

Broadband *KY*

East Kentucky Profile

Utilizations and Impacts of Broadband
for Businesses, Organizations and Households



This report was prepared by Strategic Networks Group in
partnership with Michael Baker Jr., Inc.

Baker



September 21st, 2012

Prepared for:

*Commonwealth of Kentucky Office of Broadband
Outreach and Development*



COMMONWEALTH OFFICE
OF BROADBAND OUTREACH
AND DEVELOPMENT
Promoting a 21st century economy



TABLE OF CONTENTS

1. Background	5
2. State-wide Recommendations	7
3. Starting Points	12
3.1 Organization and Objectives of the Report	12
3.2 Introducing the Digital Economy index (DEi)	13
4. Project Area Profile: East Kentucky	16
4.1 Utilization by Organizations in East Kentucky	17
4.1.1 Opportunities and Gaps Based on Utilization	19
4.1.2 Barriers to Utilization	20
4.1.3 Impacts from Increasing Utilization	20
4.2 Households in East Kentucky	21
4.2.1 Demographic Effects on Utilization	21
4.2.2 Use of Internet for Productivity	22
4.3 Focus on Project Area Priorities	23
Appendix 1: Breakdown of Regions by County	27
Appendix 2: Glossary	28
Figure 1: Kentucky Regions	11
Figure 2: Demographic and Economic Profile	16
Figure 3: Largest Economic Sectors in East Kentucky	16
Figure 4: Age Profile of East Kentucky	17
Figure 5: Range of Internet Utilization by DEi	17
Figure 6: Internet Utilization by Employment Size: East Kentucky	18
Figure 7: Share of Labor Force by Size of Organizations	18
Figure 8: Strong and Weak Utilization by Industry Sectors	18
Figure 9: Summary of Utilization Levels by Industry Sector	19
Figure 10: Gaps and Opportunities for Increasing Utilization by Industry Sector	19
Figure 11: Barriers to Adopting Internet Applications and Processes	20
Figure 12: Job Creation and Internet Use in Commercial Enterprises	20
Figure 13: Utilization by Households: DEi Score and Regional Ranking	21
Figure 14: Impact of Age and Income on Internet Utilization	21
Figure 15: Computer Skill Levels	21
Figure 16: Internet utilization Levels by Age and Income	22
Figure 17: Percentage of Households Using the Internet for Productivity	22
Figure 18: County and Municipal Government - Utilization Characteristics	23

Figure 19: County and Municipal Government - Utilization by Region..... 23
Figure 20: Nine Local Government Uses of the Internet – Regional Comparison..... 24
Figure 21: County and Municipal Government - Utilization Characteristics 25

This report is one of several deliverables that are part of the Kentucky Broadband Project of the Commonwealth Office of Broadband Outreach and Development (OBOD), and managed by Michael Baker Jr., Inc. (Baker). Ongoing project reporting, outreach, field work, surveys, data analysis and development and map production incorporate information relating to the Commonwealth's Broadband availability, utilization and adoption in specific regions, including characteristics such as service provider data and coverage areas, industry and business data, and household demographics. The project derives from the American Recovery and Reinvestment Act (ARRA) of 2009; funded from the State Broadband Initiative (SBI), and administered by the National Telecommunications and Information Association (NTIA) for a five-year period from 01/01/2010 to 12/31/2014.

For certain project components, Baker contracted with Strategic Networks Group (SNG) to administer user surveys, and to tabulate, analyze and develop reports based on the collected survey data. The Project Area Profile on the following pages was prepared by Strategic Networks Group under contract to and in partnership with Michael Baker Jr. Inc.

This report is the second of two companion documents:

- 1) The Kentucky e-Strategy Report provides a state-wide analysis of utilization of the Internet. This state-wide perspective highlights trends that impact all regions to some degree. The report includes a comparative analysis of the Internet across the five regions of Kentucky: East, Central, West, North and Northeast. (See appendix for list of counties within each of the five regions).
- 2) The second set of documents consists of profiles for areas undertaking broadband planning initiatives in collaboration with the Kentucky Office of Broadband Outreach and Development (OBOD) and the Kentucky Council of Area Development Districts (KCADD). Recommendations from the Kentucky e-Strategy Report are reproduced in section 2 of each area profile, thereby providing a state-wide framework for local and regional broadband planning.

In addition to the documents noted above, the Office of Broadband Outreach and Development and the Kentucky Association of Area Development Districts can access an online platforms that include databases on Internet use and impacts, as well as the underlying broadband infrastructure. These online platforms can provide customized reports on specific issues for defined geographic areas or sectors.

The area profiles focus on the specific opportunities and gaps for five geographic areas: Central Kentucky (Lincoln Trail, Lake Cumberland and Barren River Area Development Districts), **East Kentucky (Big Sandy, Cumberland Valley and Kentucky River Area Development Districts)**, Northeast Kentucky (Buffalo Trace, Gateway and FIVCO Area Development Districts), Purchase Area Development District, and North (KIPDA and Northern Kentucky, excluding Jefferson County).

In each of the geographic areas that are profiled, a broadband planning initiative is being undertaken on an issue specific to that region. In the East Region, that issue is improving local

government use of the Internet as part of a strategy to engage local residents and provide compelling reasons for them to “get online”. Section 4.3 of this profile provides data and analysis specifically on local government use of the Internet within the East region. The other parts of this report include:

- **Sections 1 & 2: Background and Recommendations.** These two sections provide a state-wide perspective of issues related to broadband adoption and utilization. Section 2 includes Kentucky wide recommendations that provide a framework for local and regional broadband planning and efforts.
- **Section 3: Starting Points.** This section introduces basic concepts required for comparative analysis of broadband use in regions and sectors across Kentucky.
- **Section 4: Project Area Profile.** This section includes data and analysis specific to the project area – in this case the East Region.

Those interested in a more detailed exploration of regional performance in broadband utilization are strongly encouraged to contact staff from OBOD and KCADD.

1. Background, Summary and Recommendations

Many communities and regions across Kentucky face significant challenges, among them economic dislocation and an aging population. Most rural areas face the additional challenge of population shifts from rural to urban areas. In the face of these challenges, how can communities and businesses maximize their competitiveness, while improving their quality of life?

One area with significant potential is broadband (essentially high-speed Internet access), which can be leveraged into tangible benefits for communities, businesses and households. Businesses can become more productive, competitive and reach into new markets. Households can access services more easily and often more cheaply. Governments can delivery services more cost effectively.

The first step in benefiting from broadband is acquiring connectivity or access to the Internet. Once access is acquired, the second step is adoption, whereby households, businesses and other organizations begin to use their high-speed Internet access on a regular basis.

The third stage in broadband development is utilization of the Internet in increasingly productive ways that bring concrete benefits, such as jobs, new savings and revenues, and improved quality of life. This report focuses on utilization as the third stage of broadband development.

The benchmarking of Internet utilization in Kentucky is based on data collected in February and March 2012. This report represents an analysis of this data from a regional perspective and is intended to support regional broadband planning.

Utilizing Broadband

The ability to utilize or leverage broadband varies significantly across businesses, organizations and households. Not all businesses or households have been able to turn the potential of broadband into measurable success in terms of jobs, company attraction and retention, increased tax base and revenues, and more efficient and effective citizen services. Turning potential into reality requires skills, training, and both formal and informal support, all in addition to access to broadband availability.

In those industry sectors and communities that already have a large, diverse and modern economy and work force, building broadband infrastructure may be sufficient to realize the potential of broadband. However, many industry sectors, communities, businesses and households have limited Internet related skills and capacity. For these groups, even with state-of-the-art connectivity, leveraging broadband often lags. The consequence is that these communities (and households and businesses) lose out on many of the benefit of broadband. More importantly, over time, these communities are at risk of becoming economically uncompetitive and generally less attractive to households and businesses.

This report examines how organizations and households in East Kentucky differ in their utilization of broadband and where they can look to make improvements. The report shows in detail how industry sectors and household types in East Kentucky compare to each other and to statewide patterns. The report provides insights and hard evidence that allow communities, businesses, and households to assess where they stand and to identify what kinds of actions will improve their performance and benefits.

The report includes statewide recommendations for how the Commonwealth of Kentucky and its regions can improve the utilization of broadband, thereby improving their economies and quality of life. Recommendations are broken down into three areas: gaps and opportunities where regions are lagging in their use of the Internet and broadband; key barriers to improving the use and benefits of Internet and broadband; and the best ways to build skills and abilities. Analysis and recommendations are identified for both organizations (commercial and non-commercial) and households. For the purposes of this report, regional analysis has been organized into five distinct regions of Kentucky: North, Northeast, East, West, and Central. The composition of these five regions is outlined in Appendix 1.

*This report uses data collected in February through April 2012 across Kentucky. A total of 2,231 organizations and 4,122 households contributed to the state-wide broadband benchmarking effort. The sample for East Kentucky is 279 organizations and 455 households.**

* A summary of the findings from the 2012 benchmarking effort can be found in the *Broadband KY e-Solutions Benchmarking Technical Report* (May 2012). The number of responses collected in this analysis is substantial, especially when compared to national polls.

2. State-wide Recommendations

To assist stakeholders and communities to better understand and use this report, the recommendations of the Kentucky e-Strategy Report were structured around fundamental questions that leaders and decision-makers face in terms of leveraging broadband for the socio-economic benefit of their communities and constituents.

1. How important is high-speed Internet access to Kentucky, its communities and its residents?

In the twenty-first century, high-speed Internet access has been 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 high-speed Internet access speaks directly to a community's viability, competitiveness and quality of life. However, each region and community has its own unique characteristics, assets and challenges. Current Internet usage and opportunities for development vary widely, as explored in detail in the various sections of this report. Each region requires strategies and initiatives that address its unique situation. The Commonwealth can provide support, but social and economic developments are essentially local and regional in nature.

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.

Benchmarking Data for Kentucky, May 2012.

Recommendation #1: *Each region or groups of communities must develop its own strategy and initiatives based on its own characteristics, values and priorities.*

2. Where are the major gaps or weaknesses in utilization of the Internet?

Prioritizing industry sectors and other economic groups must be done within a regional context. Additional factors and considerations exist within each region, such as key industry sectors in decline or regional strategies for developing specific sectors. In general, focus should be on industry sectors that make the largest contribution to the economy and that have the greatest growth potential.

Key gaps in Internet utilization are focused on household income, age, and skill level, degree of "rurality", and organizational size and industry sector.

Recommendation #2: *Focus on high opportunity industry sectors within each region rather than undertaking broad but untargeted initiatives.*

3. How do we use the potential of the Internet to maximize job creation?

Small to medium sized organizations should be a focus for all regions. This segment is important for the following reasons:

- Includes 95% of all establishments and 43% of all employment in Kentucky
- Has the lowest or weakest utilization levels compared to organizations with larger numbers of employees
- Is a dynamic engine for employment growth, especially through use of the Internet
- Has the least capacity and expertise to adopt more sophisticated and productive Internet applications

Recommendation #3: *Focus on the small-medium enterprise segment, especially 1-49 employees, to increase Internet utilization, thereby driving competitiveness, revenues and job creation.*

4. In what areas do small to medium sized business need help?

Broadband KY e-Solutions Benchmarking (eSB) identifies which types of Internet enabled applications and processes are relatively easy or hard to adopt, especially by small to medium sized organizations. Using data on barriers to adoption, action plans can be defined at the regional level to address target groups. Note: e-solutions is the term used in this report 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.

Recommendation #4: *Initiatives aimed at increasing utilization among the small to medium enterprise segment should focus on the following 10 utilization categories:*

1. *Delivery of services and content*
2. *Rich media or service creation¹*
3. *Teleworking*
4. *Staff training and skills development*
5. *Advertising and promotion*
6. *Social networking*
7. *Government transactions*
8. *Customer service and support*
9. *Selling goods or services*
10. *Supplier communication and coordination*

¹ Rich media describes Web pages that use advanced technology such as streaming video, downloaded programs that interact instantly with the user for advertising.

5. How can we reach households that have not adopted the Internet or use it only minimally?

Many households that use the Internet still do not use the Internet very productively. Low utilization households are very similar to non-adopting households. They are disproportionately older and lower income. Households with low Internet adoption represent an important group due to the social and economic benefits that can be accessed through the Internet. As governments and businesses move their services to the Internet to achieve better reach and cost efficiencies, it is increasingly important that citizens have the ability to access and benefit from these online services. However, a large portion of lower income and older households have difficulty adopting and using the Internet. Given that low adoption and utilization is strongly tied to age and income, training should be targeted at people over 64 and households with lower incomes.

The poorer one is and the older one is, the less likely one uses the Internet and the less productively one uses it.

Recommendation #5: *Develop training programs and resources that target households over the age of 64 or have below average incomes.*

6. Is it true that the rural areas have a particularly hard time in adopting and using the Internet?

Yes! While both urban and rural households struggle to use and benefit from the Internet, rural households are relatively disadvantaged, with households being generally older and having lower average incomes. Non-metropolitan areas with significantly lower utilization levels compared to metropolitan areas. Consequently, non-metropolitan households tend to have greater difficulty in accessing educational, health and government services, all of which are increasingly available online.

Recommendation #6: *Non-metropolitan areas are a priority for Internet training programs and resources.*

Rather than trying to entice target populations into existing programs (such as classroom courses), Internet training initiatives should reflect the preference for both self-directed online resources, as well as existing informal networks that already have participation by these target groups. These can include seniors' centers, libraries, churches and community centers.

7. How can we help citizens of Kentucky make better use of the Internet?

Rather than trying to entice target populations into existing programs (such as classroom courses), e-solution adoption initiatives should reflect the preference for both self-directed online resources, as well as existing informal networks that already have participation by these target groups. These can include seniors' centers, libraries, churches and community centers.

Recommendation #7: In designing initiatives to increase and improve Internet utilization by households and organizations, considerable weight should be given to those learning methods that are preferred by the target populations.

The preferred learning methods of 47% of those over 65 in Kentucky are “talking to others” and “online information”. The least preferred learning methods were “workshops” and “classrooms courses” (preferred by 16%).

