacity development at the community level include:

- **Recruitment of individuals** with the interest, energy, and time needed to provide leadership. Leaders do not need to be people with technical skills, but should be individuals with the motivation and skills to take initiative and engage their community.
- **Empowerment of leaders** by providing official sanction and support from elected officials and key community organizations.
- **A mechanism for accountability** for leaders back to organizations providing support and sanction.

- **Educational and learning opportunities** for leadership so they can acquire the knowledge and skills for developing goals, actions and tasks related to the digital divide in their area.
- **Institutional support** from organizations with the capacity for organizing meetings, ensuring effective communications, and providing logistical support.

Finding and developing leadership at the local level can include key individuals, local stakeholders or stakeholder organizations willing to take on initiating and maintaining local broadband efforts. *In practice, a mix of key individuals and local institutions is often the most effective form of leadership.*

Recommendations for Leadership Development

Initial Recommendations:

- a) Establish a regional body to promote and recruit community leadership for broadband availability, while recognizing the role of Kentucky Connected in facilitating broadband infrastructure along the section of I-71 Corridor within the project area.
- b) Actively research and access viable funding sources for the project and sustainable broadband planning and leadership.
- c) Commence regional efforts to identify and recruit individuals and organizations at the community level willing to take on leadership roles for broadband availability in the project area. This effort can be carried out through proactive telephone and email survey at the local government level, and with major stakeholders in the project area or greater region.
- d) Provide orientation sessions to individual and organization leadership to learn about Broadband, the available resources and how they can improve broadband availability and/or enhance Broadband opportunities in their community.
- e) Develop tactics that fully leverage State Broadband initiatives.
- f) Establish a sub-committee of Broadband Providers.

Medium to Long-term Objectives: In addition to the above:

- g) Organize a series of webinars or face-to-face workshops to assist local community leaders in the project area in developing local broadband planning and outreach priorities.
- h) Facilitate a peer-to-peer support group among community leadership;
- i) Provide technical assistance on issues related to improving broadband availability. This component is critical to empowering local communities and their leaders and provides community leaders engaged in broadband with a mechanism for accessing local and regional individuals with technical skills and experience in facilitating broadband availability. As communities engage in broadband initiatives, they will encounter issues requiring expertise. Access to knowledgeable individuals, as mentors or paid consultants and a mechanism that facilitates this process will be an important strategy to meeting this need.

Given that many rural communities face the shared challenge of developing and supporting local leadership, it is also ***recommended that active and ongoing outreach to state-wide and regional organizations with complementing objectives be undertaken to explore collaborative opportunities***

through funding or in-kind contribution. Several agencies of Commonwealth government, industry groups and service organizations are potentially the groups to be targeted.

Checklist for Developing Community Leadership

Individual leadership

- Community leaders and elected officials understanding benefits and impacts of broadband
- At least three committed leaders
- Leaders that have the influence to enlist community support
- Leaders committed to obtaining the resources for implementation.

Organizational leadership and capacity

- One or more lead organizations have been identified
- The lead organization(s) are willing to develop partnerships for implementation and operation
- Personnel within lead organization are identified and available to provide leadership and support.

Shared Vision: Leadership (individual and organizational) has a shared vision of the broadband initiative;

Community support:

- Benefits of broadband are understood and supported by local businesses and key organizations
- There has been community engagement on the benefits of broadband and in the level of support for a broadband initiative.

7.2 Recommendations for Broadband Availability

Communities in the North Region project area that have less than adequate Internet services face significant barriers in overcoming this digital divide. Nonetheless, communities in the project area have the potential to develop the leadership and commitment necessary to achieve the broadband they need for their residents, businesses, and community anchor institutions.

In the North Kentucky project area, the priorities are: enabling broadband availability to rural residential areas without broadband; and, enabling nationally competitive broadband to commercial areas along the I-71 Corridor for community and economic development.

This plan divides the project area’s recommendations into two distinct efforts: a regional initiative to improve broadband in commercial areas along that section of the I-71 Corridor within the project area; and, a separate initiative to encourage and support locally based efforts to expand rural residential broadband. As these two distinct initiatives evolve, there will need to be close coordination in order to develop synergies. Some of the objectives of one group may be enabled or facilitated by the other initiative. However, their respective objectives and processes should remain distinct for the time being. The issue of coordination and identifying synergies applies to all broadband infrastructure initiatives in the project area. Regional leadership should consider possibilities for combining separate initiatives into a larger regional effort for designing and managing networks and the purchasing of services.

7.2.1 Enabling Nationally Competitive Broadband for Commercial Enterprises along the I-71 Corridor

The desire to attain nationally competitive broadband services in commercial areas along the I-71 Corridor is a priority. ***The North Region Working Group has identified Kentucky Connected as a body that will be responsible for developing a leadership group on this initiative. This group may seek to recruit additional individuals, organizations or businesses to expand its leadership base, in a manner consistent with the recommendations for developing leadership (Section 7.1).***

Many of the strategies and activities needed to address the inadequacies of current broadband services to commercial areas are covered in Appendix I, which provide a detailed process for improving broadband at a local or regional level. ***It is recommended that the leadership group headed by Kentucky Connected develop its detailed work plan by drawing on this process.***

Prior to developing a detailed work plan, the group should determine the level of fragmentation or concentration of existing and potential demand for advanced Internet services along the I-71 corridor. This task is critical in understanding the level of “effective demand”, which forms a critical part of any business plan for enhancing broadband services to these areas. Understanding the geographic footprint of effective demand, as well as the disparity between effective demand and current broadband services, are key steps in the preparation phase described in Appendix I. Completion of this

task will also help identify the potential for aggregating demand by geographic area and initiating discussions with Internet Service Providers that can potentially serve that area.

The following are the recommendations for addressing availability to achieve nationally competitive broadband in commercial areas:

Initial Recommendation:

- a) Determine standards for nationally competitive broadband, as they would apply to the I-71 Corridor. An initial step in defining these standards should include identifying the characteristics of existing and projected broadband services in the areas in and around Louisville and Cincinnati. This would include communication to regional Broadband providers to research their plans to expand their Broadband infrastructure over the next 2/4/6 years, as well as contacts within certain institutions or academia who may have national and regional knowledge to assist in developing targets for broadband services along the I-71 Corridor.
- b) Leverage the Broadband Provider sub-committee and regularly meet to discuss availability issues in the project area, to solicit on-going input from the group (Recommendations **c** and **d** below), and to begin broadband-specific collaboration with project leadership to improve communication and find ways to collectively improve availability.

Short-Term Recommendations:

- c) Identify areas of fragmentation and concentration of existing and potential demand for advanced Internet services along the I-71 Corridor. Actively aggregate this demand as a key source of information for project leadership, stakeholders, and the regional Provider community. This step will include thoroughly assessing existing and potential commercial locations in the project area, with specific criteria and a template to “inventory” all input in a consistent manner – to build a database and periodically update and grow it for use among all participants in the project area.
- d) Based on the findings of the assessment described above, develop actions and tactics that build on the process and activities laid out in Appendix I. The actions should allow for funding and other project contingencies.

Key variables in tailoring the plan to available resources should include: *use of a “prototype” site to demonstrate this approach; building a “catalog” of commercial sites with “upgrade” potential; and site prioritization requiring the least capital outlay and/or the least upgrade difficulty.

7.2.2 Improving Availability of Broadband in Rural Residential Areas

The issue of poor or no Internet service in rural residential areas is highly fragmented in the North Kentucky project area. Establishing a regional approach to enable local leaders to address these needs is an effective way to move rural Broadband efforts forward in the project area. ***This plan recommends a process whereby communities in the project area take responsibility for proactively identifying,***

finding, and compiling detailed information about unserved and underserved areas at the street level that addresses their community’s needs. The local efforts should be supported by the regional body with outreach, education and support.

Later in Appendix I is a detailed outline of the key opportunities and requirements facing local communities. It is recommended that communities adapt this process to determine subsequent tasks and choices. As communities move toward implementing specific strategies, they may find that initial choices need to be re-assessed.

If the overall strategy is based on local responsibility and leadership, there still remains significant scope for regional Work Group and stakeholder efforts to support these local initiatives to expand broadband availability. ***The recommendations below can be combined with or in addition to the steps outlined in the section on leadership.***

Initial Recommendations:

- a) Develop and circulate an information package among local communities that identifies the resources and opportunities available for improving broadband availability at the local level;
- b) Circulate, promote and leverage the “eLearning Module” on community approaches to improving broadband developed by the Office of Broadband Outreach and Development.
- c) Use regularly planned events for local governments to promote the ideas and materials available in this plan and on the eLearning website.
- d) Leverage the Broadband Provider sub-committee and regularly meet to discuss availability issues in the project area, solicit on-going input from the group on their information package (Recommendation a), and to begin broadband-specific collaboration among project leadership and Providers to improve communication and find ways to collectively improve availability.