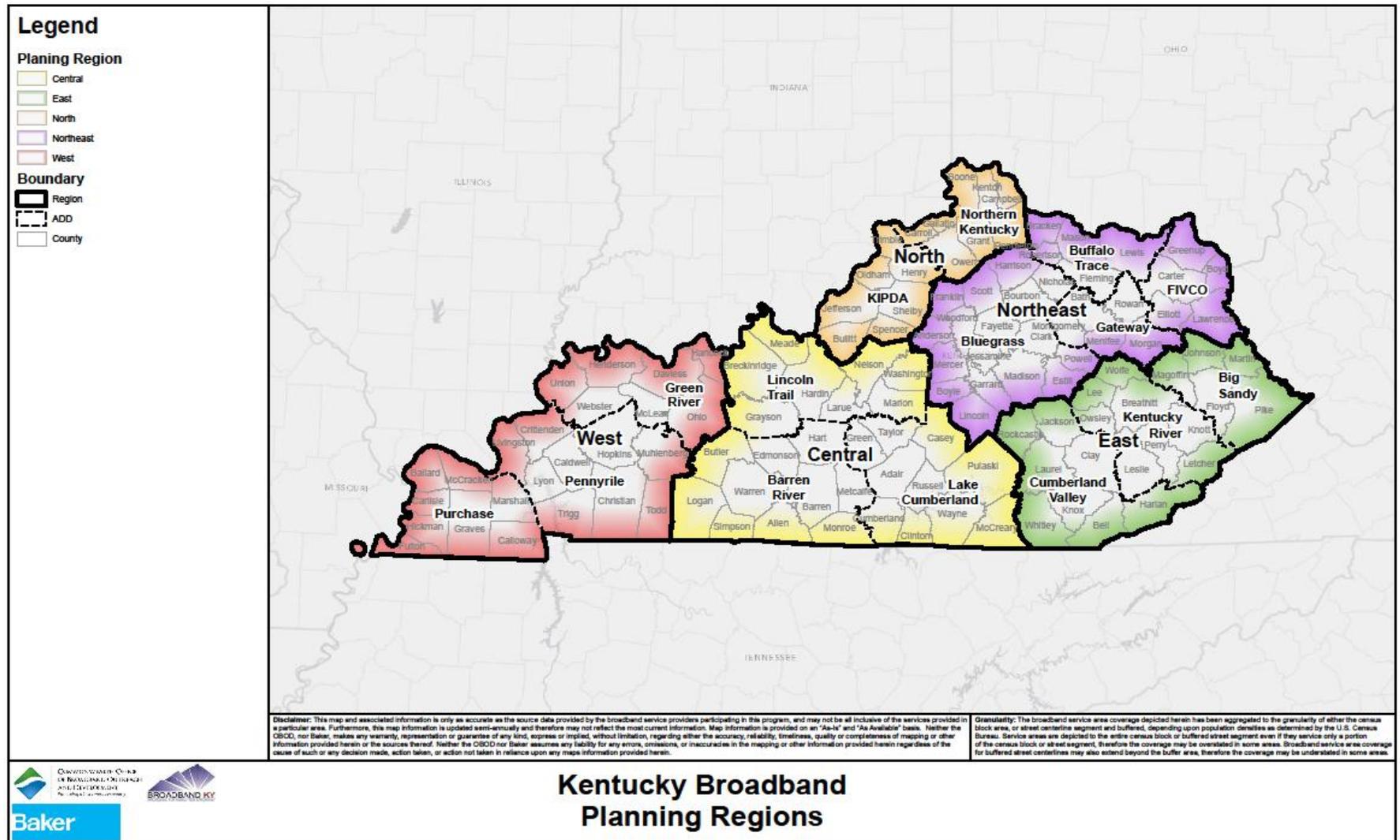
8. How can those who do not use the Internet be assisted to start using the Internet in ways that produce tangible benefits?

Approximately one in five individuals in Kentucky does not use or benefit from the Internet. The largest group of non-Internet users are those 65 years and older. However, lower income households also have significantly lower rates of Internet adoption.

Barriers to Internet adoption vary significantly by type of household. Almost half of non-adopting older households see little value in the Internet, while generally being less skilled in use of computers and Internet. Working age individuals tend to have better computer and Internet skills, but find having Internet at home too expensive. These working age ‘non-adopters’ are more likely to have children at home and have at least one other person in the household who uses the Internet. These working age households are less likely to be completely isolated from the Internet.

Recommendation #8: *Broadband adoption programs should focus on those key groups that face persistent barriers to adoption, specifically elderly households and lower income households where no-one else in the household uses the Internet. Internet adoption programs should be design to address specific barriers facing their targeted group.*

Figure 1: Kentucky Regions



3. Starting Points

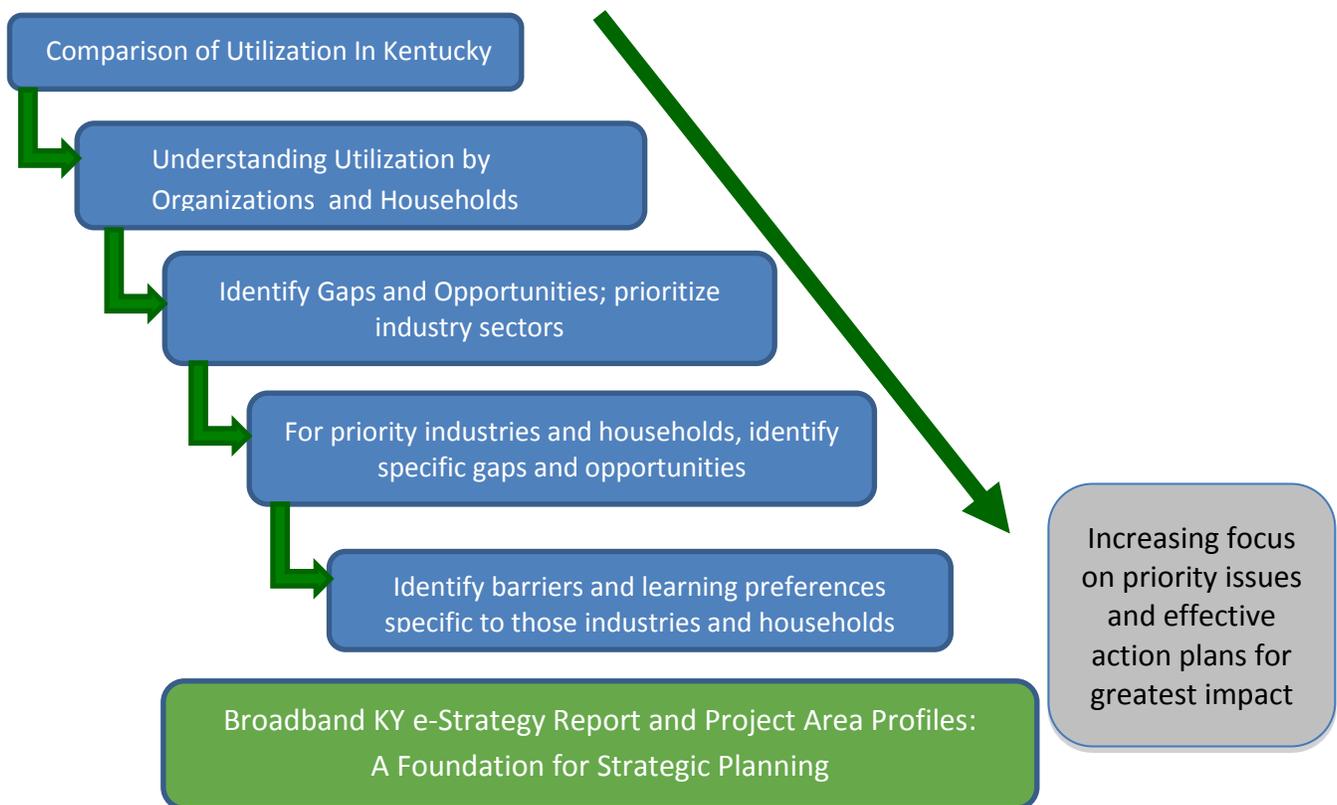
3.1 Organization and Objectives of the Report

This report is designed to be a catalyst for leveraging broadband through actionable intelligence. The chart below outlines steps used in this report to move from descriptive data to detailed analysis of targets, priorities and strategies. The ultimate goal of the analysis of broadband in Kentucky is to:

1. Identify which segments of the regional economy utilize the Internet to a greater or lesser degree;
2. Prioritize the segments that show utilization gaps based on importance to the regional economy and opportunity to address the gaps; and,
3. Identify specific uses of the Internet that should be addressed to close the gaps, resulting in effective actions that are targeted where they will have the most impact.
4. Identify the barriers to improved Internet utilization, as well as the best means to overcome them.

For those interested in a more detailed exploration of regional performance in broadband utilization, you are strongly encouraged to contact regional outreach staff from the Kentucky Office for Broadband Outreach and Development.

Leveraging Broadband for Economic and Social Development



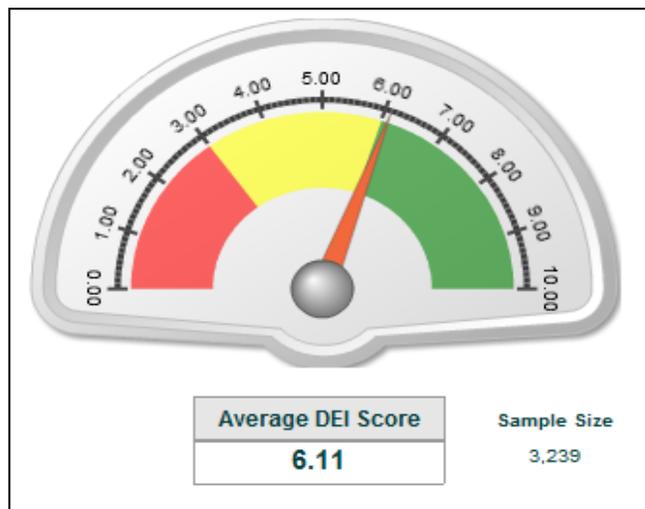
3.2 Introducing the Digital Economy index (DEi)

This report includes comparisons of Internet use between regions by various characteristics, such as industry, business size, and household demographics. To assist in the process of making comparisons, a mechanism was developed for establishing benchmarks. Benchmarks are useful in creating reference points against which the performance of any individual or group can be compared. Strategic Networks Group has developed a benchmarking process based on its Digital Economy index (DEi).

The Digital Economy index (DEi) reflects an organization’s or household’s utilization of a range of Internet applications and process – 17 for organizations and 30 for households. These applications and processes (e-solutions) are listed on the following pages. 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. A separate DEi is used to compare how different types of households use the Internet.

An organization’s or household’s DEi score (from 0 to 10) captures that their utilization of e-solutions, with 10 being the highest possible use. DEi scores are averaged across groups of users by various categories: e.g. a sector’s DEi is the average for all organizations in that sector. The DEi is used as a basis for comparison of utilization levels across various dimensions.

Identifying variations in DEi assists in focusing on areas where a deeper assessment is warranted. In areas where DEi is lower than average, indicating lower utilization, there is an opportunity to increase utilization and benefits to organizations and households.



DEi Meter from dashboard of the Digital Economy Analytics Platform.

The Color Coding for DEi Scores: To better show how industry sectors perform, the DEi tables in this report are color coded from the highest (**green**) to lowest (**red**) to highlight how DEi scores compare. **The color coding (green to red)** allows one to quickly compare groups based on how utilization varies.

Highest
2
3
4
5
6
Lowest
Insufficient Data

Different DEi comparisons can be useful for different purposes, for example:

- Individual organizations can compare their DEi score with a benchmark average DEi score for their industry in their region. This can provide insights into how well an organization is performing in terms of Internet use compared to their peers.

- Broadband planners and economic development agencies can compare DEi benchmarks between different organization characteristics, such as industries and business sizes, to gain insights into relative utilization levels to aid in targeting low utilization groups. They can also compare DEi benchmarks on a regional basis to aid in planning.
- Providers of broadband services and infrastructure can use DEi benchmarks to gain insights into where high utilization levels exist and where low utilization level need to be addressed in order to promote the greatest use from their broadband investments.

e-Solutions refer 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-Solutions Categories for Households	
Communication	Transactions
E-mail	Buying goods or services
Voice over IP	Selling items
Online chat	Investments / trading
Sharing information	Online banking
Personal website	Paying bills
Productivity	Government services
Education or training courses	Music or video download
Accessing workplace	Software download
Teleworking	Booking travel
Home business	Research
Recreation	Product information
News and sports	Investments
Listen to radio	Government information
Watch TV programs	Community events
Watch movies	Education and training
Online gaming	Health information
	Travel information

e-Solutions Categories for Organizations	
<i>e-Commerce Related</i>	<i>e-Process Related</i>
Selling goods or services	Purchasing goods or services
Deliver services and content	Supplier communication and coordination
Rich media or service creation	Electronic document transfer
Customer service and support	Staff training and skills development
Advertising and promotion	Teleworking
Social networking	Accessing collaborative tools
Web site for organization	Banking and financial
Research by staff	Government transactions
	Access government information

4. Project Area Profile: East Kentucky

This section provides a profile of Internet utilization in the East Region, consisting of the Big Sandy, Kentucky River and Cumberland Valley Area Development Districts. 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 East Kentucky.

Figure 2: Demographic and Economic Profile

Households	East	Kentucky
Population	505,473	4,339,367
Median Household Income	\$28,721	\$40,061
% in Poverty	30.4%	18.4%
% of Population 65+	13.8%	13.3%
Organizations		
Establishments	8,764	90,511
Employment	124,173	1,480,658
Annual Payroll (in billions)	\$3.97	\$51.44
Average Size of Employer	14.2 employees	16.4 employees
USCB County Business Patterns 2009		

The East region has significantly below average (median) income and an similar age profile compared to the State. Incidence of poverty in the East Region is 65 per cent higher than Kentucky as a whole. At 19 percent of employment and 22.2 per cent of payroll, the health care and social assistance sector plays a large role in the East region. The mining sector is a key differentiator in the East Region, providing 11 per cent of payroll, though only 4.3 per cent of establishments in the region belong to the mining sector. The eight largest industries, ranked by annual payroll, that collectively represent over 70 percent of the economy in East Kentucky are:

Figure 3: Largest Economic Sectors in East Kentucky

Rank	Industry Sector	Percent Employment
1	Health Care & Social Assistance	19.0%
2	Retail Trade	17.7%
3	Mining	11.1%
4	Accommodation & food services	9.3%
5	Manufacturing / Processing	5.9%
6	Professional & Technical Services	3.6%
7	Transportation & Warehousing	3.4%
8	Construction	3.1%
% Employment		73.1%
% of Payroll	74.6%	% of Establishments 70%

Figure 4: Age Profile of East Kentucky

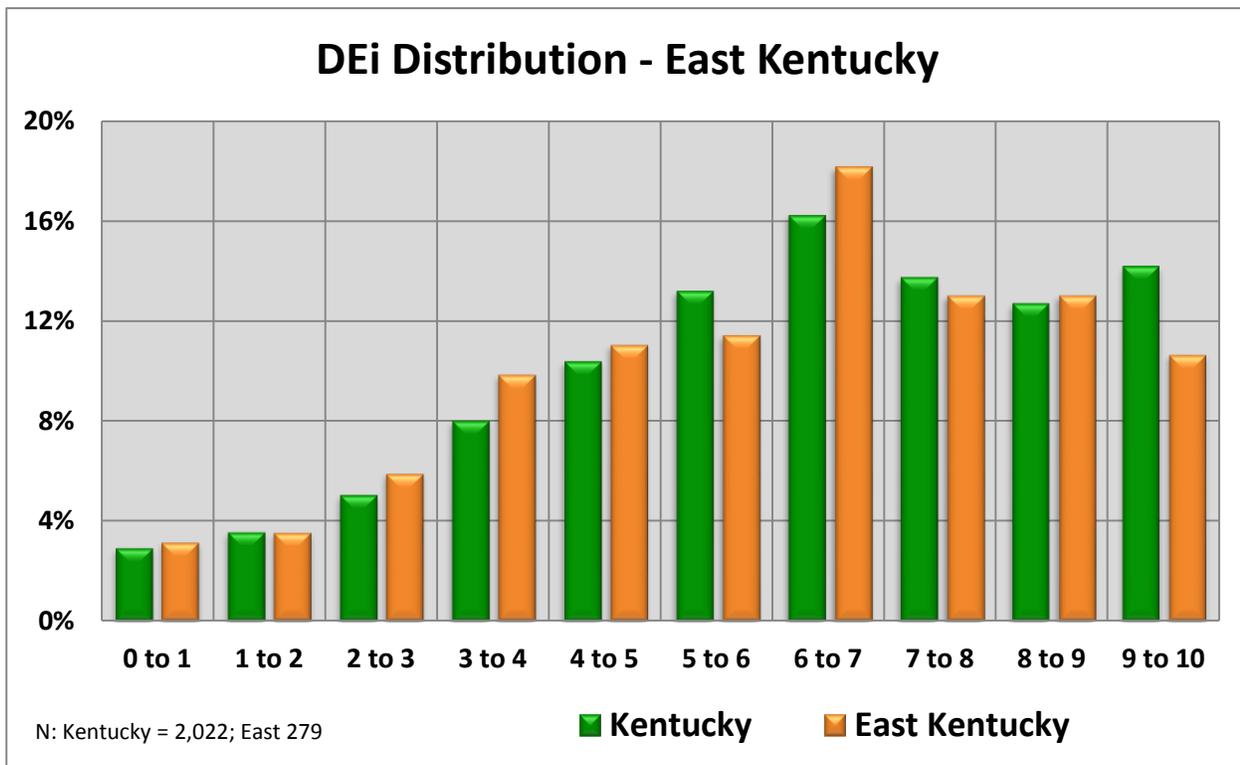
Age Distribution of Adults	East	Statewide
18 to 34 years	21.1%	22.6%
35 to 49 years	21.3%	20.7%
50 to 64 years	21.1%	19.8%
65 years and over	13.8%	13.3%

4.1 Utilization by Organizations in East Kentucky

Internet utilization by organizations in East Kentucky is moderately lower than the state average. The overall Digital Economy Index (DEi) for East Kentucky is 6.21 compared to the statewide DEi of 6.41. This ranks East Kentucky last out of the five regions. The profile of utilization levels from low (1) to high (10), mimics statewide patterns.

Median DEi Score		
Kentucky	East Kentucky	Ranking by Region
6.41	6.21	5

Figure 5: 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 can be seen in the following table:

Figure 6: Internet Utilization by Employment Size: East Kentucky

Organizations by Number of Employees	Kentucky DEi (Median)	East Kentucky DEi (Median)	Sample Size East Kentucky
1 to 4	5.83	5.73	112
5 to 49	6.41	6.07	110
50 to 99	6.8	6.41	18
100 or more	7.38	8.06	36
All Size Ranges	6.41	6.21	276

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 comprise over 95 percent of all organizations in East Kentucky.

Figure 7: Share of Labor Force by Size of Organizations

Number of Employees	East Kentucky
1 to 19	86.4%
20 to 49	9.2%
50 to 99	2.1%
100 to 499	2.1%
500 or more	0.2%

It is very informative to look at which industry sectors in East Kentucky vary in their Internet utilization levels from state-wide averages and how they compare to the other four regions. The following industries show relative **strength or weakness within East 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 8: Strong and Weak Utilization by Industry Sectors

Region	Strong (High DEi or Ranking)	Weak (Low DEi or Ranking)
East Kentucky	<ul style="list-style-type: none"> • Finance and Insurance 	<ul style="list-style-type: none"> • Public administration • Professional & Technical Services • Wholesale trade • Information Services

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

Figure 9: Summary of Utilization Levels by Industry Sector

Major Industry Category	Statewide	East Kentucky	Rank Compared to Other Regions
Finance & Insurance	7.5	7.77	2
Information	6.9	6.37	4
Educational Services	6.7	6.45	5
Manufacturing / Processing	6.6		
Retail Trade	6.4	6.02	4
Other services (exc. public admin)	6.3	6.51	3
Professional & Technical	6.2	5.67	4
Wholesale Trade	6.2	4.95	5
Construction	5.8		
Health Care & Social Assistance	5.7	5.87	2
Public Administration	5.2	4.47	5

4.1.1 Opportunities and Gaps Based on Utilization

The following is a list of industries that show the largest gaps in utilization for East 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 East Kentucky areas that have the greatest gaps in utilization, while also being growth sectors, are: Professional and Technical Services, Information Services and Wholesale Trade.

Figure 10: Gaps and Opportunities for Increasing Utilization by Industry Sector

Major Industry Category	East Region Variation from State Average	Sector Size - Rank	Growth Expectation
Health Care & Social Assistance	0.14	1	↑
Retail Trade	-0.12	2	↑
Mining		3	↓
Manufacturing / Processing		5	↑
Professional & Technical Services	-0.57	6	↑ ↑
Construction		8	↑ ↑
Wholesale Trade	-1.27	9	↑
Finance & Insurance	0.3	10	
Information	-0.53	13	↓
Public Administration	-0.7	n/a	
Gap 1 (0.6 or more below the state DEi)	2		
Gap 2 (0.6 to 0.3 below statewide DEi)	2		

**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 areas with significantly higher growth expectations.*

4.1.2 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 East Kentucky are similar to the rest of Kentucky, with privacy, slow Internet, high cost of development and maintenance, and lack of internal expertise the most frequently cited.

Figure 11: Barriers to Adopting Internet Applications and Processes

Barriers to e-Solutions - % Saying Important	East	Statewide
Privacy concerns	71.4%	71.4%
Available Internet is too slow	62.0%	59.2%
High cost of development/maintenance	48.3%	45.8%
Lack of internal expertise and knowledge	48.3%	45.8%
Loss of personal contact with clients	47.4%	45.1%
Suppliers not ready	43.2%	41.5%
Uncertain about benefits	28.2%	28.7%
Security concerns	27.4%	28.7%
Internal organization resistance	23.9%	24.6%
Products not suited to Internet sales	20.1%	24.9%

4.1.3 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 East Kentucky were more modest at 16.6 percent.

Figure 12: 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
East Kentucky	1,576	145	24	16.6%	43
Kentucky	15,657	1,731	593	34.3%	401

4.2 Households in East Kentucky

Utilization of the Internet by households in the East Kentucky is slightly lower than the state average. The overall Digital Economy Index (DEI) for households in East Kentucky is 5.95 compared to the statewide DEI of 6.1.

Figure 13: Utilization by Households: DEI Score and Regional Ranking

	Average DEI Score	Rank	Difference from Average	Households in Sample
East Kentucky	5.92	5	-.18	455
Statewide	6.1			4,122

4.2.1 Demographic Effects on Utilization

There are a number of factors that contribute to lower household utilization in East Kentucky. With a slightly older and less affluent population, it is no surprise that East Kentucky has households with lower than average computer skills and lower than 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 14: Impact of Age and Income on Internet Utilization

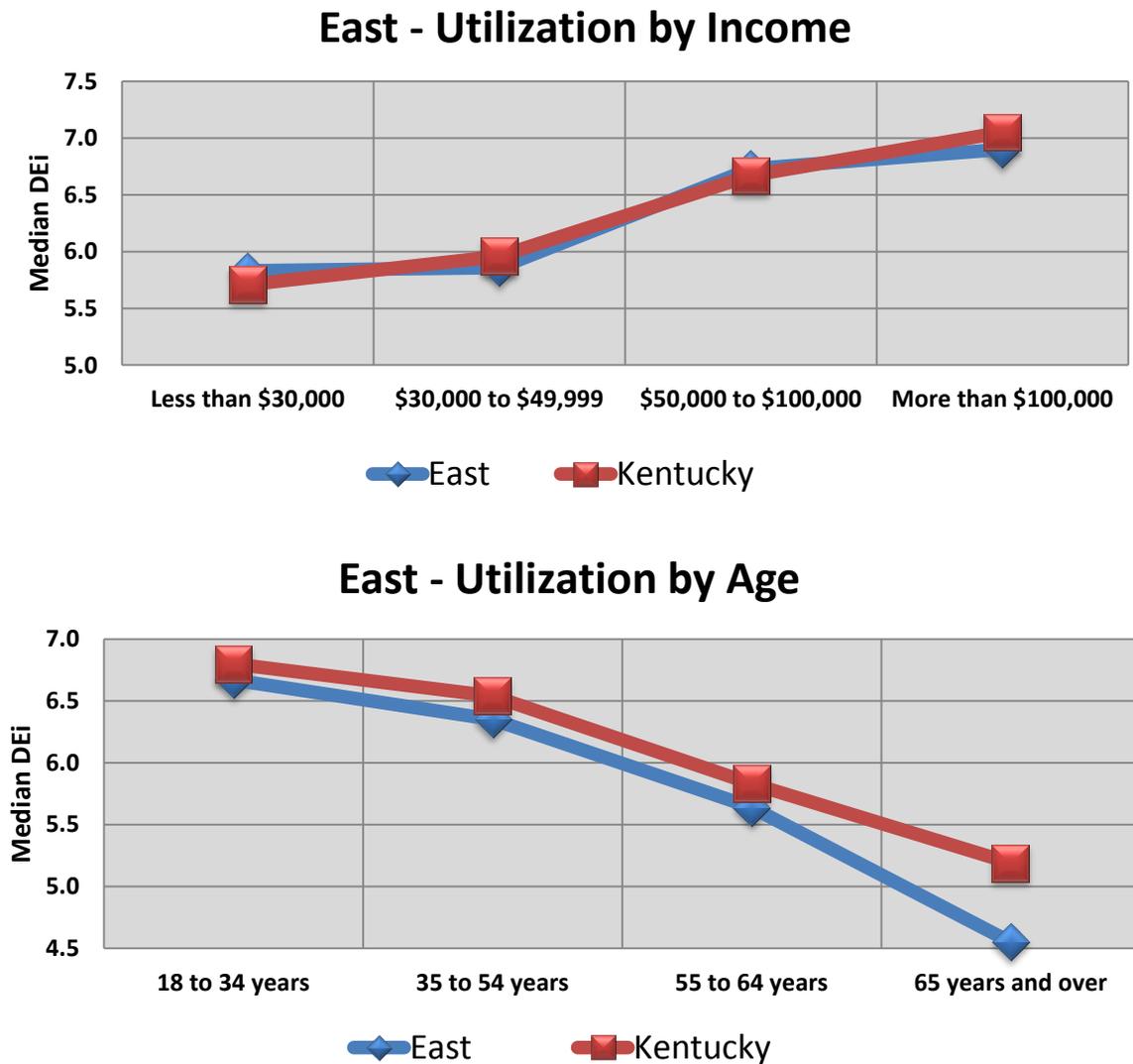
East Kentucky	Household Income			
Respondent Age	Less than \$30,000	\$30,000 to \$49,999	\$50,000 to \$100,000	More than \$100,000
18 to 34	5.98	6.59	7.23	6.87
35 to 54	5.47	5.99	6.59	6.36
55 to 64	4.72	5.89	5.34	5.39
65 years and over	4.94	3.82	4.94	5.86

Figure 15: Computer Skill Levels

	Expert user	Use computers with confidence	Know the basics
East Kentucky	24.0%	60.4%	15.4%
Statewide	25.6%	59.9%	14.1%

For East Kentucky, 15.4 percent of households “know only the basics” in computer skill. East 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 16: Internet utilization Levels by Age and Income



4.2.2 Use of Internet for Productivity

In terms of productivity, households in the East region show below average utilization for home businesses and teleworking, but above average utilization for training and education.

Figure 17: Percentage of Households Using the Internet for Productivity

East Kentucky	% Currently Engaged In	Statewide Average	Variance from State Average
Accessing workplace	56.2%	55.6%	+0.6%
Home business	17.0%	20.8%	-3.8%
Teleworking	16.7%	20.8%	-4.1%
Education or training	50.5%	45.9%	+4.6%

4.3 Focus on Project Area Priorities

The East Region has identified local government utilization as its priority focus. Consequently, this profile provides some insights into the performance of municipal and county governments. Sixty nine municipal and 50 county entities participated in the survey across Kentucky. Fourteen local governments from the East Region participated. Readers should keep in mind that the sample sizes for municipal and county governments are relatively small and should be used with caution. Nonetheless, the data on this priority area are suggestive and worth consideration.

Comparative analysis of how local governments use the Internet includes both generic Internet uses and uses specific to local government. The generic uses are measured through the same DEi as for all other organizations and businesses in Kentucky. A separate measure labeled DEi-G was created to compare use of the twelve additional e-solutions with specific relevance to local governments. Performance on nine of these twelve e-solutions can be found in Figure 20 later in this section.

Generally local governments have low levels of utilization of generic Internet applications and processes, with an average DEi of 5.32 compared to 6.42 for K-12 schools and 6.22 for organizations in Kentucky overall. Local governments in metropolitan areas (populations in excess of 50,000) have noticeably higher utilization of both generic e-solutions and government specific e-solutions, when compared to entities outside metropolitan areas. Moreover municipal entities areas have higher utilization than county entities.

Figure 18: County and Municipal Government - Utilization Characteristics

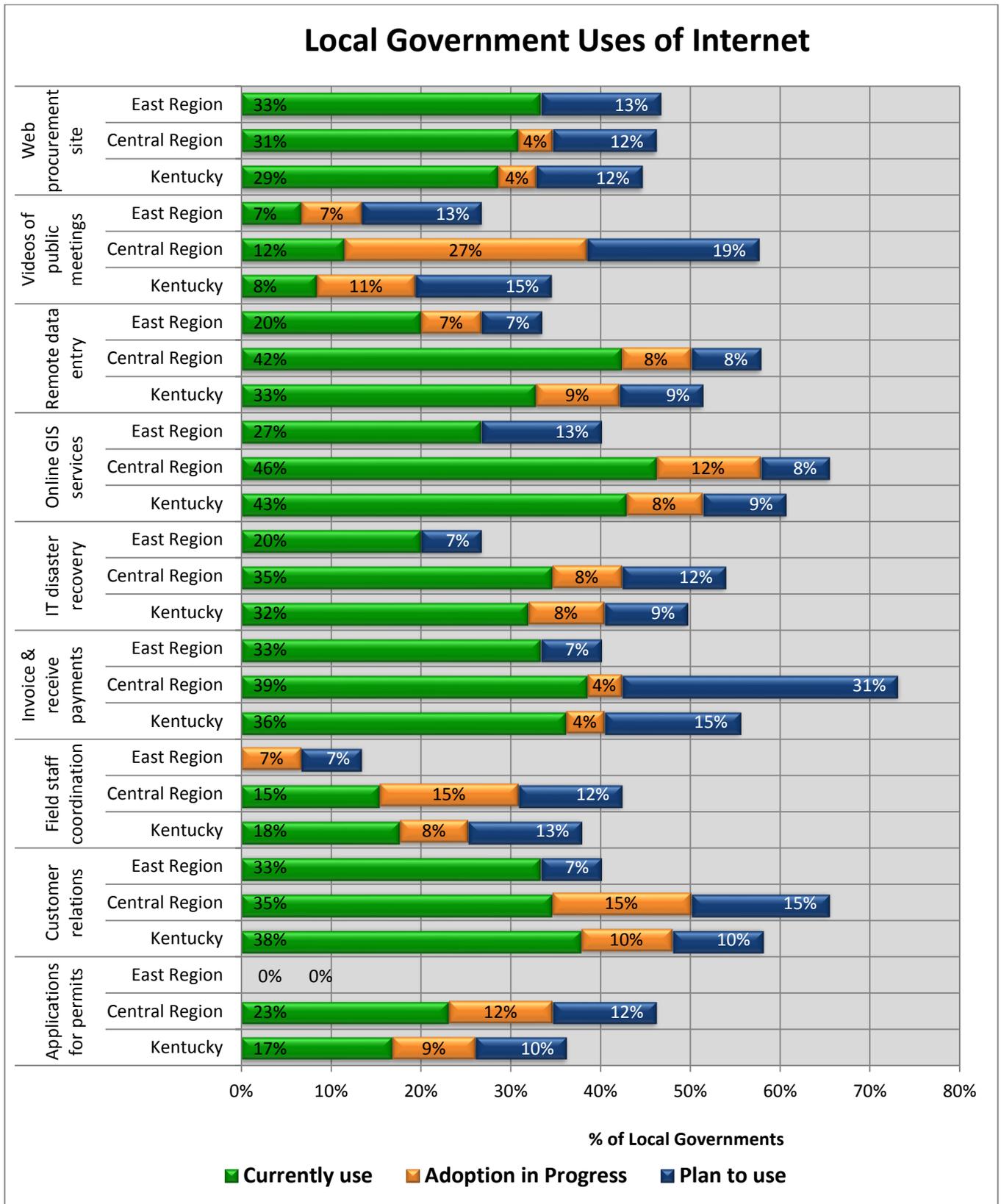
Utilization by Location and Type of Local Government		
Type of e-Solutions	Generic	Local Government Specific
	DEi	DEi-G
Municipal	5.54	4.60
County	4.79	4.48
Metropolitan	5.81	5.03
Non-metropolitan	4.93	4.38

Comparing regions, local governments in the East Region stand out as having the lowest utilization of e-solutions. Figures 19 and 20 compare the East Region to Kentucky overall, as well as to the Central Region. Local governments in the Central Region have high use of e-solutions, while also having socio-economic similarities to the East, thereby making a good basis for comparison.