Medium-Term Recommendations:

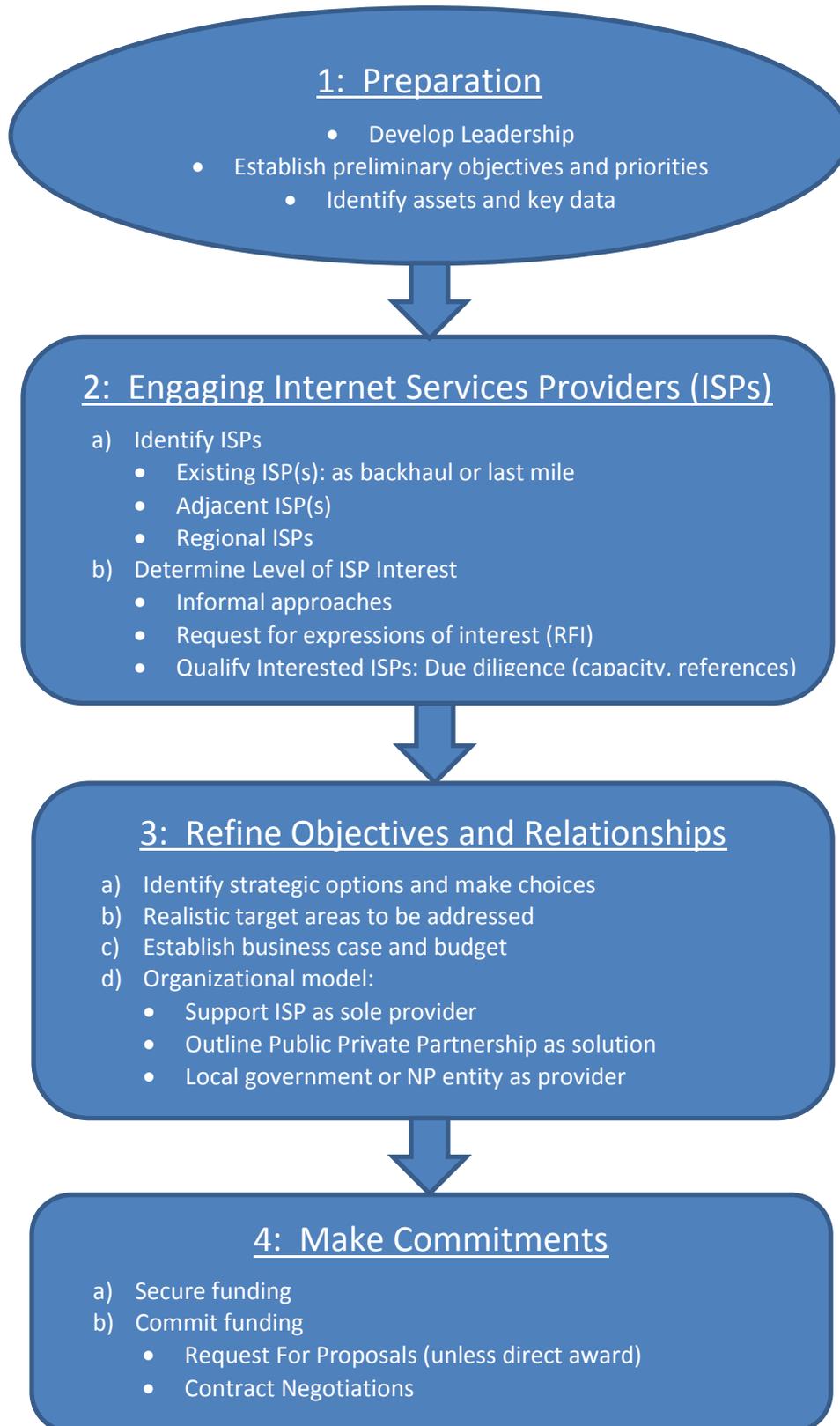
- e) Building on the efforts identified above, develop and expand regional approaches to Local Internet Expansion, bringing together communities that undertake local broadband availability initiatives. This would be a collaborative effort based on a shared process, in tandem with community work on local project initiatives and would include additional regional or Statewide Providers. Include a process for communities to share information and resources, active mutual aid or peer support, and technical assistance as noted in the section on leadership.

In Appendix 1 detailed information is provided about the process and tasks for local communities to use for expanding broadband services in rural residential areas. This includes basic starting points for consideration prior to commencing a community effort.

7.2.3 Stages and Tasks for the Internet Access Initiative

The diagram on the following page is a visual representation of the stages and tasks that communities should typically follow during an Internet access initiative. The steps and tasks identified are explored in greater detail in Appendix I. The Office of Broadband Outreach and Development (OBOD) has also created an online “eLearning” module that addresses local broadband availability. The module is available on the website noted below and includes a case study of the GRADD project:

<http://finance.ky.gov/initiatives/broadband/pages/default.aspx> .



8. Action Plan for Broadband in North Kentucky Project Area

The action plan components included in this section are preliminary. They begin to outline the tasks, timelines, and responsibilities reflected in the recommendations in Section 7. It is expected that this outline will be adjusted with more additional detail as the plan is implemented, to reflect the availability of resources and with more information being developed for the work required for implementation.

Objective 1: Build Local and Regional Leadership and Capacity

| Component <small>(with Section 7 Reference Number)</small> | | What | Initial Leadership | Other Stakeholders and Local Leadership | Begin Month | Outcome |
|---|---|---|---|---|----------------|---|
| 1a | Establish Regional Lead Body | Recruit & confirm involvement and level of commitment | KIPDA, NKADD, Kentucky Connected | | 1 | Establish committees and subcommittees |
| 1b | Secure Funding Sources | Approach potential funders | KIPDA, NKADD, Kentucky Connected, work groups | | 2 (ongoing) | Submit funding applications, research others |
| 1c | Expand leadership (Community Level) | Recruit new community leaders & stakeholders | KIPDA, NKADD, Kentucky Connected, work groups | K – 12 Superintendents & principals; commercial property owners; technical college; members outside of government | 1,2 | Leaders with focus on rural residential and commercial broadband, as well as economic development |
| 1d | Orientation Sessions | Provide orientation sessions – for individual & organization leadership | KIPDA, NKADD, Kentucky Connected, work groups | K–12 Superintendents & principals; post-secondary institutions, non-government stakeholders | 2 | At least two webinar or face-to-face orientation session |
| 1e | Tactical develop. to leverage State initiatives | Develop tactics that fully leverage State Broadband initiatives | KIPDA, NKADD, Kentucky Connected, work groups | Local government or business contact w/PR skills and project interest | 2 | *e-Link to appropriate state web sites *Connect/coordinate with state on PR progress reporting |



| | | | | | | |
|----|---|---|---|---|----------------------|---|
| 1f | Establish Provider sub-Committee | Build partner relationships and problem solving approach | KIPDA, NKADD, Kentucky Connected | Project area providers and utilities | 1,2 | Group becomes an input source on availability gaps in the project area |
| 1g | Organize a series of webinars or face-to-face workshops | Raise awareness and support local community leaders in developing local broadband planning and outreach | KIPDA, NKADD, Kentucky Connected, work groups | | Subject to resources | Community oriented workshops and webinars |
| 1h | Establish peer support | Facilitate peer support for community leadership | KIPDA, NKADD, Kentucky Connected, work groups | Technical college, commercial business, Local Gov., tech service providers , BB Providers | Subject to resources | Functioning community leadership peer group |
| 1i | Provide technical assistance program | Provide community leaders with access to resources, technical skills and experience | KIPDA, NKADD, Kentucky Connected, work groups | Technical college, commercial business, local Gov., tech service providers , BB Providers | Subject to resources | Technical assistance program provides expertise and education to community leaders and stakeholders |

Objective 2: Enabling nationally competitive broadband for commercial enterprises along the I-71 Corridor

| | Component | What | Who | Other Stakeholders & Local Leadership | Begin (Month) | Outcome |
|----|--|--|---|---|-------------------------------------|--|
| 2a | Determine standards for “nationally competitive broadband” | Research other regions | Working group, Kentucky Connected | Broadband service providers, economic development agencies, other institutions and academia (researchers) | 2 to 3 | Definition of “nationally competitive broadband” as applied to the I-71 Corridor |
| 2b | Leverage the Broadband Provider sub-committee | Leverage sub-committee: *regularly meet *discuss availability issues *solicit on-going input | KIPDA, NKADD, Representative *Provider-appointed Leader | Providers with service in project area and other regional providers | 2 to 3 ongoing Frequency TBD | *Input on fragmentation and demand aggregation; *collaboration on gaps *review and share SBI coverage data and State/Nationwide trends |
| 2c | Determine fragmentation or concentration of demand | Conduct survey of commercial areas | Working group, Kentucky Connected | Education sector – students | 2 to 4 | Documentation of current and future “effective” demand relative to supply |



| | | | | | | |
|----|--|--|-----------------------------------|--|---|--|
| 2d | Develop action plan with contingencies based on level of resources | * Establish target areas * Establish one or two “pilot” areas within project area | Working group, Kentucky Connected | | 4 | *List of target areas, together with demand/supply data. * Work plan. |
|----|--|--|-----------------------------------|--|---|--|

Objective 3: Improving Broadband Availability in Residential Areas

| Component <small>(with Section 7 Reference Number)</small> | | What | Initial Leadership | Other Stakeholders & Local Leadership | Begin (Month) | Outcome |
|---|--|---|---|--|---|--|
| 3a | Develop and circulate information package | Agree on design and approach to information package | KIPDA, NKADD, work group | Providers, Local Govt., GIS person, Chambers | 2-3 | Agreement on content, packaging, and points of distribution at communities in project area. |
| | | Produce and distribute package | KIPDA, NKADD, work group | Local media, education sector. | 2 & ongoing | Package sent to local governments, officials, and stakeholders. |
| 3b | Promote & leverage eLearning modules | Promote eLearning & outreach activities: Webinars; presentations; | KIPDA, NKADD, & Community Leadership | Local media, education sector. | 3 - 4 & ongoing | Participation of interested individuals and stakeholders; identification of local projects. |
| 3c | Regularly planned events | Promote/support local broadband availability initiatives, ideas, materials (see tech assistance 1i: Leadership). | KIPDA, NKADD, & Community Leadership | Muni and county gov; utilities and Providers. | Subject to resources | Better Broadband info on services to unserved or underserved households in the project area. |
| 3d | Leverage the Broadband Provider sub-committee | Leverage sub-committee: *regularly meet *discuss availability issues *solicit on-going input *input on information package | KIPDA, NKADD, Representative *Provider-appointed Leader | Providers with service in project area and others from region. | 2 & ongoing Frequency TBD | *Discuss availability issues *Solicit input on information package * Begin collaboration on avail. Gaps *Review and share SBI coverage data and trends in State/Nationwide |
| 3e | Expand participation of local internet initiatives to more communities | Build on initial project work, grow the number of participating communities, info sharing/collaboration., peer support, technical assistance. | KIPDA, NKADD, working group. | Local Gov; K-12 superintendents & principals; | 3 - 4 & ongoing (Subject to resources) | More community participation with interested individuals and stakeholders; identify more/new local projects. |

9. Metrics for Tracking Progress and Impacts

An important part of any plan is developing a means to track progress and determine impacts. Without the ability to track progress, plans can go off track without stakeholders knowing why or when. Tracking progress enables project leaders to keep on track, identify issues, and adjust the plan accordingly, while also providing the necessary accountability to OBOD for federal grant reporting.

The three **Objectives** are tied to the **Recommendations** (Section 7) which are associated with Action Plan **Components** (Section 8).

1. **Building local and regional leadership & capacity**
2. **Enabling nationally competitive broadband in Commercial Areas along the I-71 Corridor**
3. **Improving broadband availability in rural residential areas**

| Building Local and Regional Leadership & Capacity | | |
|--|--|---|
| Metric: | | Data: |
| 1a | Lead regional body is established and committees defined | <ul style="list-style-type: none"> • Creation of organizational parameters that define structure, mandate, accountability and membership. • Endorsement of group parameters is affirmed by key stakeholders. |
| 1b | Secure Funding Sources | <ul style="list-style-type: none"> • Document names, contacts status of funders approached, • Status of applications submitted • Details/terms/conditions of funds secured, and status funds to be distributed |
| 1c | Recruited key stakeholders / individuals for community leadership group(s) | <ul style="list-style-type: none"> • Membership of targeted leadership group identified, invited • New individuals and stakeholders recruited to the Lead Body |
| 1d | Delivered orientation sessions | <ul style="list-style-type: none"> • Number of presentations and participants (# TBD) |
| 1e | Developed tactics to leverage State Broadband Initiatives | <ul style="list-style-type: none"> • Submitted & approved tactical plan |
| 1f | Established Provider sub-Committee | <ul style="list-style-type: none"> • Document participants, meeting frequency & issues addressed • Over time, document solution collaboration, opportunities to fill availability gaps through partnership |
| 1g | Organized/ implemented webinars or face-to-face workshops | <ul style="list-style-type: none"> • Document number of presentations, community locations, participants, ongoing meetings scheduled in project area (# TBD) |



| Building Local and Regional Leadership & Capacity | | |
|---|---|--|
| <i>Metric:</i> | | <i>Data:</i> |
| 1h & i | Established peer support and technical assistance program | <ul style="list-style-type: none"> Document design of program, frequency of use, issues addressed, recruitment of volunteer or contractor presenters, and assess participant program impact |

| Enabling Nationally Competitive Broadband in Commercial Areas along the I-71 Corridor | | |
|---|---|---|
| <i>Metric:</i> | | <i>Data:</i> |
| 2a | Defined standards for “nationally competitive broadband” | Written statement on how to define standard of “nationally competitive broadband” |
| 2b | Leveraging Broadband Provider sub-committee and regularly meet and discuss availability issues in project area, solicit on-going input from the group on fragmentation and demand aggregation, begin broadband-specific collaboration among project leadership and Providers to improve communication, find ways to collectively improve availability | <ul style="list-style-type: none"> Document meetings, attendees, provider attendees, info exchanged, etc. # of availability gaps by commercial area or industrial park Identify/document competitive dynamics of provider-attendees Document provider input on concept of “collaborative” work w/providers Document and develop availability “package” (for target areas projects) and collective provider “work plan” for problem solving |
| 2c | Determination of fragmentation or concentration of demand | Databases with street level data, identifying geographic patterns of target areas and levels of existing and potential demand, as well as current level of service and broadband infrastructure |
| 2d | Action plan with contingencies based on level of resources | Written plan |

| Improving Broadband Availability in Rural Residential Areas | | |
|---|--|--|
| <i>Metric:</i> | | <i>Data:</i> |
| 3a (1) | Completed broadband availability information kit | <ul style="list-style-type: none"> Finished kit content and subsequent updated kit at periodic intervals. |
| 3a (2) | Distribution of information kit on broadband availability and public Internet access sites to local governments and stakeholders | <ul style="list-style-type: none"> Points of distribution, activity log related to community use and engagement Number of kits distributed, plus online tracking of access to kits (if online) (# TBD) Plan/prepare for v2 updates, timing, team contributors, data sources |



| Improving Broadband Availability in Rural Residential Areas | | |
|---|---|--|
| Metric: | | Data: |
| 3b | Circulation, promotion and leveraging the “eLearning Module” on community approaches to improving broadband developed by OBOD | <ul style="list-style-type: none"> • Number of presentations (# TBD) • Names of groups addressed • # of Participants, # Target Group Types, Leadership Interest, Project Interest |
| 3c | Use of regularly planned events for local governments to promote the ideas and materials available in this plan and on the eLearning website | <ul style="list-style-type: none"> • Number of presentations (# TBD) • Names of groups addressed • # of Participants, # Target Group Types, Leadership Interest, Project Interest |
| 3d | Leveraging Broadband Provider sub-committee and regularly meet and discuss availability issues in project area, solicit on-going input from the group on their information package (Recommendation 3a), begin broadband-specific collaboration among project leadership and Providers to improve communication, find ways to collectively improve availability. | <ul style="list-style-type: none"> • Document meetings, attendees, provider attendees, info exchanged, etc. • Document provider inputs on info package/overall use of package • # of availability gaps at the community level (areas w/community-based projects) • Identify/document competitive dynamics of provider-attendees • Document provider input on concept of “collaborative” work w/providers • Document and develop availability “package” (for areas w/community-based projects) and collective provider “work plan” for problem solving. |
| 3e | Development and expansion of regional approaches to expanding the number of participating communities through info sharing/collaboration, peer support, and technical assistance | <ul style="list-style-type: none"> • # of new community initiatives launched • # and type of groups involved, total team involved • # of info “bulletins” and communication activity (#TBD) • # of tech assistance events or responses “logged” by lead group (#TBD) |



Impact Metrics

Impact Metrics measure overall benefit on Internet access in the project area. This is important to OBOD for NTIA federal grant reporting purposes and for other sponsor-funders who may become part of the effort as the project progresses. Measuring and tracking impacts allows project participants to determine whether their efforts are having the anticipated effect. For funders and sponsors, impact tracking provides critical input into future policy directions and budget allocations.

➤ **Improved access to broadband infrastructure (both rural residential and commercial)**

| Improved Access to Broadband Infrastructure | | Data |
|---|--|--|
| 1 | # of POPs ¹ and connected areas | Number of POP's – *new *expanded hrs. *expanded services *communities served in project area |
| 2 | Connectivity characteristics of services | Documented increases in *speed, *reliability, *service redundancy, *new services, *service types |
| 3 | # of new businesses served (service available) | Stat's on Broadband service coverage (e.g. premises passed or within service area) |
| 4 | # households served (service available) | Stats on broadband service coverage (e.g. households passed or within serv. area) |
| 5 | # of anchor institutions added or upgraded (by sector) | Number and type of new anchor institutions subscribing to broadband service |

1: **POP** – Point of Presence

Impact Metrics may need to shift or adjust when the detailed action plan is finalized, or if any material change is made to the plan when the project commences in the region.

Appendix I - Steps for Local Planning for Broadband Availability

The next few pages provide a detailed review of the process and tasks for local communities that want to expand broadband services in rural residential areas. It is useful to begin with some basic starting points.

- ✓ ***Begin with needs and goals, rather than solutions*** -- Local and regional initiatives should not begin by assuming what the eventual Internet solution will look like, the appropriate scale of “build out”, type of technology, type of ISP, or what the appropriate role of the local government should be. Instead, initiatives should address specific needs and the goals in the project area that ultimately lead to better solutions.
- ✓ ***Identify the specific needs and locations of the fragmented areas.*** Local needs and goals need to be supported with actual information on-the-ground that identifies problem areas and certain local asset information on a map, as well as aggregating the “demand potential” for underserved and unserved populations. This can become powerful information to empower and inform local leaders, and help facilitate ISP partnerships.
- ✓ ***Include, inform, and attract local leadership.*** Local elected officials, economic development organizations, small business, and other active energetic leaders in the community. The educational sector has often played an important role in providing leadership and a clear rationale for making local broadband initiatives a priority. The educational sector has particular value with access to students who could be involved in documenting current and potential Internet service and demand.
- ✓ ***Consider Internet Service Providers (ISPs) as partners.*** A major point of feedback from Providers is that communities and local governments often see them as an “outsider” or only as a potential source of revenues, rather than as a partner in achieving community goals. Providers are a lot more willing to spend time exploring options with friendly communities than with those who place obstacles in their path. While a community may or may not find an attractive ISP to partner with, they should start by considering potential ISP partners. Facilitating a consultative relationship with ISP’s as partners opens up an essential communication channel for the longer term of this project and enables the Broadband team to tap into a valuable resource of information on technology, equipment, and network maintenance & expertise – *the business of broadband.*

Step 1: Preparation

- a. ***Develop leadership and capacity:*** This task is dealt with in Section 7.1. It is recommended that the local government or entity *not try at this stage* to define its specific role in delivering broadband access. The role of the local government should emerge from the process of exploring options.

- b. **Establish preliminary objectives and priorities:** A community's objectives and priorities regarding broadband will likely be in constant flux as the broadband infrastructure around them evolves. In past years, communities were likely to consider ambitious and larger scale initiatives, in part due to the availability of grants from federal and in-state sources and in part due the significant portions of their area that were unserved or underserved. However, in many cases unserved or underserved areas are shrinking, resulting in a smaller group of target users. As a result, the scale of initiative needed to address unmet needs may be smaller than in the past and require fewer resources. In addition, significant improvement to the quality and speeds of some technologies (notably fixed wireless) provides for options that may not have been attractive in the past.

Given these factors, an important early step in the planning process is defining the required scope of the Internet infrastructure initiative. Communities need to define the target or potential broadband users in specific terms that can be measured and mapped. Similarly, the level of broadband service desired for each group of users' needs to be defined so that it can become part of a cost / benefit and business case analysis.⁷

- c. **Collect important information and data** that is critical to engaging potential ISP partners and assessing options. The list of data to be collected during this step can be extensive, though the effort is not necessarily difficult:
- **Target population or organization(s):** location (topography), number and age of households (rural residential), density, and income/budget.
 - **Vertical Assets: Towers** – if municipally owned, lease payments can be reduced or suspended to spur deployment. **High Structures** – silos, water tanks, buildings for placement of wireless equipment.
 - **Pole access:** pole owner, pole type, attachment capacity, cost.
 - **Rights of Way** – can be used to expedite/reduce cost of conduit placement
 - **Ongoing or Pending Capital Projects** – water, road construction, new subdivisions, main street revitalization, etc.
 - **Municipally Owned Utilities** - assets, customer base and back office operations can be leveraged for partnerships
 - **Land** – that can be used for tower construction/locating points of presence, etc.
 - **Ongoing/Planned First Responder Communication Upgrades** – many of these projects involve the construction of infrastructure and upgraded communication services. If activities can be aligned it is often possible to achieve economies of scale.
 - **Existing Vendor Relationships** – existing relationships can often be leveraged to provide enhanced and expanded services.