Figure 19: County and Municipal Government - Utilization by Region

Utilization by Region by Type of e-Solutions		
	Generic e-Solutions	Local Government Specific
	DEi	DEi-G
Central	5.22	5.10
KY	5.19	4.55
East	4.51	3.08

Figure 20: Nine Local Government Uses of the Internet – Regional Comparison



As seen in Figure 20, the East Region has a far lower level of utilization of a number of specific Internet enabled processes and applications. While caution is required due to the small sample size, the data does suggest that local government entities in the East Region should look closely at how other local government entities are utilizing and benefiting from the Internet.

One approach that may be of particular interest to the East Region is growing use of collaboration and shared services among jurisdictions. This approach can compensate for a lack of internet staff resources, as well as restricted development and operating budgets. The contrast between the Central Region and the East Region in terms of collaboration is striking, with a number of entities in the Central Regional having already collaborating on shared services, with more actively considering such a step. In contrast, none of the East Region local government entities that participated in the survey are using or even actively considering shared services.

Figure 21: County and Municipal Government - Utilization Characteristics

Plans for shared services with other jurisdictions					
	Already collaborating	Actively considering	Considered & chose not to	Have not considered	Don't know
East	0.0%	0.0%	13.3%	26.7%	60.0%
Central	24.0%	12.0%	12.0%	28.0%	24.0%
Kentucky	9.4%	6.8%	10.3%	35.0%	38.5%



Appendix 1: Breakdown of Regions by County

<i>East</i>	<i>County</i>	<i>Population</i>	<i>Median Income</i>	<i>% in Poverty</i>	<i>Incidence of 65+</i>
Big Sandy	Floyd	39,451	29,725	30.3%	13.6%
	Johnson	23,356	32,063	22.9%	14.1%
	Magoffin	13,333	26,815	31.7%	12.9%
	Martin	12,929	25,825	45.0%	11.1%
	Pike	65,024	32,258	25.8%	13.7%
		154,093	31,343	28.3%	13.4%
Cumberland Valley	Bell	28,691	24,501	36.0%	15.7%
	Clay	21,730	22,255	43.3%	12.1%
	Harlen	29,278	26,356	33.4%	14.3%
	Jackson	13,494	25,634	30.7%	13.8%
	Knox	31,883	22,493	38.6%	14.6%
	Laurel	58,849	36,664	21.5%	12.9%
	Rockcastle	17,056	29,654	25.0%	14.8%
	Whitley	35,637	26,145	33.3%	14.3%
		236,618	26,713	32.7%	14.0%
Kentucky River	Breathitt	13,878	23,863	32.0%	13.4%
	Knott	16,346	29,375	23.7%	13.2%
	Lee	7,887	23,791	36.8%	13.2%
	Leslie	11,310	26,767	30.8%	14.2%
	Letcher	24,519	29,835	30.6%	14.2%
	Owsley	4,755	21,177	41.1%	16.8%
	Perry	28,712	29,660	27.7%	13.4%
	Wolfe	7,355	25,203	33.0%	15.6%
		114,762	\$26,209	32.0%	13.9%

Appendix 2: 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.

For more information about the contents in this document, please contact Project Management:

William Bates, Michael Baker Jr., Inc. -- 717.221.2065

Robert Lois, Deputy Project Manager, Michael Baker Jr., Inc. -- 724-495-4045

Baker



strategic
networks group
the broadband economists

Broadband *KY*

Central Kentucky Profile

Utilizations and Impacts of Broadband
for Businesses, Organizations and Households



This report was prepared by Strategic Networks Group in
partnership with Michael Baker Jr., Inc.



September 21st, 2012

Prepared for:

*Commonwealth of Kentucky Office of Broadband
Outreach and Development*



COMMONWEALTH OFFICE
OF BROADBAND OUTREACH
AND DEVELOPMENT
Promoting a 21st century economy



TABLE OF CONTENTS

1. Background, Summary and Recommendations	5
2. State-wide Recommendations	7
3. Starting Points	12
3.1 Organization and Objectives of the Report	12
3.2 Introducing the Digital Economy index (DEi).....	13
4. Project Area Profile: Central Kentucky	16
4.1 Utilization by Organizations in Central Kentucky	17
4.1.1 Opportunities and Gaps Based on Utilization	19
4.1.2 Barriers to Utilization.....	20
4.1.3 Impacts from Increasing Utilization.....	20
4.2 Households in Central Kentucky	21
4.2.1 Demographic Effects on Utilization	21
4.1.4 Use of Internet for Productivity.....	22
4.3 Focus on Project Area Priorities	23
Appendix 1: Breakdown of Regions by County	26
Appendix 2: Glossary.....	27
Figure 1: Kentucky Regions.....	11
Figure 2: Demographic and Economic Profile	16
Figure 3: Largest Economic Sectors in Central Kentucky.....	16
Figure 4: Age Profile of Central Kentucky.....	17
Figure 5: Range of Internet Utilization by DEi	17
Figure 6: Internet Utilization by Employment Size: Central Kentucky	18
Figure 7: Share of Labor Force by Size of Organizations	18
Figure 8: Strong and Weak Utilization by Industry Sectors	18
Figure 9: Summary of Utilization Levels by Industry Sector	19
Figure 10: Gaps and Opportunities for Increasing Utilization by Industry Sector.....	19
Figure 11: Barriers to Adopting Internet Applications and Processes.....	20
Figure 12: Job Creation and Internet Use in Commercial Enterprises	20
Figure 13: Utilization by Households: DEi Score and Regional Ranking	21
Figure 14: Impact of Age and Income on Internet Utilization	21
Figure 15: Computer Skill Levels.....	21
Figure 16: Internet utilization Levels by Age and Income	22
Figure 17: Percentage of Households Using the Internet for Productivity	22
Figure 18: Telework Levels by Region	23

Figure 19: Telework Levels by Type of Level of Urbanization 23
Figure 20: Teleworking by Industry 24
Figure 21: Motivations for Teleworking 24

This report is one of several deliverables that are part of the Kentucky Broadband Project of the Commonwealth Office of Broadband Outreach and Development (OBOD), and managed by Michael Baker Jr., Inc. (Baker). Ongoing project reporting, outreach, field work, surveys, data analysis and development and map production incorporate information relating to the Commonwealth's Broadband availability, utilization and adoption in specific regions, including characteristics such as service provider data and coverage areas, industry and business data, and household demographics. The project derives from the American Recovery and Reinvestment Act (ARRA) of 2009; funded from the State Broadband Initiative (SBI), and administered by the National Telecommunications and Information Association (NTIA) for a five-year period from 01/01/2010 to 12/31/2014.

For certain project components, Baker contracted with Strategic Networks Group (SNG) to administer user surveys, and to tabulate, analyze and develop reports based on the collected survey data. The Project Area Profile on the following pages was prepared by Strategic Networks Group under contract and in partnership with Michael Baker Jr. Inc.

This report is the second of two companion documents:

- 1) The Kentucky e-Strategy Report provides a state-wide analysis of utilization of the Internet. This state-wide perspective highlights trends that impact all regions to some degree. The report includes a comparative analysis of the Internet across the five regions of Kentucky: East, Central, West, North and Northeast. (See appendix for list of counties within each of the five regions).
- 2) The second set of documents consists of profiles for areas undertaking broadband planning initiatives in collaboration with the Kentucky Office of Broadband Outreach and Development (OBOD) and the Kentucky Council of Area Development Districts (KCADD). Recommendations from the Kentucky e-Strategy Report are reproduced in section 2 of each area profile, thereby providing a state-wide framework for local and regional broadband planning.

In addition to the documents noted above, the Office of Broadband Outreach and Development and the Kentucky Association of Area Development Districts can access online platforms that include databases on Internet use and impacts, as well as the underlying broadband infrastructure. These online platforms can provide customized reports on specific issues for defined geographic areas or sectors.

The area profiles focus on the specific opportunities and gaps for five geographic areas: **Central Kentucky (Lincoln Trail, Lake Cumberland and Barren River Area Development Districts)**, East Kentucky (Big Sandy, Cumberland Valley and Kentucky River Area Development Districts), Northeast Kentucky (Buffalo Trace, Gateway and FIVCO Area Development Districts), Purchase Area Development District, and North (KIPDA and Northern Kentucky, excluding Jefferson County).

In each of the geographic areas that are profiled, a broadband planning initiative is being undertaken on an issue specific to that region. In the Central Region, that issue is telework and the

creation of a qualified workforce for teleworking jobs. Section 4.3 of this profile provides data and analysis specifically on this issue. The other parts of this report include:

- **Sections 1 & 2: Background and Recommendations.** These two sections provide a state-wide perspective of issues related to broadband adoption and utilization. Section 2 includes Kentucky wide recommendations that provide a framework for local and regional broadband planning and efforts.
- **Section 3: Starting Points.** This section introduces basic concepts required for comparative analysis of broadband use in regions and sectors across Kentucky.
- **Section 4: Project Area Profile.** This section includes data and analysis specific to the project area – in this case the Central Region.

Those interested in a more detailed exploration of regional performance in broadband utilization are strongly encouraged to contact staff from OBOD and KCADD.

1. Background, Summary and Recommendations

Many communities and regions across Kentucky face significant challenges, among them economic dislocation and an aging population. Most rural areas face the additional challenge of population shifts from rural to urban areas. In the face of these challenges, how can communities and businesses maximize their competitiveness, while improving their quality of life?

One area with significant potential is broadband (essentially high-speed Internet access), which can be leveraged into tangible benefits for communities, businesses and households. Businesses can become more productive, competitive and reach into new markets. Households can access services more easily and often more cheaply. Governments can delivery services more cost effectively.

The first step in benefiting from broadband is acquiring connectivity or access to the Internet. Once access is acquired, the second step is adoption, whereby households, businesses and other organizations begin to use their high-speed Internet access on a regular basis.

The third stage in broadband development is utilization of the Internet in increasingly productive ways that bring concrete benefits, such as jobs, new savings and revenues, and improved quality of life. This report focuses on utilization as the third stage of broadband development.

The benchmarking of Internet utilization in Kentucky is based on data collected in February and March 2012. This report represents an analysis of this data from a regional perspective and is intended to support regional broadband planning.

Utilizing Broadband

The ability to utilize or leverage broadband varies significantly across businesses, organizations and households. Not all businesses or households have been able to turn the potential of broadband into measurable success in terms of jobs, company attraction and retention, increased tax base and revenues, and more efficient and effective citizen services. Turning potential into reality requires skills, training, and both formal and informal support, all in addition to access to broadband availability.

In those industry sectors and communities that already have a large, diverse and modern economy and work force, building broadband infrastructure may be sufficient to realize the potential of broadband. However, many industry sectors, communities, businesses and households have limited Internet related skills and capacity. For these groups, even with state-of-the-art connectivity, leveraging broadband often lags. The consequence is that these communities (and households and businesses) lose out on many of the benefit of broadband. More importantly, over time, these communities are at risk of becoming economically uncompetitive and generally less attractive to households and businesses.

This report examines how organizations and households in Central Kentucky differ in their utilization of broadband and where they can look to make improvements. The report shows in detail how industry sectors and household types in Central Kentucky compare to each other and to statewide patterns. The report provides insights and hard evidence that allow communities, businesses, and households to assess where they stand and to identify what kinds of actions will improve their performance and benefits.

The report includes statewide recommendations for how the Commonwealth of Kentucky and its regions can improve the utilization of broadband, thereby improving their economies and quality of life. Recommendations are broken down into three areas: gaps and opportunities where regions are lagging in their use of the Internet and broadband; key barriers to improving the use and benefits of Internet and broadband; and the best ways to build skills and abilities. Analysis and recommendations are identified for both organizations (commercial and non-commercial) and households. For the purposes of this report, regional analysis has been organized into five distinct regions of Kentucky: North, Northeast, East, West, and Central. The composition of these five regions is outlined in Appendix 1.

*This report uses data collected in February through April 2012 across Kentucky. A total of 2,231 organizations and 4,122 households contributed to the state-wide broadband benchmarking effort. The sample for Central Kentucky is 443 organizations and 735 households.**

* A summary of the findings from the 2012 benchmarking effort can be found in the *Broadband KY e-Solutions Benchmarking Technical Report* (May 2012). The number of responses collected in this analysis is substantial, especially when compared to national polls.

2. State-wide Recommendations

To assist stakeholders and communities to better understand and use this report, the recommendations of the Kentucky e-Strategy Report were structured around fundamental questions that leaders and decision-makers face in terms of leveraging broadband for the socio-economic benefit of their communities and constituents.

1. How important is high-speed Internet access to Kentucky, its communities and its residents?

In the twenty-first century, high-speed Internet access has been 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 high-speed Internet access speaks directly to a community's viability, competitiveness and quality of life. However, each region and community has its own unique characteristics, assets and challenges. Current Internet usage and opportunities for development vary widely, as explored in detail in the various sections of this report. Each region requires strategies and initiatives that address its unique situation. The Commonwealth can provide support, but social and economic developments are essentially local and regional in nature.

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.

Benchmarking Data for Kentucky, May 2012.

Recommendation #1: *Each region or groups of communities must develop its own strategy and initiatives based on its own characteristics, values and priorities.*

2. Where are the major gaps or weaknesses in utilization of the Internet?

Prioritizing industry sectors and other economic groups must be done within a regional context. Additional factors and considerations exist within each region, such as key industry sectors in decline or regional strategies for developing specific sectors. In general, focus should be on industry sectors that make the largest contribution to the economy and that have the greatest growth potential.

Key gaps in Internet utilization are focused on household income, age, and skill level, degree of "rurality", and organizational size and industry sector.

Recommendation #2: *Focus on high opportunity industry sectors within each region rather than undertaking broad but untargeted initiatives.*

3. How do we use the potential of the Internet to maximize job creation?

Small to medium sized organizations should be a focus for all regions. This segment is important for the following reasons:

- Includes 95% of all establishments and 43% of all employment in Kentucky
- Has the lowest or weakest utilization levels compared to organizations with larger numbers of employees
- Is a dynamic engine for employment growth, especially through use of the Internet
- Has the least capacity and expertise to adopt more sophisticated and productive Internet applications

Recommendation #3: *Focus on the small-medium enterprise segment, especially 1-49 employees, to increase Internet utilization, thereby driving competitiveness, revenues and job creation.*

4. In what areas do small to medium sized business need help?

Broadband KY e-Solutions Benchmarking (eSB) identifies which types of Internet enabled applications and processes are relatively easy or hard to adopt, especially by small to medium sized organizations. Using data on barriers to adoption, action plans can be defined at the regional level to address target groups. Note: e-solutions is the term used in this report 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.

Recommendation #4: *Initiatives aimed at increasing utilization among the small to medium enterprise segment should focus on the following 10 utilization categories:*

1. *Delivery of services and content*
2. *Rich media or service creation¹*
3. *Teleworking*
4. *Staff training and skills development*
5. *Advertising and promotion*
6. *Social networking*
7. *Government transactions*
8. *Customer service and support*
9. *Selling goods or services*
10. *Supplier communication and coordination*

¹ Rich media describes Web pages that use advanced technology such as streaming video, downloaded programs that interact instantly with the user for advertising.

5. How can we reach households that have not adopted the Internet or use it only minimally?

Many households that use the Internet still do not use the Internet very productively. Low utilization households are very similar to non-adopting households. They are disproportionately older and lower income. Households with low Internet adoption represent an important group due to the social and economic benefits that can be accessed through the Internet. As governments and businesses move their services to the Internet to achieve better reach and cost efficiencies, it is increasingly important that citizens have the ability to access and benefit from these online services. However, a large portion of lower income and older households have difficulty adopting and using the Internet. Given that low adoption and utilization is strongly tied to age and income, training should be targeted at people over 64 and households with lower incomes.

The poorer one is and the older one is, the less likely one uses the Internet and the less productively one uses it.

Recommendation #5: *Develop training programs and resources that target households over the age of 64 or have below average incomes.*

6. Is it true that the rural areas have a particularly hard time in adopting and using the Internet?

Yes! While both urban and rural households struggle to use and benefit from the Internet, information in Sections 4.2 reveal that rural households are relatively disadvantaged, with households being generally older and having lower average incomes. Table 27 shows non-metropolitan areas with significantly lower utilization levels compared to metropolitan areas. Consequently, non-metropolitan households tend to have greater difficulty in accessing educational, health and government services, all of which are increasingly available online.

Recommendation #6: *Non-metropolitan areas are a priority for Internet training programs and resources.*

Rather than trying to entice target populations into existing programs (such as classroom courses), Internet training initiatives should reflect the preference for both self-directed online resources, as well as existing informal networks that already have participation by these target groups. These can include seniors' centers, libraries, churches and community centers.

7. How can we help citizens of Kentucky make better use of the Internet?

Rather than trying to entice target populations into existing programs (such as classroom courses), e-solution adoption initiatives should reflect the preference for both self-directed online resources, as well as existing informal networks that already have participation by these target groups. These can include seniors' centers, libraries, churches and community centers.

Recommendation #7: In designing initiatives to increase and improve Internet utilization by households and organizations, considerable weight should be given to those learning methods that are preferred by the target populations.

The preferred learning methods of 47% of those over 65 in Kentucky are “talking to others” and “online information”. The least preferred learning methods were “workshops” and “classrooms courses” (preferred by 16%).

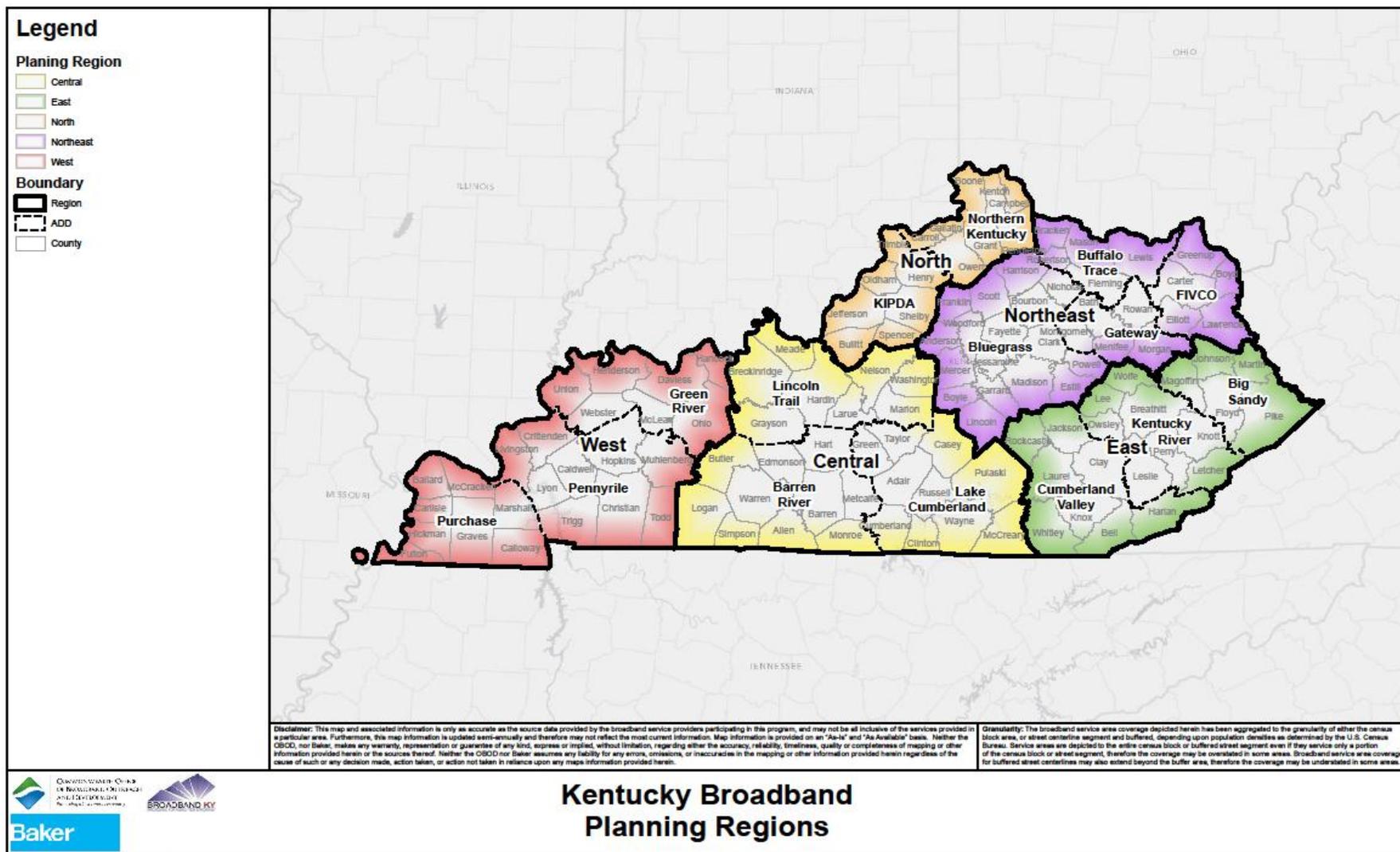
8. How can those who do not use the Internet be assisted to start using the Internet in ways that produce tangible benefits?

Approximately one in five individuals in Kentucky does not use or benefit from the Internet. The largest group of non-Internet users are those 65 years and older. However, lower income households also have significantly lower rates of Internet adoption.

Barriers to Internet adoption vary significantly by type of household. Almost half of non-adopting older households see little value in the Internet, while generally being less skilled in use of computers and Internet. Working age individuals tend to have better computer and Internet skills, but find having Internet at home too expensive. These working age ‘non-adopters’ are more likely to have children at home and have at least one other person in the household who uses the Internet. These working age households are less likely to be completely isolated from the Internet.

Recommendation #8: *Broadband adoption programs should focus on those key groups that face persistent barriers to adoption, specifically elderly households and lower income households where no-one else in the household uses the Internet. Internet adoption programs should be design to address specific barriers facing their targeted group.*

Figure 1: Kentucky Regions



Map data current as of December 31, 2011

3. Starting Points

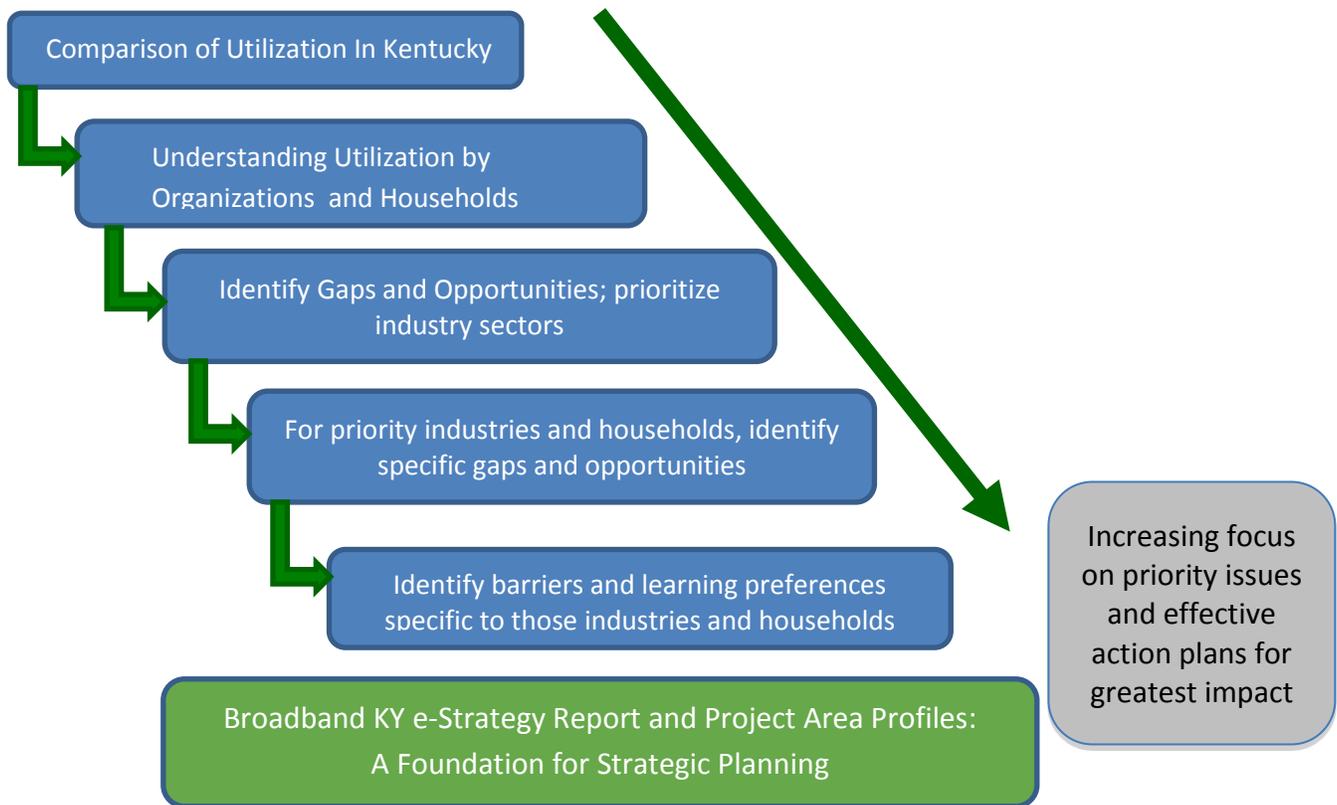
3.1 Organization and Objectives of the Report

This report is designed to be a catalyst for leveraging broadband through actionable intelligence. The chart below outlines steps used in this report to move from descriptive data to detailed analysis of targets, priorities and strategies. The ultimate goal of the analysis of broadband in Kentucky is to:

1. Identify which segments of the regional economy utilize the Internet to a greater or lesser degree;
2. Prioritize the segments that show utilization gaps based on importance to the regional economy and opportunity to address the gaps; and,
3. Identify specific uses of the Internet that should be addressed to close the gaps, resulting in effective actions that are targeted where they will have the most impact.
4. Identify the barriers to improved Internet utilization, as well as the best means to overcome them.

For those interested in a more detailed exploration of regional performance in broadband utilization, you are strongly encouraged to contact regional outreach staff from the Kentucky Office for Broadband Outreach and Development.

Leveraging Broadband for Economic and Social Development



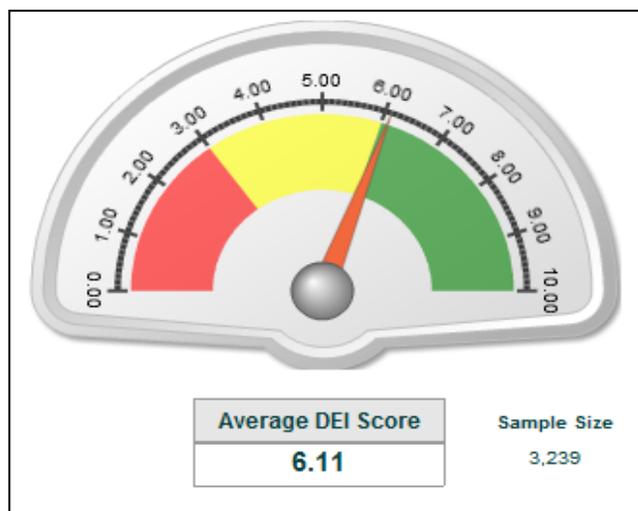
3.2 Introducing the Digital Economy index (DEi)

This report includes comparisons of Internet use between regions by various characteristics, such as industry, business size, and household demographics. To assist in the process of making comparisons, a mechanism was developed for establishing benchmarks. Benchmarks are useful in creating reference points against which the performance of any individual or group can be compared. Strategic Networks Group has developed a benchmarking process based on its Digital Economy index (DEi).

The Digital Economy index (DEi) reflects an organization’s or household’s utilization of a range of Internet applications and process – 17 for organizations and 30 for households. These applications and processes (e-solutions) are listed on the following pages. 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. A separate DEi is used to compare how different types of households use the Internet.

An organization’s or household’s DEi score (from 0 to 10) captures that their utilization of e-solutions, with 10 being the highest possible use. DEi scores are averaged across groups of users by various categories: e.g. a sector’s DEi is the average for all organizations in that sector. The DEi is used as a basis for comparison of utilization levels across various dimensions.

Identifying variations in DEi assists in focusing on areas where a deeper assessment is warranted. In areas where DEi is lower than average, indicating lower utilization, there is an opportunity to increase utilization and benefits to organizations and households.



DEi Meter from dashboard of the Digital Economy Analytics Platform.

The Color Coding for DEi Scores: To better show how industry sectors perform, the DEi tables in this report are color coded from the highest (green) to lowest (red) to highlight how DEi scores compare. The color coding (green to red) allows one to quickly compare groups based on how utilization varies.

Highest
2
3
4
5
6
Lowest
Insufficient Data

Different DEi comparisons can be useful for different purposes, for example:

- Individual organizations can compare their DEi score with a benchmark average DEi score for their industry in their region. This can provide insights into how well an organization is performing in terms of Internet use compared to their peers.

- Broadband planners and economic development agencies can compare DEi benchmarks between different organization characteristics, such as industries and business sizes, to gain insights into relative utilization levels to aid in targeting low utilization groups. They can also compare DEi benchmarks on a regional basis to aid in planning.
- Providers of broadband services and infrastructure can use DEi benchmarks to gain insights into where high utilization levels exist and where low utilization level need to be addressed in order to promote the greatest use from their broadband investments.

e-Solutions refer 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-Solutions Categories for Households	
Communication	Transactions
E-mail	Buying goods or services
Voice over IP	Selling items
Online chat	Investments / trading
Sharing information	Online banking
Personal website	Paying bills
Productivity	Government services
Education or training courses	Music or video download
Accessing workplace	Software download
Teleworking	Booking travel
Home business	Research
Recreation	Product information
News and sports	Investments
Listen to radio	Government information
Watch TV programs	Community events
Watch movies	Education and training
Online gaming	Health information
	Travel information

e-Solutions Categories for Organizations	
<i>e-Commerce Related</i>	<i>e-Process Related</i>
Selling goods or services	Purchasing goods or services
Deliver services and content	Supplier communication and coordination
Rich media or service creation	Electronic document transfer
Customer service and support	Staff training and skills development
Advertising and promotion	Teleworking
Social networking	Accessing collaborative tools
Web site for organization	Banking and financial
Research by staff	Government transactions
	Access government information

4. Project Area Profile: Central Kentucky

This section provides a profile of Internet utilization in the Central Region, consisting of the Lincoln Trail, Lake Cumberland and Barren River Area Development Districts. Most of the material is taken from the Kentucky e-Strategy Report and consolidated into one area-specific profile. Some additional material has been added to provide a more detailed picture and to reflect the priority that area stakeholders have given to the issue of telecommuting.

For context in prioritizing regional planning activities it is important to consider the overall profile of the population and economy of Central Kentucky.