⁷ At its most basic level, an effective demand assessment categorizes the location and type of user, information on current broadband services (cost/type), types and bandwidth requirements of applications currently in use and applications being considered (and their bandwidth requirements).

- **Existing Mapping (GIS) Resources** – to provide a visual representation of community attributes that can be used in the planning process, including prospective partners.
- d. **Become an attractive partner**
- Develop leadership within local government that supports a corporate culture that understands and enables partnerships that assist the community in achieving its defined goals and objectives;
 - Ensure availability of Land Use Planning and Zoning documents;
 - Review zoning requirements for impediments to broadband infrastructure;
 - Consider an expedited permitting processes for installation of broadband infrastructure;
 - Review fees and charges that may become an unnecessary barrier.
- e. **Communication to community:** keeping the community informed can be important in building public support for the local initiative. Communication should start as soon as possible and provide local residents and businesses with periodic updates. The communication process can prevent inaccurate information about the initiative from circulating or gaining traction. Most importantly, experience with other communities shows that good public communication builds local support and assists in the start-up up phase, especially in terms of obtaining high take-up rates of new Internet services.
- f. Preparation includes developing a method of tracking progress so progress can be measured and outstanding tasks and timelines kept in full view.

Through the preparation phase, it is important that the community establish a sense of the scale of the initiative being considered. Some broadband infrastructures may be relatively modest in scope: reaching a hundred or more rural households; or, the initiative may be very much more ambitious, such as bringing ultra-fast broadband (usually fiber) to a larger geographic area with many hundreds or even thousands of households. ***The level of preparation should reflect the anticipated scale of the project.***

Step 2: Engaging Internet Services Providers

At some point early in its community broadband planning, a community will need to engage with one or more Internet Service Providers. Initially this will be to identify the current and planned state of broadband infrastructure within and adjacent to the community. Eventually, the community will need assistance of ISPs, whether it is as the providers of new local services or for connections to the global Internet (middle-mile and backhaul).⁸

⁸ Wikipedia: “Backhaul generally refers to the side of the network that communicates with the global Internet, paid for at wholesale commercial access rates ... Sometimes [middle mile](#) networks exist between the customer's own (*network*) and those exchanges. This can be a local [WAN](#) or [WLAN](#) connection, for instance [Network New Hampshire Now](#) and [Maine Fiber Company](#) run [tariffed](#) public [dark fiber](#) networks as a backhaul alternative to

The following tasks outline the steps suggested in engaging ISPs. As each step is addressed, it has major implications for the remaining planning process. If an issue is effectively addressed at an early stage, some tasks will no longer be required. If a satisfactory outcome is not achieved, additional tasks will need to be undertaken.

a) Identify ISPs: ***In order to understand possible options it is recommended that communities identify current broadband services and infrastructure.*** Knowing where the closest “backhaul” or fiber-optic cable in or near one’s community is important in the planning and assessment process. ISPs can be classified in a couple of ways:

- By their retail service footprint: There will probably be one or more ISPs within the community. In addition, there may be ISPs that serve adjacent areas and may be interested in serving additional areas; lastly, there may be regional ISPs that may not be adjacent, but who have services not too distant from the target community and may be convinced to expand to the target area. Communities should identify all ISPs that fit one of these descriptions.
- By the type of service they sell: some ISPs may be focused exclusively on retail services (selling directly to the consumer). Other ISPs may also provide wholesale services to other ISPs.

In identifying ISPs, it is important to include fixed wireless providers (WISPs). While this sector is still maturing, there are an increasing number of WISPs that are very agile and provide services capable of high speeds and good quality. Mobile wireless, on the other hand, while a highly desirable service, at this point is not generally considered an alternative to a dedicated broadband service due to issues with reliability, costs and usage caps. Some of these limitations may be addressed in the near future. Satellite providers are not usually considered a preferred option due to issues with quality, cost, and technological limitations.

b) Determine Level of ISP Interest: ***once the range of ISPs that can potentially provide new or better broadband services has been established, it is recommended that communities begin the process of entering in exploratory discussions with one or more ISPs.*** Completing the previous steps will help community representatives in this engagement process by giving them a clear senses of purpose, information that allows them to convey specific objectives, an understanding of important broadband terminology, and a the ability to convey the idea that the community is a willing and attractive partner.

At this point, the community needs to decide if it wishes to undertake a formal or informal process. Some communities have begun the engagement process by issuing a formal Request for Expressions of Interest (RFIs). These can be more or less detailed. Their primary objective is to identify interested ISPs, as well as the range of options that these ISPs may be able to offer.

Generally it is preferred that the RFI not describe the technical solution desired, but rather should focus on the goals and outcomes. Allowing the ISPs to propose different solutions will provide the community with a fresh perspective on how its broadband goals may be achieved. The RFI should convey the information that the community has collected during the preparatory phase, together with a statement that the community is willing to consider a broad range of solutions and is willing consider assisting or partnering with the ISP in a variety of different ways.

Some communities have preferred to start the engagement process with an informal approach to one or more ISPs, usually ones that already provide Internet services to the area. In some cases, the approach may be made to a local utility that does not currently provide Internet services but has the capacity of doing so (e.g. a local or regional electrical utility or telephone cooperative). Depending on the level of interest expressed during the informal conversations, the community may choose to proceed with an RFI or alternatively to begin more detailed discussions with the interested ISP.

- c) Qualify Interested ISPs: ***regardless of whether an informal or formal process is used, the community should undertake due diligence of any ISP or utility that wishes to explore partnering with.*** Due diligence would typically include confirming the organizational, technological and financial capacity of the possible partner, as well as its track record for installing infrastructure and delivering quality services.

Step 3: Refine Objectives and Relationships

Once a community or region has completed the preparation phase and collected information through the ISP engagement process, the time should have arrived for making key decisions and developing concrete plans that have defined service areas, is cost effective and is achievable within available resources. There are a number of critical key steps in this process. These steps are not necessarily sequential. Completing the following steps may be a fluid process that shifts back and forth until a satisfactory solution has been developed.

- a) ***Review strategic options and set priorities:*** At this point, the options should be relatively clear, though the decisions still difficult. Usually there is trade-off between costs and benefits. Hard decisions need to be made on which priorities matter most. The most attractive technology may not be the most pragmatic and cost effective solution. Alternatively, a relatively small increase in project costs may open the doors to future development. Having a longer term vision should help in setting priorities and making choices. Is the community setting itself up for a longer term involvement in a comprehensive and ambitious approach to developing broadband in the area? Or, are market forces felt to be largely effective, with the community stepping in only on the margins?

- b) ***Establish a business case and estimate of resources and budget required:*** before any decisions can be finalized, a business case must be made for any investments made by the local government, even if the investment is limited to making public assets available to an ISP.
- Develop an analysis of the costs and benefits for any investments;
 - Ensure that any proposed service or infrastructure investment is financially sustainable and projected revenues will cover expenses. Are “take-up” rates realistic? Are there contingency plans for lower revenues or unexpected costs?
- c) ***Establish a partnership model:*** at this point it will probably be clear what the respective roles of local government, community institutions, and ISP will be. Nonetheless, these need to be carefully considered and articulated. While there are numerous options and variations in partnership arrangements, the most common would flow from the following:
- Community as facilitator of a service to be developed and managed by an ISP. This may include making community assets available for cost or for less than cost. This may also include becoming a long term purchaser of Internet services from the ISP (ensuring a revenue stream).
 - A public private partnership between a local government entity and an ISP. The local government may choose to subsidize the capital costs or build part of the infrastructure and lease it to the ISP. There are numerous other partnerships models. The best approach is to contact other local governments that have developed partnerships or are actively considering one.
 - Local government or local not-for-profit entity as provider: while this is the most ambitious approach, a number of communities have successfully gone down this road.
- d) ***Other considerations:***
- “Over-building” an existing ISPs infrastructure is very costly and may be unnecessary. There should be a clear strategic advantage for this option to be considered. Such a strategic consideration could include bringing in competition, better pricing and a level of broadband that may otherwise not be developed.
 - A different approach could consist of a modest extension or enhancement of the existing broadband infrastructure in the area. A community need not fix on high end solutions where more modest solutions may achieve its objectives.
 - Communities should look for opportunities to piggyback lower priorities that may be very achievable at low cost and effort within the primary arrangement. An example can be found in communities that have negotiated the “free” provision of Wi-Fi hot spots in return for ISP access to vertical assets owned by the community.
 - Demand Aggregation is a strategy for securing better or less expensive Internet services. Consolidating demand into a cluster of guaranteed contracts can also be used to attract ISPs or as a bargaining chip in negotiations. Demand aggregation opportunities vary greatly by community.

- To the extent that a community takes on formal responsibilities for provision of Internet Services, either within a partnership or as the sole provider, it is critical that a detailed plan be created for the operation and maintenance of the service and supporting infrastructure. This plan should lay out any ongoing responsibilities of all members within the partnership.
- Development of a marketing and communication plan can help generate both public support and (where appropriate) high levels of subscriptions (“take rate”). High take rates play an important role in generating initial cash flow as well as a financially sustainable broadband service.

Step 4: Make Commitments

Once a community or local government has decided on its course of action, the final steps of securing funding and negotiating contracts must be undertaken with due care.

- a) **Securing funding:** Funding may or may not be required to execute the planned Internet infrastructure project. In some communities, the facilitated process and access to public assets has been sufficient to entice an ISP to build the required infrastructure. To the extent that funding is required, a number of options exist:
 - **Aggregating existing demand and purchasing power in the form of guaranteed contracts** can be used as part of a long term financial arrangement with an ISP. This will require organizations to collaboratively commit budget allocations to multi-year contracts. The contract should be based on provision of specified services and service levels.
 - **Access grant opportunities:** granting programs for broadband are currently in flux. At a national level, stimulus funding for broadband is coming to a close. However, the Connect America Fund (<http://www.fcc.gov/document/connect-america-fund-1>) and Rural Utilities Service (<http://www.rurdev.usda.gov/RUSTelecomPrograms.html>) continue to provide federal grant opportunities. The Connect America Fund is still in its early stages and its rules are not yet settled. These funding sources may be attractive to larger projects, for established ISPs or for ISP’s with certain technologies. For smaller initiatives, the level of administration required by the funding sources may make them inappropriate. The evaluation of grant opportunities and other financing options should be one of the preparatory steps carried out by the leadership group.
 - **Funding mechanisms of Kentucky:** the Kentucky Infrastructure Authority (KIA) provides a mechanism for funding construction of local public works projects.
 - **Commit funding:** once funds have been secured, a process is required to commit any public spending directly on a broadband infrastructure project. The committing of public

funds must be done in a transparent, effective, and efficient manner. This document does not deal with this issue. Nonetheless, should public funds be required, the community must be ready to undertake either a Request for Proposals (RFP) or Direct Award. It may also require the skills to enter into complex contract negotiations with an ISP.