Figure 2: Demographic and Economic Profile

Households	Central Kentucky	Kentucky
Population	760,568	4,339,367
Median Household Income	\$36,941	\$40,061
% in Poverty	20.7%	18.4%
% of Population 65+	13.9%	13.3%
Organizations		
Establishments	14,362	90,511
Employment	206,895	1,480,658
Annual Payroll (in billions)	\$5.95	\$51.44
Average Size of Employer	14.4 employees	16.4 employees
USCB County Business Patterns 2009		

Central Kentucky has below average (median) income and has an age profile similar to the state. At 20.6% of employment and 25.5% of payroll, manufacturing plays a large role, compared to statewide levels of 15.1% and 18.6% respectively. The manufacturing sector consists primarily of larger than average establishments, with only 4.3% of all businesses classified as manufacturing. The eight largest industries, ranked by annual payroll, that collectively represent over 75 percent of the economy in Central Kentucky are:

Figure 3: Largest Economic Sectors in Central Kentucky

Rank	Industry Sector	Percent Employment
1	Manufacturing / Processing	20.6%
2	Retail Trade	16.2%
3	Health Care & Social Assistance	16.1%
4	Accommodation & food services	10.2%
5	Construction	4.6%
6	Administrative & Support Services	4.0%
7	Other services (exc. public admin)	3.4%
8	Professional & Technical Services	3.0%
% Employment	78.1%	
% of Payroll	75.2%	

% of Establishments	76.3%
---------------------	-------

Figure 4: Age Profile of Central Kentucky

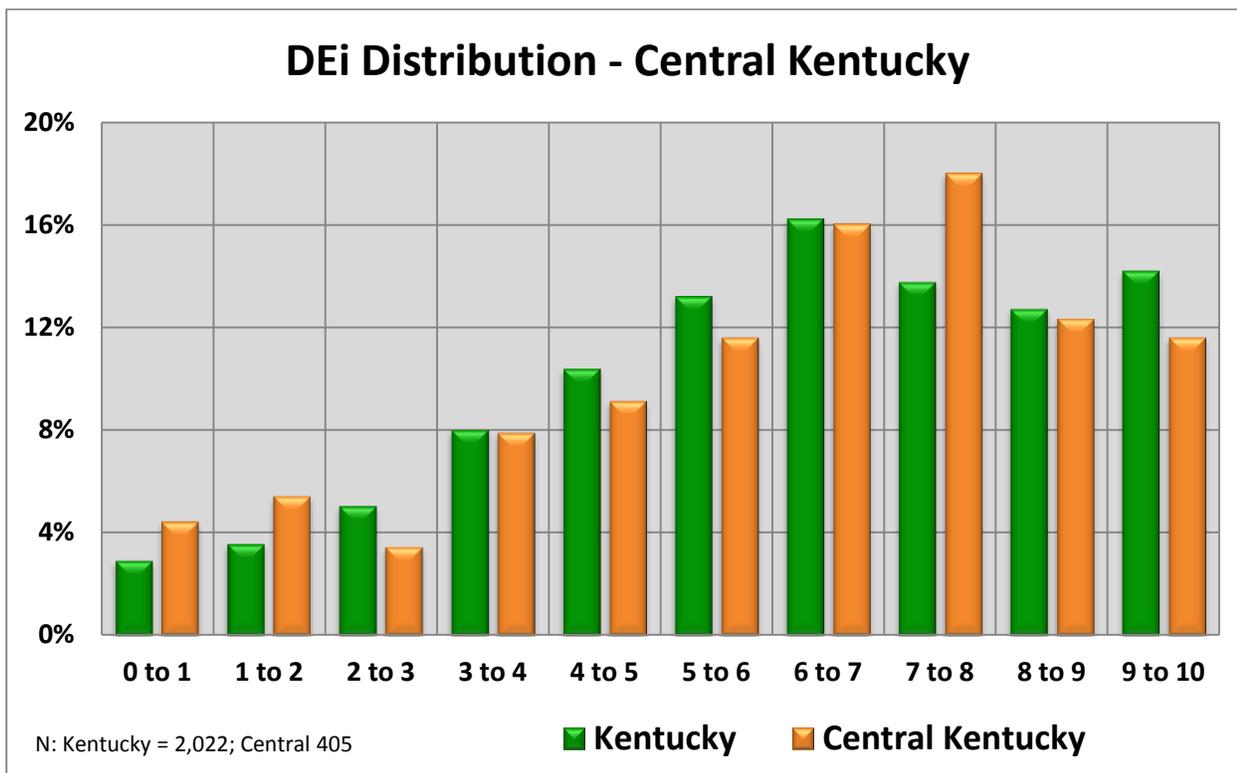
Age Distribution of Adults	Central	Statewide
18 to 34 years	22.2%	22.6%
35 to 49 years	20.4%	20.7%
50 to 64 years	19.5%	19.8%
65 years and over	13.9%	13.3%

4.1 Utilization by Organizations in Central Kentucky

Internet utilization by organizations in Central Kentucky is moderately higher than the state average. The overall Digital Economy Index (DEi) for Central Kentucky is 6.6 compared to the statewide DEi of 6.41. This ranks Central Kentucky second out of the five regions. The profile of utilization levels from low (1) to high (10), mimics statewide patterns, though Central Kentucky has a noticeably higher number of organizations with slightly higher than average utilization usage (DEi).

Median DEi Score		
Kentucky	Central Kentucky	Ranking by Region
6.41	6.60	2

Figure 5: 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 can be seen in the following table:

Figure 6: Internet Utilization by Employment Size: Central Kentucky

Organizations by Number of Employees	Kentucky DEi	Central Kentucky DEi	Sample Size Central Kentucky
1 to 4	5.83	5.92	121
5 to 49	6.41	6.99	195
50 to 99	6.80	6.99	36
100 or more	7.38	6.8	32
All Size Ranges	6.41	6.6	384

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 over 95 percent of organizations in Central Kentucky. Notably, Central Kentucky has the highest incidence of small businesses among Kentucky’s five regions.

Figure 7: Share of Labor Force by Size of Organizations

Number of Employees	Central Kentucky
1 to 19	87.2%
20 to 49	8.3%
50 to 99	2.3%
100 to 499	1.9%
500 or more	0.3%

It is very informative to look at which industry sectors in Central Kentucky vary in their Internet utilization levels from state-wide averages and how they compare to the other four regions. The following industries show relative **strength or weakness within Central 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 8: Strong and Weak Utilization by Industry Sectors

Region	Strong (High DEi or Ranking)	Weak (Low DEi or Ranking)
Central Kentucky	<ul style="list-style-type: none"> Wholesale Trade 	<ul style="list-style-type: none"> Manufacturing Health Care & Social Assistance Professional & Technical Services

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

Figure 9: Summary of Utilization Levels by Industry Sector

Major Industry Category	Statewide	Central Kentucky	Rank Compared to Other Regions
Finance & Insurance	7.5	7.5	3
Information	6.9	7.0	2
Educational Services	6.7	6.6	4
Manufacturing / Processing	6.6	6.1	3
Retail Trade	6.4	6.2	3
Other services (exc. public admin)	6.3	6.0	4
Professional & Technical	6.2	5.8	3
Wholesale Trade	6.2	6.9	1
Construction	5.8	5.7	4
Health Care & Social Assistance	5.7	5.3	5
Public Administration	5.2	5.4	2

4.1.1 Opportunities and Gaps Based on Utilization

The following is a list of industries that show the largest gaps in utilization for Central 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 Central Kentucky areas that have the greatest gaps in utilization, while also being growth sectors, are: Manufacturing, Health Care and Social Assistance and Professional and Technical Services.

Figure 10: Gaps and Opportunities for Increasing Utilization by Industry Sector

Major Industry Category	Central	Sector Size - Rank	Growth Expectation
Manufacturing / Processing	-0.45	1	↑
Retail Trade	-0.12	2	↑
Health Care & Social Assistance	-0.47	3	↑
Construction	-0.2	5	↑ ↑
Professional & Technical Services	-0.47	8	↑ ↑
Wholesale Trade	0.67	9	↑
Finance & Insurance	0.06	10	
Information	0.1	13	↓
Public Administration	0.18	n/a	
Gap 1 (0.6 or more below the state DEi)	0		
Gap 2 (0.6 to 0.3 below statewide DEi)	3		

**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 areas with significantly higher growth expectations.*

4.1.2 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 Central Kentucky are similar to the rest of Kentucky, with privacy, slow Internet and lack of internal expertise the most frequently cited.

Figure 11: Barriers to Adopting Internet Applications and Processes

Barriers to e-Solutions - % Saying Important	Central Kentucky	Statewide
Privacy concerns	71.3%	71.4%
Available Internet is too slow	59.9%	59.2%
Lack of internal expertise and knowledge	46.2%	45.8%
High cost of development/maintenance	45.1%	45.8%
Loss of personal contact with clients	44.8%	45.1%
Suppliers not ready	37.9%	41.5%
Security concerns	28.4%	28.7%
Products not suited to Internet sales	28.1%	24.9%
Uncertain about benefits	27.0%	28.7%
Internal organization resistance	24.8%	24.6%

4.1.3 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 Central Kentucky were more modest, but still impressive at 27.3 percent.

Figure 12: 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
Central Kentucky	2,130	194	53	27.3%	73
Kentucky	15,657	1,731	593	34.3%	401

4.2 Households in Central Kentucky

Utilization of the Internet by households in the Central Kentucky is slightly lower than the state average. The overall Digital Economy Index (DEi) for households in Central Kentucky is 5.95 compared to the statewide DEi of 6.1.

Figure 13: Utilization by Households: DEi Score and Regional Ranking

	Average DEi Score	Rank	Difference from Average	Households in Sample
Central Kentucky	5.95	3	-0.15	455
Statewide	6.1			4,122

4.2.1 Demographic Effects on Utilization

There are a number of factors that contribute to lower household utilization in Central Kentucky. With a slightly older and less affluent population, it is no surprise that Central Kentucky has households with lower than average computer skills and lower than 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 14: Impact of Age and Income on Internet Utilization

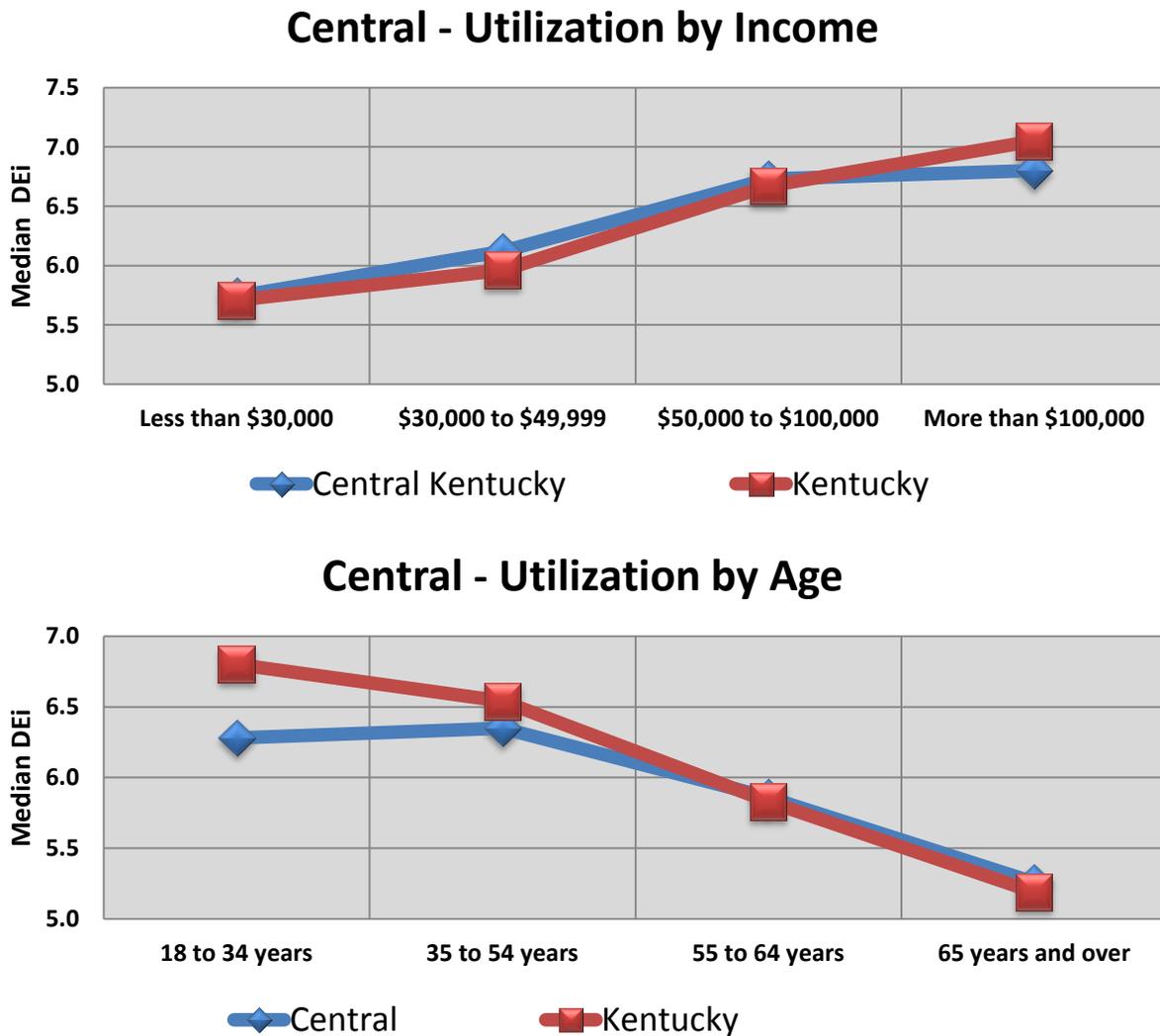
Central Kentucky	Household Income			
Respondent Age	Less than \$30,000	\$30,000 to \$49,999	\$50,000 to \$100,000	More than \$100,000
18 to 34	5.90	5.85	7.20	7.18
35 to 54	5.81	5.96	6.78	6.92
55 to 64	4.39	5.89	6.14	5.96
65 years and over	4.79	4.25	5.91	6.46

Figure 15: Computer Skill Levels

	Expert user	Use computers with confidence	Know the basics
Central Kentucky	22.3%	60.6%	16.6%
Statewide	25.6%	59.9%	14.1%

For Central Kentucky, 16.6 percent of households only “know the basics” in computer skill. Central 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 16: Internet utilization Levels by Age and Income



4.1.4 Use of Internet for Productivity

In terms of productivity, households in the Central Region show above average utilization for activities such as training, accessing their work place from home and home based businesses, but not for teleworking.

Figure 17: Percentage of Households Using the Internet for Productivity

Central Kentucky	% Currently Engaged In	Statewide Average	Variance from State Average
Accessing workplace	51.2%	55.6%	-4.4%
Home business	21.5%	20.8%	+0.7%
Teleworking	18.6%	20.8%	-2.2%
Education or training	48.9%	45.9%	+4.0%

4.3 Focus on Project Area Priorities

The Central Region has identified teleworking as its priority focus. This profile provides some insights into the characteristics of telework households in the region. The state benchmarking survey collected data on teleworking through two sets of questions. The first question asked how households used the Internet for “productivity” purposes: telework, home business, and accessing one workplace from home. Based on this broad categorization, 21.4 percent of households in the central Region stated that they use the Internet to telework – roughly the same as the Kentucky average. These households were then asked if one or more household members telework under the following definition:

“Teleworking is considered to be working from home during normal working hours as part of an ongoing arrangement with your employer. Teleworking may be part of the time (one or more days per week) or all of the time. Teleworkers typically have access to company resources online (e.g., company Intranet) with the ability to work from home in the same manner that they would in their company location. Occasional access to work or doing work from home after normal working hours is not considered teleworking.”

Based on this narrower definition, of the original households that identified themselves as teleworking, less than 50 percent confirmed that they telework. This profile examines the 66 households (9.9%) in the Central Region that telework. The level of teleworking in the Central Region is similar to the East and West Regions, but markedly lower than the North and Northeast Regions.

Figure 18: Telework Levels by Region

Region	Percent of Households in Region that Telework	Sample Size
Central	9.9%	66
East	9.3%	38
North	17.0%	109
Northeast	14.1%	156
West	9.0%	84

Within the Central Region, teleworkers come from both large and small communities, with metropolitan areas have the least amount of teleworkers as a proportion of their population.²

Figure 19: Telework Levels by Type of Level of Urbanization

Rural-Urban Dimensions of Teleworking	% of Households Teleworking in the Area
Metropolitan (50,000 +)	7.8%
Micropolitan (10,000 to 49,999)	11.3%
Small Town (2,500 to 9,999)	11.7%
Isolated Small Town (remainder)	10.6%

² The levels of urbanization are defined by the Census Bureau as: A metropolitan area has a core urban area of over 50,000 with a population density greater than 1,000 people per square mile; a micropolitan area has a population of 10,000 to 49,999; a small town has a population of 2,500 to 9,999; the category of “isolated small town” includes the remainder.

To further understand teleworking, it is instructive to identify the types of sectors that teleworkers belong to. Figure 20 identifies Government, Professional & Technical Workers, and Educational Services as the sectors most likely to have teleworkers in the Central Region.

Figure 20: Teleworking by Industry

Teleworker Industry	Distribution of Teleworking Households	# Households
Government	15.2%	10
Professional & Technical Services	13.6%	9
Educational Services	10.6%	7
Unidentified	9.1%	6
Health Care & Social Assistance	7.6%	5
Information	7.6%	5
Other services	6.1%	4
Real Estate	6.1%	4
Finance & Insurance	4.5%	3
Retail Trade	4.5%	3
Administrative & Support Services	3.0%	2
Agriculture / Forestry / Fishing	3.0%	2
Manufacturing / Processing	3.0%	2
Other	6.0%	4

To the extent that the region has prioritized teleworking as an economic development strategy, it is useful to understand the motivations of teleworkers. Of the 66 telework households in the Central Region, the dominant motivations include quality of life (family, life/work balance, and health) and finances (cost savings, productivity, and more employment options). See Figure 21 for a detailed breakdown.

Figure 21: Motivations for Teleworking

Teleworking Benefits	% of households saying important or very important
More family time	96.6%
Cost savings	94.9%
Life-work balance	93.2%
More productive	89.8%
Reduce commuting time	86.4%
Health and well-being	86.4%
More community time	84.7%
More employment options	72.9%
Environmental benefits	67.8%



Appendix 1: Breakdown of Regions by County

Central	County	Population	Median Income	% in Poverty	Incidence of 65+
Barren River	Allen	19,956	36,563	17.9%	14.7%
	Barren	42,173	35,993	19.7%	17.6%
	Butler	12,690	33,499	20.1%	15.8%
	Edmonson	12,161	33,550	20.8%	16.6%
	Hart	18,199	29,989	25.3%	14.9%
	Logan	26,835	37,329	18.4%	15.7%
	Metcalfe	10,099	29,626	23.6%	16.3%
	Monroe	10,963	26,650	26.5%	17.1%
	Simpson	17,327	40,357	15.1%	14.3%
	Warren	113,792	43,316	17.1%	10.9%
		284,195	\$34,687	20.5%	14.0%
Lincoln Trail	Breckinridge	20,059	37,074	20.8%	15.6%
	Grayson	25,746	31,936	21.0%	15.1%
	Hardin	105,543	45,358	14.7%	11.0%
	Larue	14,193	40,679	16.8%	15.6%
	Marion	19,820	35,609	20.6%	13.0%
	Meade	28,602	42,922	12.4%	10.4%
	Nelson	43,437	43,498	15.8%	11.7%
	Washington	11,717	39,742	16.6%	15.9%
		269,117	\$39,602	17.3%	12.4%
Lake Cumberland	Adair	18,656	29,200	24.0%	15.3%
	Casey	15,955	27,247	25.8%	16.1%
	Clinton	10,272	25,776	27.1%	16.6%
	Cumberland	6,856	26,913	25.2%	19.1%
	Green	11,258	31,189	23.5%	17.3%
	McCreary	18,306	23,163	35.4%	12.3%
	Pulaski	63,063	32,038	19.5%	16.2%
	Russell	17,565	29,421	25.3%	17.4%
	Taylor	24,512	33,601	22.4%	16.0%
	Wayne	20,813	27,210	27.3%	16.0%
		207,256	\$28,576	25.6%	16.0%

Appendix 2: 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.

For more information about the contents in this document, please contact Project Management:

William Bates, Michael Baker Jr., Inc. -- 717.221.2065

Robert Lois, Deputy Project Manager, Michael Baker Jr., Inc. -- 724-495-4045

Baker



strategic
networks group
the broadband economists

Broadband KY

North Region - Kentucky Profile

Utilizations and Impacts of Broadband
for Businesses, Organizations and Households



This report was prepared by Strategic Networks Group in partnership with Michael Baker Jr., Inc.



September 24, 2012

Prepared for:

Commonwealth of Kentucky Office of Broadband Outreach and Development



COMMONWEALTH OFFICE
OF BROADBAND OUTREACH
AND DEVELOPMENT
Promoting a 21st century economy



TABLE OF CONTENTS

1. Background, Summary and Recommendations	5
2. State-wide Recommendations	7
3. Starting Points	12
3.1 Organization and Objectives of the Report	12
3.2 Introducing the Digital Economy index (DEi).....	13
4. Project Area Profile: North Kentucky	16
4.1 Utilization by Organizations in North Kentucky	17
4.1.1 Opportunities and Gaps Based on Utilization	20
4.1.2 Barriers to Utilization.....	20
4.1.3 Impacts from Increasing Utilization.....	21
4.2 Households in North Kentucky.....	21
4.2.1 Demographic Effects on Utilization	21
4.2.2 Use of Internet for Productivity.....	23
Appendix 1: Breakdown of Regions by County	25
Appendix 2: Glossary	26
Appendix 3 - 7: Regional Provider Service Maps & Directory	Attachments
Figure 1: Kentucky Regions	11
Figure 2: Demographic and Economic Profile	16
Figure 3: Largest Economic Sectors in North Kentucky.....	16
Figure 4: Age Profile of North Kentucky.....	17
Figure 5: Range of Internet Utilization by DEi	17
Figure 6: Internet Utilization by Employment Size: North Kentucky	18
Figure 7: Share of Labor Force by Size of Organizations.....	18
Figure 8: Strong and Weak Utilization by Industry Sectors.....	19
Figure 9: Summary of Utilization Levels by Industry Sector	19
Figure 10: Gaps and Opportunities for Increasing Utilization by Industry Sector	20
Figure 11: Barriers to Adopting Internet Applications and Processes	20
Figure 12: Job Creation and Internet Use in Commercial Enterprises.....	21
Figure 13: Utilization by Households: DEi Score and Regional Ranking.....	21
Figure 14: Impact of Age and Income on Internet Utilization	22
Figure 15: Computer Skill Levels.....	22
Figure 16: Internet utilization Levels by Age and Income	22

Figure 17: Percentage of Households Using the Internet for Productivity 23

This report is one of several deliverables that are part of the Kentucky Broadband Project of the Commonwealth Office of Broadband Outreach and Development (OBOD), and managed by Michael Baker Jr., Inc. (Baker). Ongoing project reporting, outreach, field work, surveys, data analysis and development and map production incorporate information relating to the Commonwealth's Broadband availability, utilization and adoption in specific regions, including characteristics such as service provider data and coverage areas, industry and business data, and household demographics. The project derives from the American Recovery and Reinvestment Act (ARRA) of 2009; funded from the State Broadband Initiative (SBI), and administered by the National Telecommunications and Information Association (NTIA) for a five-year period .

For certain project components, Baker contracted with Strategic Networks Group (SNG) to administer user surveys, and to tabulate, analyze and develop reports based on the collected survey data. The Project Area Profile on the following pages was prepared by Strategic Networks Group under in partnership with Michael Baker Jr. Inc.

This report is the second of two companion documents:

- 1) The Kentucky e-Strategy Report provides a state-wide analysis of utilization of the Internet. This state-wide perspective highlights trends that impact all regions to some degree. The report includes a comparative analysis of the Internet across the five regions of Kentucky: East, Central, West, North and Northeast. (See appendix for list of counties within each of the five regions).
- 2) The second set of documents consists of profiles for areas undertaking broadband planning initiatives in collaboration with the Kentucky Office of Broadband Outreach and Development (OBOD) and the Kentucky Council of Area Development Districts (KCADD). Recommendations from the Kentucky e-Strategy Report are reproduced in section 2 of each area profile, thereby providing a state-wide framework for local and regional broadband planning.

In addition to the documents noted above, the Office of Broadband Outreach and Development and the Kentucky Association of Area Development Districts can access online platforms that include databases on Internet use and impacts, as well as the underlying broadband infrastructure. These online platforms can provide customized reports on specific issues for defined geographic areas or sectors.

The area profiles focus on the specific opportunities and gaps for five geographic areas: Central Kentucky (Lincoln Trail, Lake Cumberland and Barren River Area Development Districts), East Kentucky (Big Sandy, Cumberland Valley and Kentucky River Area Development Districts), Northeast Kentucky (Buffalo Trace, Gateway and FIVCO Area Development Districts), Purchase Area Development District, and **North (KIPDA and Northern Kentucky, excluding Jefferson County)**.

In each of the geographic areas that are profiled, a broadband planning initiative is being undertaken on an issue specific to that region. In the North Region, that issue is improving

broadband infrastructure along the 1-71 corridor to world-class standards. Section 4.3 of this profile provides data and analysis specifically current connectivity within the North region. The other parts of this report include:

- **Sections 1 & 2: Background and Recommendations.** These two sections provide a state-wide perspective of issues related to broadband adoption and utilization. Section 2 includes Kentucky wide recommendations that provide a framework for local and regional broadband planning and efforts.
- **Section 3: Starting Points.** This section introduces basic concepts required for comparative analysis of broadband use in regions and sectors across Kentucky.
- **Section 4: Project Area Profile.** This section includes data and analysis specific to the project area – in this case the North Region.

Those interested in a detailed exploration of regional performance in broadband utilization are encouraged to contact the OBOD and KCADD.

1. Background, Summary and Recommendations

Many communities and regions across Kentucky face significant challenges, among them economic dislocation and an aging population. Most rural areas face the additional challenge of population shifts from rural to urban areas. In the face of these challenges, how can communities and businesses maximize their competitiveness, while improving their quality of life?

One area with significant potential is broadband (essentially high-speed Internet access), which can be leveraged into tangible benefits for communities, businesses and households. Businesses can become more productive, competitive and reach into new markets. Households can access services more easily and often more cheaply. Governments can delivery services more cost effectively.

The first step in benefiting from broadband is acquiring connectivity or access to the Internet. Once access is acquired, the second step is adoption, whereby households, businesses and other organizations begin to use their high-speed Internet access on a regular basis.

The third stage in broadband development is utilization of the Internet in increasingly productive ways that bring concrete benefits, such as jobs, new savings and revenues, and improved quality of life. This report focuses on utilization as the third stage of broadband development.

The benchmarking of Internet utilization in Kentucky is based on data collected in February and March 2012. This report represents an analysis of this data from a regional perspective and is intended to support regional broadband planning.

Utilizing Broadband

The ability to utilize or leverage broadband varies significantly across businesses, organizations and households. Not all businesses or households have been able to turn the potential of broadband into measurable success in terms of jobs, company attraction and retention, increased tax base and revenues, and more efficient and effective citizen services. Turning potential into reality requires skills, training, and both formal and informal support, all in addition to access to broadband availability.

In those industry sectors and communities that already have a large, diverse and modern economy and work force, building broadband infrastructure may be sufficient to realize the potential of broadband. However, many industry sectors, communities, businesses and households have limited Internet related skills and capacity. For these groups, even with state-of-the-art connectivity, leveraging broadband often lags. The consequence is that these communities (and households and businesses) lose out on many of the benefit of broadband. More importantly, over time, these communities are at risk of becoming economically uncompetitive and generally less attractive to households and businesses.

This report examines how organizations and households in North Kentucky differ in their utilization of broadband and where they can look to make improvements. The report shows in detail how industry sectors and household types in North Kentucky compare to each other and to statewide patterns. The report provides insights and hard evidence that allow communities, businesses, and households to assess where they stand and to identify what kinds of actions will improve their performance and benefits.

The report includes statewide recommendations for how the Commonwealth of Kentucky and its regions can improve the utilization of broadband, thereby improving their economies and quality of life. Recommendations are broken down into three areas: gaps and opportunities where regions are lagging in their use of the Internet and broadband; key barriers to improving the use and benefits of Internet and broadband; and the best ways to build skills and abilities. Analysis and recommendations are identified for both organizations (commercial and non-commercial) and households. For the purposes of this report, regional analysis has been organized into five distinct regions of Kentucky: North, Northeast, East, West, and Central. The composition of these five regions is outlined in Appendix 1.

*This report uses data collected in February through April 2012 across Kentucky. A total of 2,231 organizations and 4,122 households contributed to the state-wide broadband benchmarking effort. The sample for North Kentucky is 483 organizations and 695 households.**

* A summary of the findings from the 2012 benchmarking effort can be found in the *Broadband KY e-Solutions Benchmarking Technical Report* (May 2012). The number of responses collected in this analysis is substantial, especially when compared to national polls.

2. State-wide Recommendations

To assist stakeholders and communities to better understand and use this report, the recommendations of the Kentucky e-Strategy Report were structured around fundamental questions that leaders and decision-makers face in terms of leveraging broadband for the socio-economic benefit of their communities and constituents.

1. How important is high-speed Internet access to Kentucky, its communities and its residents?

In the twenty-first century, high-speed Internet access has been 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 high-speed Internet access speaks directly to a community's viability, competitiveness and quality of life. However, each region and community has its own unique characteristics, assets and challenges. Current Internet usage and opportunities for development vary widely, as explored in detail in the various sections of this report. Each region requires strategies and initiatives that address its unique situation. The Commonwealth can provide support, but social and economic developments are essentially local and regional in nature.

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.

Benchmarking Data for Kentucky, May 2012.

Recommendation #1: *Each region or groups of communities must develop its own strategy and initiatives based on its own characteristics, values and priorities.*

2. Where are the major gaps or weaknesses in utilization of the Internet?

Prioritizing industry sectors and other economic groups must be done within a regional context. Additional factors and considerations exist within each region, such as key industry sectors in decline or regional strategies for developing specific sectors. In general, focus should be on industry sectors that make the largest contribution to the economy and that have the greatest growth potential.

Key gaps in Internet utilization are focused on household income, age, and skill level, degree of "rurality", and organizational size and industry sector.

Recommendation #2: *Focus on high opportunity industry sectors within each region rather than undertaking broad but untargeted initiatives.*

3. How do we use the potential of the Internet to maximize job creation?

Small to medium sized organizations should be a focus for all regions. This segment is important for the following reasons:

- Includes 95% of all establishments and 43% of all employment in Kentucky
- Has the lowest or weakest utilization levels compared to organizations with larger numbers of employees
- Is a dynamic engine for employment growth, especially through use of the Internet
- Has the least capacity and expertise to adopt more sophisticated and productive Internet applications

Recommendation #3: *Focus on the small-medium enterprise segment, especially 1-49 employees, to increase Internet utilization, thereby driving competitiveness, revenues and job creation.*

4. In what areas do small to medium sized business need help?

Broadband KY e-Solutions Benchmarking (eSB) identifies which types of Internet enabled applications and processes are relatively easy or hard to adopt, especially by small to medium sized organizations. Using data on barriers to adoption, action plans can be defined at the regional level to address target groups. Note: e-solutions is the term used in this report 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.