Appendix II: List of Resources

This section provides an inventory of financial resources available to stakeholders undertaking activities recommended in this plan. This list of resources will change over time as priorities, mandates, and budgets of funding organizations change. Stakeholders will need to update and supplement this resource list. It is highly recommended that stakeholder contact prospective funders to review funding availability, criteria, and timelines.

Warm

Local Government Economic Development Program (LGEDP) --

<http://dlg.ky.gov/grants/stategrants/coaldevelopment.htm> -- Provides grants of coal severance and processing tax revenues to coal-producing counties, commonly referred to as the Local Government Economic Development Fund (LGEDF), “to assist eligible counties in diversifying their local economies beyond coal production and meet other community development needs”

Kentucky Infrastructure Authority (KIA) – Infrastructure loan programs: <http://kia.ky.gov/loan/> --

Fund B: <http://kia.ky.gov/loan/fundb.htm> (Leg. Appropriation)

Fund C: <http://kia.ky.gov/loan/fundc.htm> (Bonds) – Application:

<http://kia.ky.gov/NR/ronlyres/B367C47F-F1F0-444F-A9B1-E3AF505A71B0/0/FundCApp090110.pdf>

USDA Farm-to-School Grant Program --

<http://www.grants.gov/search/search.do;jsessionid=grbyRpjYjpTFpY1f4TLlCm81whPlzb3x9Pp2qpBBZGJflLjJdyQ6!-804278280?mode=VIEWREVISIONS&revNum=0> (NOTE: Matching requirement)

“USDA anticipates awarding up to \$5 million in grant funding to support efforts that improve access to local foods in eligible schools”

U.S. Economic Development Agency –

Public Works and Economic Adjustment Assistance Programs

<http://www.grants.gov/search/announce.do;jsessionid=5mDyR3wWJRFN74fTPILk1BjqKjfy9LqmhVnfmRGKx1ymJ3BqQHd!286685741> ANNOUNCEMENT OF FEDERAL FUNDING OPPORTUNITY ...

EDA provides strategic investments that foster job creation and attract private investment to support development in economically distressed areas of the United States. Under this FFO, EDA solicits applications from both rural and urban areas to provide investments that support construction, non-construction, technical assistance, and revolving loan fund projects under EDA’s Public Works and Economic Adjustment Assistance programs. Grants made under these programs are designed to leverage existing regional assets to support the implementation of economic development strategies that advance new ideas and creative approaches to advance economic prosperity in distressed communities.

Worth Tracking --

US - DoD Injury Prevention, Physiological and Environmental Health Award (IPPEHA) --

<http://www.grants.gov/search/synopsis.do;jsessionid=N0GKRppGJQwphgwR2XwL5PvTjsQZSzph9qzMV6Pps11hmg5CHB!-804278280>

NOTE: This is NOT a specific grant for a Broadband initiative, but the **Telemedicine and Advanced Technology Research Center (TATRC)**, located at Fort Detrick, Maryland, is administering this grant. This group should be followed closely for applicable initiatives in the future.

Corporation for National and Community Service – (Grant \$5m)

School Turnaround AmeriCorps FY13

<http://www.grants.gov/search/School%20Turnaround%20AmeriCorps%202013%20Notice%20of%20Federal%20Funding%20Opportunity>

The mission of the Corporation for National and Community Service (CNCS) is to improve lives, strengthen communities, and foster civic participation through service and volunteering. CNCS—through its AmeriCorps and Senior Corps programs and the Social Innovation Fund—has helped to engage millions of citizens in meeting community and national challenges through service and volunteer action.

Appendix III: Contributors to this Plan

This Plan was developed over a ten month period by a team that included the Commonwealth of Kentucky Office of Broadband Outreach and Development (OBOD), the Project Area Working Group for North Kentucky, the Kentucky Council for Area Development Districts, Michael Baker Jr. Inc., and Strategic Networks Group.

In the North Kentucky region's project area, consisting of the Carroll, Henry, Gallatin, Oldham, Owen, and Trimble Counties, this regional planning process was initiated in May 2012 with the active involvement of the Area Development Districts as regional leaders. From May 2012 to February 2013, the planning process progressed through a series of conference calls and two stakeholder workshops in October 2012 and February 2013.

During this process a broad range of stakeholders throughout the three ADD regions were contacted about the Broadband planning initiative. Many were invited to provide input and participate in the two workshops. A list of organizations that were consulted as part of the development of this plan is available through the KC-ADD office.

Appendix IV - IPA Workshop Meeting Notes: North Region

October 29th, 2012

This document provides an overview of the issues discussed during a broadband planning workshop held in the North Region of Kentucky, focusing primarily on the I-71 Corridor within the KIPDA and Northern Kentucky Area Development Districts (including the counties of Oldham, Trimble, Carroll, Henry, Gallatin, Owen, excluding Jefferson County). The document concludes with an “Outcomes” summary that identifies the goals and objectives agreed to by the end of the workshop. This document draws on notes taken by NKADD, KIPDA, KCADD, Baker, and SNG staff.

Brian Kiser convened the meeting and introduced the project team members and working group members before asking attendees to introduce themselves around the room. Kiser provided a brief history of the inception of the Commonwealth Office of Broadband Outreach & Development, including its mission statement, goals, and current involvement in presenting to legislative bodies.

Kiser explained that the purpose of the planning process is to identify and engage stakeholders, identify the priorities of the region, and engage Internet services providers. He also summarized the challenges Kentucky faces in Broadband adoption and utilization. Having Broadband available to homes and businesses does not ensure it is being used effectively to improve the way people live and businesses work. At this juncture, the planning process turned to the ADDs and regional stakeholders to allow them to determine what goals and objectives for the region.

Lisa Cooper then presented the North Region Working Group’s Scope of Work (SOW) document. Cooper explained that as soon as the North Region’s boundaries were defined, NKADD and KIPDA wanted to address breaching the rural/urban gap in the six county area already identified by the newly-created I-71 Corridor Group. Because the area includes three counties from each ADD, both ADDs are equally invested in gaining broadband along this corridor. Cooper explained that the corridor is an ideal site for industrial recruitment; it already has roads, river, and rail. All the area needs is broadband to entice industrial investment in the area. At this juncture, the Working Group has enlisted the help of the stakeholders present to assist in designing an initiative that addresses the connectivity issues in along that corridor.

Bill Bates provided technology and trending information relating to regional broadband availability, project goals, changes in provider participation over the past two years, and data on users, usage, and uses. Derek Murphy then presented information relating to the regional survey data from March 2012. Murphy then informed the group that the goals for the day’s workshop would be creating a vision, goals and strategies, as well as action items for implementing an action plan.

Plenary discussions then ensued on the issue of local broadband availability. Those present confirmed that broadband generally is available in the towns but begins to deteriorate beyond those borders. A representative from Gallatin County noted that the only connectivity in the county is in the county seat.

Other elected officials confirmed that they know the map does not accurately reflect where broadband is available in their counties. Representatives from Carroll and Owen counties said they could obtain information down to a road level regarding broadband availability that would more accurately reflect the project area.

Steve Dale from the I-71 Corridor Group noted that while residential connectivity is an issue, there is a real need to pair up high-end broadband availability at the junctions of other infrastructure already in place. He agreed to work with the group at a later date to identify those potential locations.

The plenary session identified two main objectives for this planning process:

1. Create access to reliable broadband connections in currently un-served and underserved rural residential areas by focusing on provider-centered partnership for potential build-out;
2. Improve broadband service to businesses to enable them to compete at a global level.

The group broke for lunch and reconvened at 1 p.m., splitting into two breakout groups—one to address rural residential broadband availability and one to address world-class commercial broadband services.

With both breakout groups dealing with the issue of broadband infrastructure, there were many issues common to both groups. These included valuable criteria and attributes for Providers considering service expansion:

1. Population information at the county and local level, including potential broadband subscriber **density** in area -- Institutional, CAI's, Residential, Business, Gov.
2. Geography / Topology
3. Providers presently operating in the area
4. Technology options in the area
 - Cost/timing of fiber network expansion (a limiting factor)
 - Fixed-Wireless may likely provide a faster way to bring service in underserved areas
 - Understanding the “partnership potential” of an area – Facilitating the partnering between local governments, institutions or Providers
5. Land ownership, parcel boundary, business zoning or districts, ROW access -- location
6. Public / Private Structures
 - Public/Muni towers or water tanks -- Does muni-owned infrastructure have specific business and contract terms? Document business processes and contract terms.
 - Pole access -- Pole owner, Pole Type, Attachment capacity, Cost, Permitting/Licensing process, *Speed-of-attachment (bureaucracy)
 - Private-sector tower assets in the region
7. Government rules/requirements/regulations/constraints –
 - Thinking more in a broadband-centric way...
 - RFI / RFP: Value-based? Cost-based? Criteria defined? Is the decision/evaluation process defined, open and fair (People/Committee/Processes)?

World-Class Commercial Broadband Group

For the six-county area along the interstate corridor, there is a lack of knowledge surrounding the technology needed. The group was asked, “How do we determine what tomorrow’s technology will be?”

In a similar vein, the group was asked “what companies are looking for in relocating; will they only relocate to an area with existing availability or will they look at a location with a plan for infrastructure that can be tailored to the business’ needs?” The group needs to identify the trends in the existing economic development market.

A survey was suggested with industries similar to the ones they would be recruiting to see what they are currently using in terms of broadband and what they would look for when relocating. A separate survey of industries already in the counties could identify how much they paid for infrastructure for their operations and what they look for in a broadband connection?

Gallatin County Attorney Spike Wright suggesting the creation of business-friendly zones that interweave on a local level, possibly along the interstate exits.

When recruiting businesses, BB service is not always available for the businesses to come to the area. Businesses need to know BB will be available to locations they are considering moving into.

Specific sites can be identified for BB service needed to those locations.

The group was asked if they wanted to work with small businesses in the area to educate them on the benefits of broadband. The group agreed that doing so could not only benefit the small businesses in the area, but also increase the demand for broadband along the interstate, which would aid industrial recruitment efforts in the future.

Rural Residential Broadband Availability Group

1. Residential group objective: to get residential access to BB service in the 5 counties project area.
2. Carroll County schools need BB access for households for their kids, so they have BB at home for homework.
3. Each county needs a community champion, either individual or a group.
4. Fixed wireless needs about 10 customers per vertical asset to make in financially feasible, versus the previously mentioned 40 households per mile for wireline.
5. Fiber is about \$9,000 per mile to install.
6. Need a business case based on real numbers: population, costs, and probable revenues.
7. Gallatin County talked about what they have done in their county.
 - a. Initial goal was 75-80% population with BB coverage in first year.
 - b. The remainder 20% of population will have BB service in 3-4 years later.
 - c. They made a \$50,000 capital investment to go from 20% population coverage to 80% coverage.
 - d. They will get back their \$50,000 investment later.
8. Shelby Broadband invested >\$50,000 in Harrison County and got about 600 customers.

9. Schools have contracts with Windstream, but if they need more capacity, they can get it elsewhere if they choose. Maybe can be a core service to start projects in an area.
10. Need communication to community about what this group is doing, in order to sell this plan.
11. There are a lot of misunderstandings about broadband that need to be resolved through communication.

Outcomes

This section reflects areas of agreement on goals and objectives going forward. Given the structure of the planning workshop many of the objectives are general or preliminary in nature. The planning process will be responsible for taking these Outcome Statements and turning them into a Broadband Plan for the region. The planning process will consist of teleconference calls of the North Region Working Group and production of a draft Broadband Plan by the Baker / SNG team. The resulting draft Broadband Plan for the North Region will be presented to a stakeholder workshop in March for final discussion, input and adoption. The draft plan will begin to address the implementation by identifying specific tasks, timelines, cost/benefit statement, outcome measures, and responsibilities. If any area is not completely addressed in the draft plan, they will be addressed at the stakeholder workshop.

Develop a Strategic Plan for Broadband Availability

- I. A strategic plan will be developed for production of detailed and targeted information needed to initiate efforts that address broadband access and availability, while also engaging Providers in identifying and developing solutions. The plan will provide tools to assist local governments and stakeholders in developing a “kit” of information with resources specific to broadband, with defined technical service levels and requirements to make it easier for Providers to understand the business needs.
- II. The strategic plan will include sections on both residential and commercial broadband availability.
- III. The Strategic plan will develop a vision statement for commercial broadband in the corridor.
- IV. The Strategic plan will identify complementary efforts to these regional efforts :
 - Demand Aggregation
 - Business Surveys
 - CAI identification & inventory,
 - Wi-Fi Hot-Spot strategies
- V. Connected to the above, the plan will provide strategies for developing the leadership needed to build capacity for sustaining ongoing efforts over time.
- VI. More thorough information is needed to gain an understanding of different business and ownership models and the elements involved. The strategic plan will provide examples of successful Broadband business models for use in un-served or underserved areas, as well as sample legal documents such as RFIs, RFPs and water tower leases;
- VII. Funding is a critical component to the North Region Plan, regardless of the model involved. The Plan will identify possible funding sources to enable a sustainable effort over time

Appendix V - Project Area Scope of Work

Name of Region NORTH Name of Project Area KIPDA/NKADD

| | |
|--|--|
| Planning and Outreach Priorities | Broadband planning and outreach priorities for this Project Area: 1. Bandwidth to meet world-class industrial standards |
| Project Area Boundaries | Boundaries for this Project Area: <u>KIPDA-NKADD</u> <u>OLDHAM-TRIMBLE-Carroll-Henry-Gallatin-Owen</u> |
| Priorities (Sector/Geography) | Priority sectors and/or geographies for focus in this Project Area: 1. Industrial sector – adequate service |
| Availability, Adoption, Utilization Gaps | Broadband availability, adoption, or utilization gaps for focus in this Project Area: 1. Increasing/Develop BB infrastructure along I-71 corridor |
| Project Area Working Group Membership | Individuals who have agreed to be members of this Project Area Working Group: 1. Lisa Cooper, NKADD 2. Jack Couch, KIPDA 3. Drew Tilow, NKADD 4. Keith Roberts, KIPDA 5. Felicia Harper, KIPDA |
| Project Area Working Group Chair | Individual who has agreed to chair this Project Area Working Group: • Lisa Cooper – Jack Couch (co-Chairs) |
| Next Steps | Next steps and timeframes guiding the work in this Project Area: 1. Meet w/I-71 Work Group 2. Finding needs of I-71 Work Group 3. Meet w/Family Resource Centers - Schools 4. Local Chambers of Commerce |

** If additional space is required, please attach additional pages to this template. **

Approved: May 31, 2012 - KY Broadband North Planning Session Jack & Lisa

1) Project Area Focus:

- Oldham, Trimble, Carroll, Henry, Gallatin, Owen
- Availability of advanced broadband in I-71 corridor

2) Project Area Profile: (Baker/SNG Team responsibility)

The project area profile will draw on data in recent reports, with specific attention paid to outlining the current availability of advanced broadband. The profile will provide criteria for exploring advanced broadband.

- Detailed description of existing broadband infrastructure in I-71 corridor.
- Criteria for broadband infrastructure goals and options.

3) Identify, contact and recruit stakeholders for Initial Planning Session (Sept)

Stakeholders Recruitment (Working Group responsibility)

- Make personal contact with key stakeholders to ensure availability and participation
- Send written workshop invitations (and personal calls if time and energy permit)
- Send Invitations to pre-workshop Webinar

Types of Stakeholders to be Recruited

- A. Availability of advanced broadband
 - Local governments in target areas.
 - Organizations involved in I-71 planning
 - ISPs and WISPs

4) Logistics

- a) Identify and confirm Initial Planning Area (IPA) Workshop date and location
- b) Identify how invitations will be sent out, including follow-up and registration process.
- c) Other logistics: refreshments, audio-visual aids, etc.

5) Purpose of Initial Planning Area (IPA) Workshop in September

- a) General awareness and education around broadband adoption and utilization
- b) Presentation of Project Area Profile
- c) Discussion and issue identification within focus area: advanced broadband in I-71 Corridor
- d) Priority setting
- e) Identification of general strategies for dealing with priority issues

Appendix VI - Project Area Profile: North Kentucky

This section provides a profile of Internet utilization in the North Region, consisting of the KIPDA and Northern Kentucky Area Development Districts, but excluding Jefferson County (unless otherwise noted). Most of the material is taken from the Kentucky e-Strategy Report and consolidated into one area-specific profile. For context in prioritizing regional planning activities it is important to consider the overall profile of the population and economy of North Kentucky.

Figure 1: Demographic and Economic Profile of North Kentucky (excluding Jefferson)

| Households | North minus Jefferson | Kentucky |
|------------------------------------|-----------------------|----------------|
| Population | 656,642 | 4,339,367 |
| Median Household Income | \$54,330 | \$40,061 |
| % in Poverty | 11.4% | 18.4% |
| % of Population 65+ | 11.1% | 13.3% |
| Organizations | | |
| Establishments | 12,417 | 90,511 |
| Employment | 215,405 | 1,480,658 |
| Annual Payroll (in billions) | \$7.59 | \$51.44 |
| Average Size of Employer | 17.3 employees | 16.4 employees |
| USCB County Business Patterns 2009 | | |

North Kentucky has significantly higher than average (median) income and an age profile similar to the State. The area has proportionally 38 percent less households in poverty compared to Kentucky as a whole. At 13.9 percent of employment and 14.7 percent of payroll, Health Care and Social Assistance plays a large role in the North region (followed by Manufacturing). Northern Kentucky has the most diversified economy of the five regions, with the eight largest industries, ranked by employment, representing 68.1 percent of all employment in the region.

Figure 2: Largest Economic Sectors in North Kentucky (including Jefferson)

| Rank | Industry Sector | | Percent Employment |
|--------------|-----------------------------------|---------------------|--------------------|
| 1 | Health Care & Social Assistance | | 13.9% |
| 2 | Manufacturing / Processing | | 10.9% |
| 3 | Retail Trade | | 10.4% |
| 4 | Accommodation & food services | | 10.2% |
| 5 | Finance & Insurance | | 6.3% |
| 6 | Administrative & Support Services | | 5.9% |
| 7 | Wholesale Trade | | 5.5% |
| 8 | Professional & Technical Services | | 5.1% |
| | % Employment | | 68.1 % |
| % of Payroll | 64.9% | % of Establishments | 67.2% |

Figure 3: Age Profile of North Kentucky (including Jefferson)

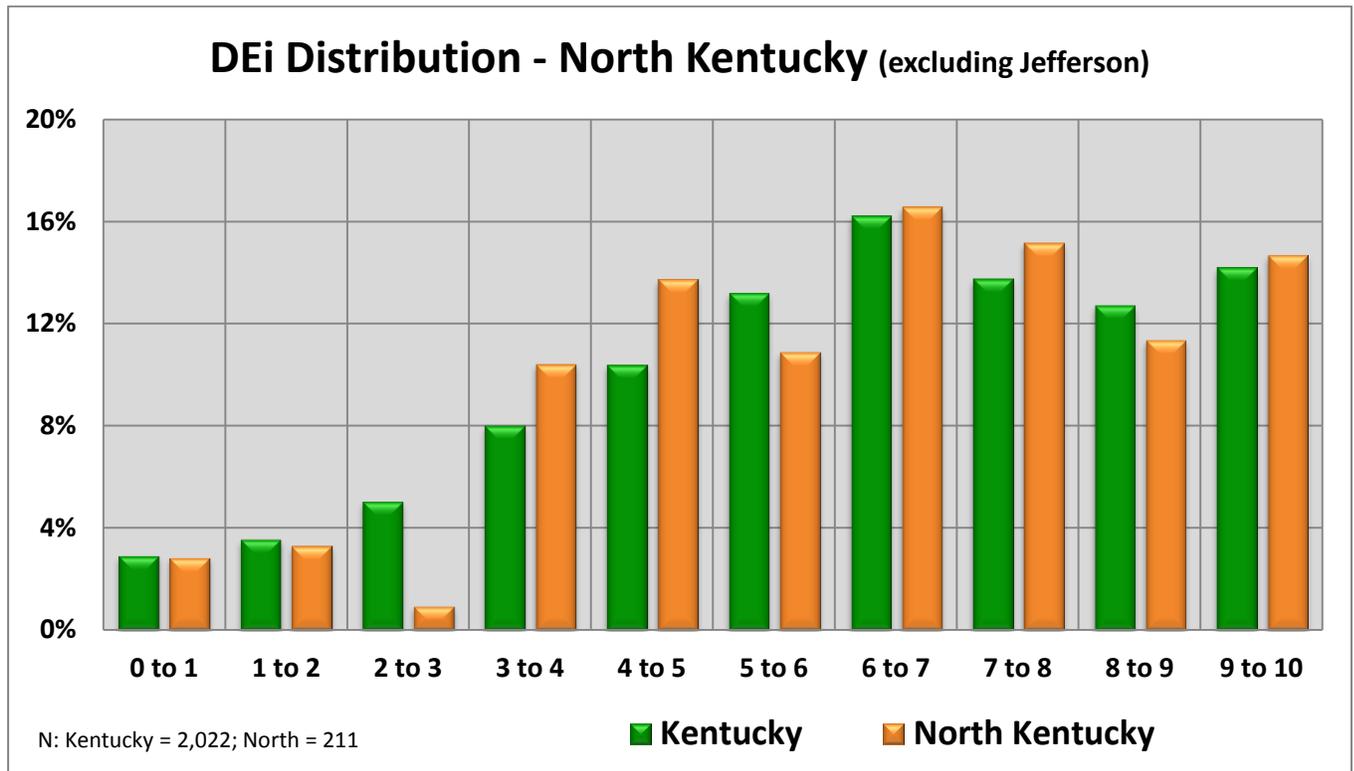
| Age Distribution of Adults | North | Statewide |
|----------------------------|-------|-----------|
| 18 to 34 years | 22.4% | 22.6% |
| 35 to 49 years | 21.3% | 20.7% |
| 50 to 64 years | 19.7% | 19.8% |
| 65 years and over | 12.3% | 13.3% |

Utilization by Organizations in North Kentucky

Internet utilization by organizations in North Kentucky is moderately higher than the state average. The median Digital Economy Index (DEi) for North Kentucky (excluding Jefferson) is 6.6 compared to the statewide DEi of 6.41. The profile of utilization levels from low (1) to high (10), mimics statewide patterns.

| Median DEi Score | | |
|------------------|--------------------------------------|-------------------|
| Kentucky | North Kentucky (excluding Jefferson) | Ranking by Region |
| 6.41 | 6.60 | N/A |

Figure 4: Range of Internet Utilization by DEi



There are significant differences in how various industries utilize the Internet. One of the most important of these is the size of an organization, which impacts an organization’s ability to adopt and benefit from more difficult e-solutions. Smaller organizations have lower levels of Internet utilization as seen below:

Figure 5: Internet Utilization by Employment Size: North Kentucky (excluding Jefferson)

| Organizations by Number of Employees | Kentucky DEi (Median) | North Kentucky DEi (Median) | Sample Size |
|--------------------------------------|-----------------------|-----------------------------|----------------|
| | | | North Kentucky |
| 1 to 4 | 5.83 | 6.31 | 71 |
| 5 to 49 | 6.41 | 6.56 | 98 |
| 50 to 99 | 6.8 | 6.85 | 21 |
| 100 or more | 7.38 | 7.57 | 25 |
| All Size Ranges | 6.41 | 6.6 | 215 |

Smaller organizations have significantly lower DEi, creating a marked opportunity to increase utilization levels. This is particularly relevant since organizations with 1 to 49 employees represent 93.2 percent of organizations in North Kentucky.

Figure 6: Share of Labor Force by Size of Organizations (including Bluegrass)

| Number of Employees | North Kentucky |
|---------------------|----------------|
| 1 to 19 | 82.8% |
| 20 to 49 | 10.4% |
| 50 to 99 | 3.7% |
| 100 to 499 | 2.8% |
| 500 or more | 0.3% |

It is usually very informative to look at which industry sectors vary in their Internet utilization levels from state-wide averages and how they compare to the other regions. However, for the most part, the North Region does not exhibit any notable gaps (the only region without gaps). The following industries show relative **strength or weakness within North Kentucky** in terms of Internet utilization levels based on DEi and how that sector compares to other regions in Kentucky. The ranking of industries across regions is particularly informative, since this tracks competitiveness and relative performance.

Figure 7: Strong and Weak Utilization by Industry Sectors

| Region | Strong (High DEi or Ranking) | Weak (Low DEi or Ranking) |
|----------------|---|---|
| North Kentucky | <ul style="list-style-type: none"> Professional & Technical Services Information Services Public administration Health Care & Social Assistance | <ul style="list-style-type: none"> Manufacturing Other services |

The following table summarizes utilization for major industries within North Kentucky (according to DEi scores) and compared to the state average, as well as the region’s ranking among the five regions.

Figure 8: Summary of Utilization Levels by Industry Sector (North Region including Jefferson)

| Major Industry Category | Statewide | North Kentucky (including Jefferson) | Rank Compared to Other Regions |
|------------------------------------|-----------|--------------------------------------|--------------------------------|
| Finance & Insurance | 7.5 | 7.43 | 4 |
| Information | 6.9 | 7.69 | 1 |
| Educational Services | 6.7 | 6.71 | 3 |
| Manufacturing / Processing | 6.6 | 6.38 | 2 |
| Retail Trade | 6.4 | 6.53 | 2 |
| Other services (exc. public admin) | 6.3 | 5.85 | 5 |
| Professional & Technical | 6.2 | 6.93 | 1 |
| Wholesale Trade | 6.2 | 6.51 | 2 |
| Construction | 5.8 | 6.44 | 1 |
| Health Care & Social Assistance | 5.7 | 5.93 | 1 |
| Public Administration | 5.2 | 5.71 | 1 |

Opportunities and Gaps Based on Utilization

The following is a list of industries that show the largest gaps in utilization for North Kentucky, grouped into 2 gap level categories. Everything else being equal, the largest gaps present the greatest opportunity to increase utilization. Prioritization should also consider industry size and growth potential. In North Kentucky there are no large gaps in utilization – the only region in Kentucky without significant gaps. Nonetheless, it can be noted that the manufacturing sector showed below average performance and is the region’s second largest sector.

Figure 9: Gaps and Opportunities for Increasing Utilization by Industry Sector

| Major Industry Category | North Region Variation from State Average | Sector Size - Rank within Region | Growth Expectation |
|---|---|----------------------------------|--------------------|
| Health Care & Social Assistance | 0.2 | 1 | ↑ |
| Manufacturing / Processing | -0.19 | 2 | ↑ |
| Retail Trade | 0.17 | 3 | ↑ |
| Finance & Insurance | -0.04 | 5 | |
| Wholesale Trade | 0.29 | 7 | ↑ |
| Professional & Technical Services | 0.69 | 8 | ↑ ↑ |
| Construction | 0.6 | 10 | ↑ ↑ |
| Information | 0.79 | 12 | ↓ |
| Public Administration | 0.54 | n/a | |
| Gap 1 (0.6 or more below the state DEi) | 0 | | |
| Gap 2 (0.6 to 0.3 below statewide DEi) | 0 | | |

**To assess growth potential, this profile uses projections made by Moody Analytics. The arrows in the right column indicate projected growth or decline. The double green arrows indicate significantly higher growth expectations.*

Barriers to Utilization

Barriers to utilization are those factors that tend to inhibit or prevent effective adoption of Internet-enabled applications. Barriers for organizations in North Kentucky are similar to the rest of Kentucky, with privacy, slow Internet and lack of internal expertise the most frequently cited.

Figure 10: Barriers to Adopting Internet Applications and Processes (excluding Jefferson)

| Barriers to e-Solutions - % Saying Important | North | Statewide |
|--|-------|-----------|
| Privacy concerns | 75.4% | 71.4% |
| Available Internet is too slow | 63.4% | 59.2% |
| High cost of development/maintenance | 49.7% | 45.8% |
| Lack of internal expertise and knowledge | 49.7% | 41.5% |
| Suppliers not ready | 46.1% | 45.8% |
| Loss of personal contact with clients | 43.5% | 45.1% |
| Security concerns | 31.4% | 28.7% |
| Uncertain about benefits | 29.8% | 24.6% |
| Internal organization resistance | 26.7% | 28.7% |
| Products not suited to Internet sales | 23.0% | 24.9% |

Impacts from Increasing Utilization

Increased utilization by organizations results in increased revenue and job creation. Increasing an organization's DEi by 1.0 is roughly equivalent to adopting two new utilizations, preferably in more sophisticated types of utilizations that tend to be adopted by high utilization organizations. The increased revenues can take one or two years to materialize, but would directly increase regional GDP and have additional indirect and induced effects on the regional economy.

New jobs would also be created from growing businesses. While total job growth is difficult to predict and is not exclusively driven by Internet utilization, e-solutions benchmarking data for Kentucky show that 34.3 percent of new full-time jobs were attributed to commercial businesses' use of the Internet. Results reported by commercial enterprises in North Kentucky were more impressive at 67.5 percent, though this came from a relatively small sample of thirty nine.

Figure 11: Job Creation and Internet Use in Commercial Enterprises

| Region | Total Employees | New Jobs Created* | New Jobs Attributed to Internet | % of New Jobs Attributed to Internet* | Number of Reporting Establishments |
|----------------|-----------------|-------------------|---------------------------------|---------------------------------------|------------------------------------|
| North Kentucky | 1,582 | 342 | 231 | 67.5% | 39 |
| Kentucky | 15,657 | 1,731 | 593 | 34.3% | 401 |

Households in North Kentucky

Utilization of the Internet by households in the North Kentucky is significantly higher than the state average. The overall Digital Economy Index (DEi) for households in North Kentucky is 6.54 compared to the statewide DEi of 6.1.

Figure 12: Utilization by Households: DEi Score for North Region, excluding Jefferson

| | Average DEi Score | Rank | Difference from Average | Households in Sample |
|----------------|-------------------|------|-------------------------|----------------------|
| North Kentucky | 6.54 | N/A | + .44 | 413 |
| Statewide | 6.1 | | | 4,122 |

Demographic Effects on Utilization

There are a number of factors that contribute to higher household utilization in North Kentucky. With a slightly younger and significantly more affluent population, it is no surprise that North Kentucky has households with above average computer skills and above average utilization. In general, Internet utilization is lower for older age groups and for lower income groups. Utilization levels are also directly proportional to computer skill levels which in turn are associated with older age and lower income groups.

Figure 13: Impact of Age and Income on Internet Utilization (excluding Jefferson)

| North Kentucky | Household Income | | | |
|-------------------|--------------------|----------------------|-----------------------|---------------------|
| Respondent Age | Less than \$30,000 | \$30,000 to \$49,999 | \$50,000 to \$100,000 | More than \$100,000 |
| 18 to 34 | 6.08 | 6.59 | 6.15 | 7.07 |
| 35 to 54 | 5.05 | 6.75 | 6.86 | 7.88 |
| 55 to 64 | 6.35 | 5.28 | 6.09 | 6.60 |
| 65 years and over | 3.80 | 5.35 | 6.11 | 6.58 |

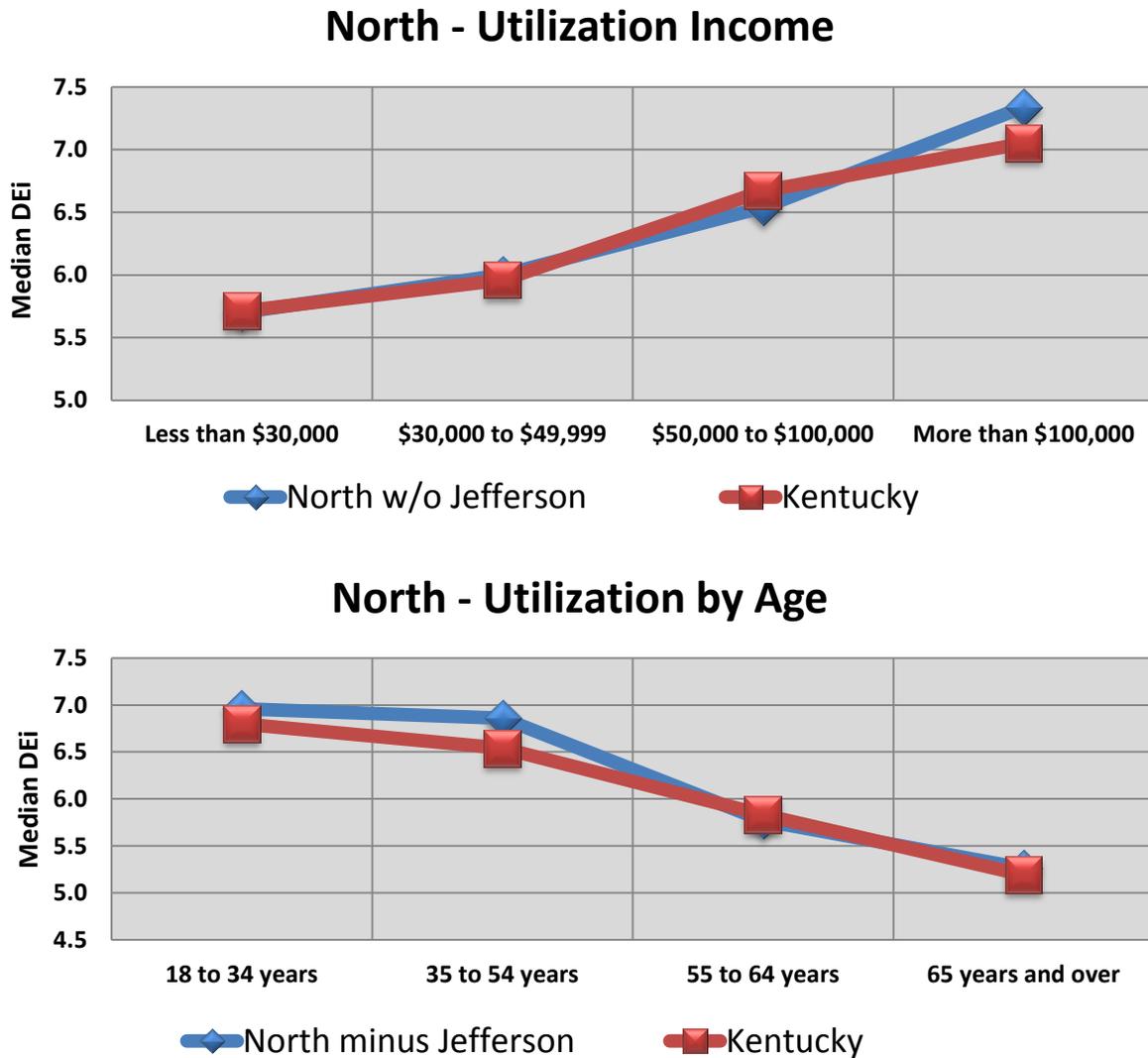
Figure 14: Computer Skill Levels (excluding Jefferson)

| | Expert user | Use computers with confidence | Know the basics |
|----------------|-------------|-------------------------------|-----------------|
| North Kentucky | 26.5% | 59.6% | 13.4% |
| Statewide | 25.6% | 59.9% | 14.1% |

For North Kentucky, 13.4 percent of households “know only the basics” in computer skill. North Kentucky households face the same statewide issues of relatively low utilization by those over 55, with lower incomes and poor computer skill level. As a factor that can be addressed through broadband support initiatives, targeting computer skill development at these groups is a clear priority and likely to have the

greatest impact on increasing utilization and consequently on the ability of households to earn income and access government services.

Figure 15: North Internet Utilization Levels by Age and Income



Use of Internet for Productivity

In terms of productivity, households in the North region show above average utilization for most work oriented activities, including telework, home-based businesses, and accessing their work place from home.

Figure 16: Percentage of Households Using the Internet for Productivity (excluding Jefferson)

| North Kentucky | % Currently Engaged In | Statewide Average | Variance from State Average |
|-----------------------|------------------------|-------------------|-----------------------------|
| Accessing workplace | 56.1% | 55.6% | +0.5% |
| Home business | 26.1% | 20.8% | +5.3% |
| Telework | 26.1% | 20.8% | +5.3% |
| Education or training | 40.5% | 45.9% | -5.4% |

Focus on Project Area Priorities

The North Region has identified improving broadband infrastructure along the 1-71 Corridor to world-class standards as its priority focus. This profile provides some insights into current connectivity within the region. Readers should keep in mind that the sample sizes are relatively small and should be used with caution. Nonetheless, the data on this priority area is suggestive and worth consideration.

According to the 63 responding organizations from the five counties of Carroll, Gallatin, Henry, Oldam and Trimble, their level of satisfaction with speed and reliability of connections is comparable to the state average. Only a relatively small percentage of respondents stated that their connection had frequent reliability problems (11.1%) or was not fast enough (14.3%). In contrast, over 60% stated that available Internet was too slow and constituted a barrier to adopting new applications and processes. This discrepancy can partly be explained by the fact that many respondents who rate their own connection as “very fast” or “fast enough” with always excellent reliability still say that there is a need for faster and more reliable Internet service. In addition, respondents from the five counties were disproportionately from smaller businesses with less than 20 employees.

Appendix VII: Glossary

Broadband KY e-Strategy Report: This report examines how organizations and households in Kentucky differ in their utilization of broadband and where they can look to make improvements. The report shows in detail how different industry sectors and household types compare to each other, especially between and within regions. The report provides insights and hard evidence that allows regions, businesses, and households to assess where they stand. The report provides recommendations on strategies for improving their Internet performance and benefits.

Broadband KY e-Solutions Benchmarking Technical Report: 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. This largely descriptive report results provide insight into gaps and opportunities for increasing broadband utilization by organizations and households. The policy, planning and program implications for Kentucky and its regions are dealt with in a separate report: the *Broadband KY e-Strategy Report*.

Digital Economy Analysis Platform (KY- DEAP): The DEAP has been developed as an online resource that provides clients with access to the data collection results and the ability to customize their analysis across a range of variables, including industry sector or geographic region. The DEAP is accessed online by authorized users. Users are presented with **dashboards** for businesses and for households. Each dashboard is organized around a series of **pages** focused on specific topics, e.g. Connectivity, Utilization, DEi, Impacts, etc. Within each page is a set of predefined **reports** that present a chart and/or table of processed results from the datasets.

e-Strategies: e-Strategies are high level plans for achieving one or more goals related to improved access to and utilization of broadband Internet. e-Strategies define a course of action that is most likely to successfully address opportunities, challenges or barriers related. Strategies are usually seen as distinct from detailed action plans which deal with specific issues of “who, what, when and how”.

e-Solutions: refers to the integration of Internet technologies with the internal computer-based systems and applications within or among organizations for a variety of operational processes. e-Solutions encompass not only product delivery and payment transactions (e-commerce) but also all processes that may be facilitated by computer-mediated communications over the Internet.

e-Process: uses of the Internet which include internal operational uses, such as supplier coordination, training and teleworking.

e-Commerce: uses of the Internet which include activities related to the sales, marketing and delivery of products and services; and,

Kentucky Digital Economy Index (KY-DEi): The Digital Economy index (DEi) is part of the benchmarking process and provides reference points against which the performance of any individual or group can be compared. The DEi summarizes an organization’s or household’s utilization of a range of Internet applications and process – 17 for organizations and 30 for households. Based on the number of

applications currently being used by an organization or household, a composite score is calculated that summarizes how comprehensively each organization or household uses Internet-enabled e-solutions. The DEi can be used to compare organizations, regions, or industry sectors.

Utilization refers to the third stage in the broadband development process. The first stage is providing a community, household or organization with access (availability) to the Internet. The second stage is adoption or the process whereby a person or organization starts to actually use the Internet. The third stage is utilization whereby a person or organization uses their Internet connection to create value. Many people and organizations have access and have adopted the Internet, but are relatively ineffective in how they use and derive benefits from the Internet. The field of analysis labeled “utilization” explores patterns of Internet use and how these patterns can be enhanced.

*Commonwealth of Kentucky Office of Broadband
Outreach and Development*



Baker



strategic
networks group
the broadband economists