Recommendation #4: *Initiatives aimed at increasing utilization among the small to medium enterprise segment should focus on the following 10 utilization categories:*

1. *Delivery of services and content*
2. *Rich media or service creation¹*
3. *Teleworking*
4. *Staff training and skills development*
5. *Advertising and promotion*
6. *Social networking*
7. *Government transactions*
8. *Customer service and support*
9. *Selling goods or services*
10. *Supplier communication and coordination*

¹ Rich media describes Web pages that use advanced technology such as streaming video, downloaded programs that interact instantly with the user for advertising.

5. How can we reach households that have not adopted the Internet or use it only minimally?

Many households that use the Internet still do not use the Internet very productively. Low utilization households are very similar to non-adopting households. They are disproportionately older and lower income. Households with low Internet adoption represent an important group due to the social and economic benefits that can be accessed through the Internet. As governments and businesses move their services to the Internet to achieve better reach and cost efficiencies, it is increasingly important that citizens have the ability to access and benefit from these online services. However, a large portion of lower income and older households have difficulty adopting and using the Internet. Given that low adoption and utilization is strongly tied to age and income, training should be targeted at people over 64 and households with lower incomes.

The poorer one is and the older one is, the less likely one uses the Internet and the less productively one uses it.

Recommendation #5: *Develop training programs and resources that target households over the age of 64 or have below average incomes.*

6. Is it true that the rural areas have a particularly hard time in adopting and using the Internet?

Yes! While both urban and rural households struggle to use and benefit from the Internet, information in Sections 4.2 reveal that rural households are relatively disadvantaged, with households being generally older and having lower average incomes. Table 27 shows non-metropolitan areas with significantly lower utilization levels compared to metropolitan areas. Consequently, non-metropolitan households tend to have greater difficulty in accessing educational, health and government services, all of which are increasingly available online.

Recommendation #6: *Non-metropolitan areas are a priority for Internet training programs and resources. Rather than trying to entice target populations into existing programs (such as classroom courses), Internet training initiatives should reflect the preference for both self-directed online resources, as well as existing informal networks that already have participation by these target groups. These can include seniors' centers, libraries, churches and community centers.*

7. How can we help citizens of Kentucky make better use of the Internet?

Rather than trying to entice target populations into existing programs (such as classroom courses), e-solution adoption initiatives should reflect the preference for both self-directed online resources, as well as

existing informal networks that already have participation by these target groups. These can include senior centers, libraries, churches and community centers.

Recommendation #7: In designing initiatives to increase and improve Internet utilization by households and organizations, considerable weight should be given to those learning methods that are preferred by the target populations.

The preferred learning methods of 47% of those over 65 in Kentucky are “talking to others” and “online information”. The least preferred learning methods were “workshops” and “classrooms courses” (preferred by 16%).

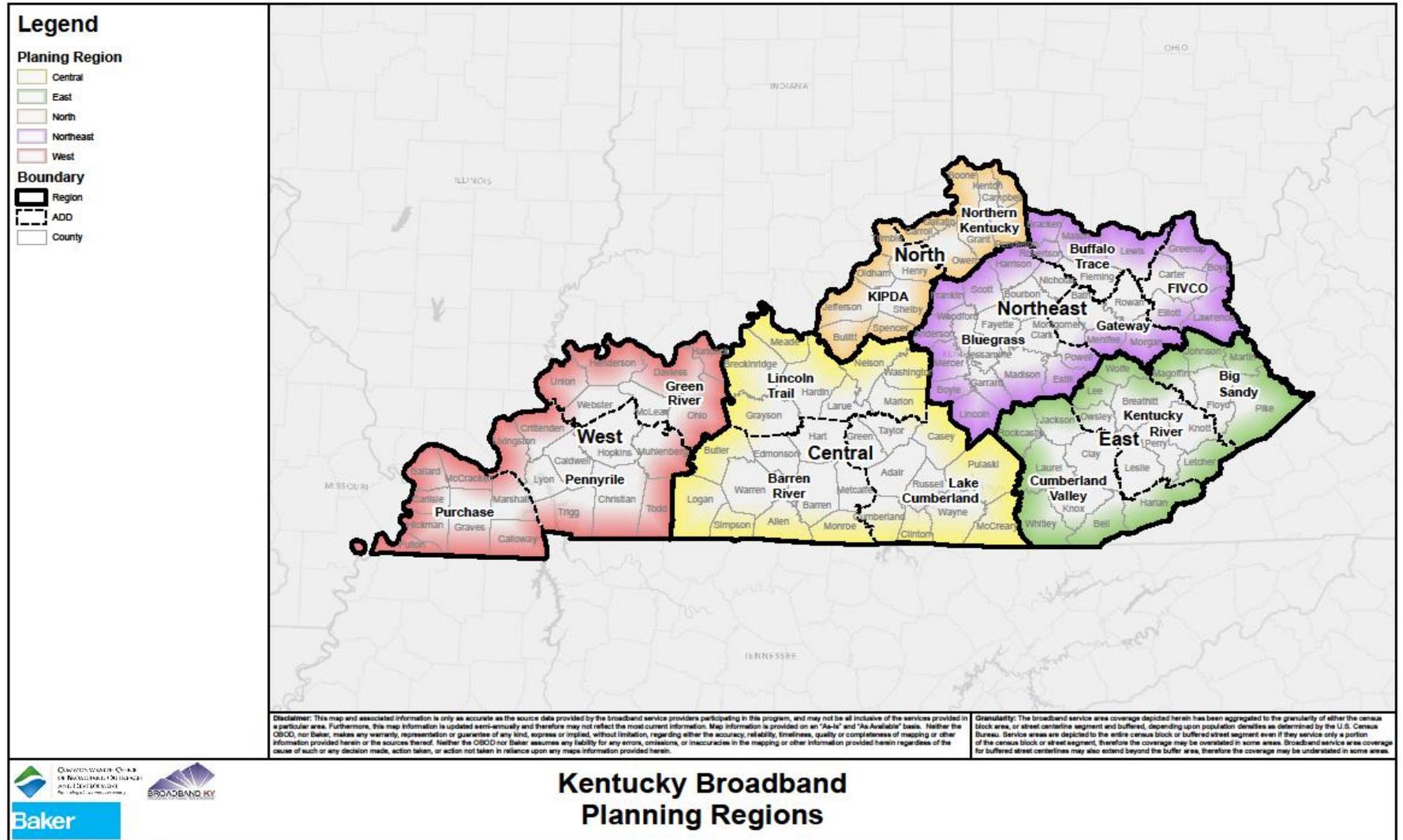
8. How can those who do not use the Internet be assisted to start using the Internet in ways that produce tangible benefits?

Approximately one in five individuals in Kentucky does not use or benefit from the Internet. The largest group of non-Internet users are those 65 years and older. However, lower income households also have significantly lower rates of Internet adoption.

Barriers to Internet adoption vary significantly by type of household. Almost half of non-adopting older households see little value in the Internet, while generally being less skilled in use of computers and Internet. Working age individuals tend to have better computer and Internet skills, but find having Internet at home too expensive. These working age ‘non-adopters’ are more likely to have children at home and have at least one other person in the household who uses the Internet. These working age households are less likely to be completely isolated from the Internet.

Recommendation #8: *Broadband adoption programs should focus on those key groups that face persistent barriers to adoption, specifically elderly households and lower income households where no-one else in the household uses the Internet. Internet adoption programs should be design to address specific barriers facing their targeted group.*

Figure 1: Kentucky Regions



3. Starting Points

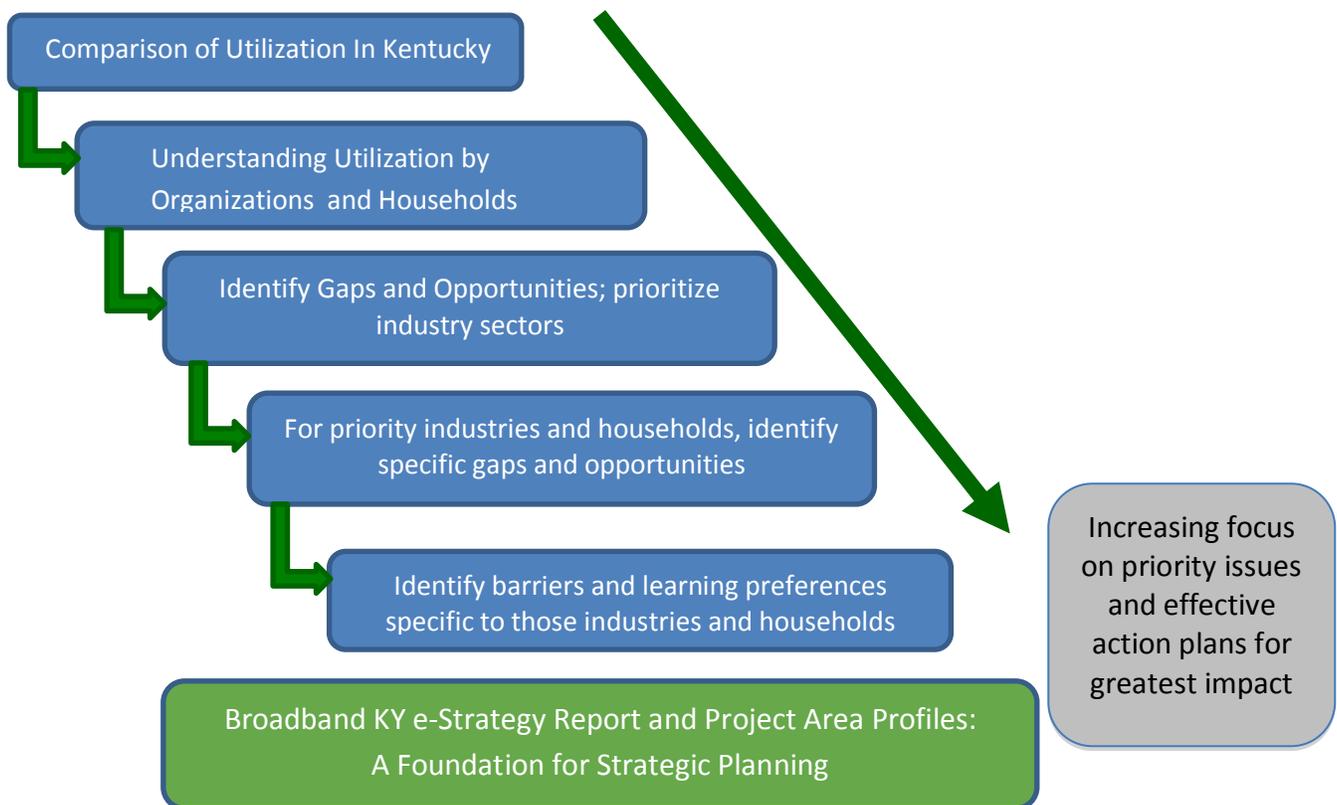
3.1 Organization and Objectives of the Report

This report is designed to be a catalyst for leveraging broadband through actionable intelligence. The chart below outlines steps used in this report to move from descriptive data to detailed analysis of targets, priorities and strategies. The ultimate goal of the analysis of broadband in Kentucky is to:

1. Identify which segments of the regional economy utilize the Internet to a greater or lesser degree;
2. Prioritize the segments that show utilization gaps based on importance to the regional economy and opportunity to address the gaps; and,
3. Identify specific uses of the Internet that should be addressed to close the gaps, resulting in effective actions that are targeted where they will have the most impact.
4. Identify the barriers to improved Internet utilization, as well as the best means to overcome them.

For those interested in a more detailed exploration of regional performance in broadband utilization, you are strongly encouraged to contact regional outreach staff from the Kentucky Office for Broadband Outreach and Development.

Leveraging Broadband for Economic and Social Development



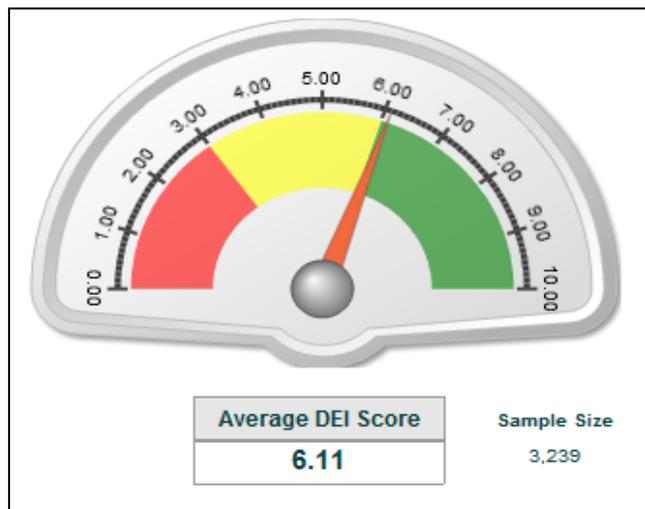
3.2 The Digital Economy index (DEi)

This report includes comparisons of Internet use between regions by various characteristics, such as industry, business size, and household demographics. To assist in the process of making comparisons, a mechanism was developed for establishing benchmarks. Benchmarks are useful in creating reference points against which the performance of any individual or group can be compared. Strategic Networks Group has developed a benchmarking process based on its Digital Economy index (DEi).

The Digital Economy index (DEi) reflects an organization’s or household’s utilization of a range of Internet applications and process – 17 for organizations and 30 for households. These applications and processes (e-solutions) are listed on the following pages. 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. A separate DEi is used to compare how different types of households use the Internet.

An organization’s or household’s DEi score (from 0 to 10) captures that their utilization of e-solutions, with 10 being the highest possible use. DEi scores are averaged across groups of users by various categories: e.g. a sector’s DEi is the average for all organizations in that sector. The DEi is used as a basis for comparison of utilization levels across various dimensions.

Identifying variations in DEi assists in focusing on areas where a deeper assessment is warranted. In areas where DEi is lower than average, indicating lower utilization, there is an opportunity to increase utilization and benefits to organizations and households.



DEi Meter from dashboard of the Digital Economy Analytics Platform.

The Color Coding for DEi Scores: To better show how industry sectors perform, the DEi tables in this report are color coded from the highest (**green**) to lowest (**red**) to highlight how DEi scores compare. **The color coding (green to red)** allows one to quickly compare groups based on how utilization varies.

Highest
2
3
4
5
6
Lowest
Insufficient Data

Different DEi comparisons can be useful for different purposes, for example:

- Individual organizations can compare their DEi score with a benchmark average DEi score for their industry in their region. This can provide insights into how well an organization is performing in terms of Internet use compared to their peers.

- Broadband planners and economic development agencies can compare DEi benchmarks between different organization characteristics, such as industries and business sizes, to gain insights into relative utilization levels to aid in targeting low utilization groups. They can also compare DEi benchmarks on a regional basis to aid in planning.
- Providers of broadband services and infrastructure can use DEi benchmarks to gain insights into where high utilization levels exist and where low utilization level need to be addressed in order to promote the greatest use from their broadband investments.

e-Solutions refer 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-Solutions Categories for Households	
<i>Communication</i>	<i>Transactions</i>
E-mail	Buying goods or services
Voice over IP	Selling items
Online chat	Investments / trading
Sharing information	Online banking
Personal website	Paying bills
<i>Productivity</i>	Government services
Education or training courses	Music or video download
Accessing workplace	Software download
Teleworking	Booking travel
Home business	<i>Research</i>
<i>Recreation</i>	Product information
News and sports	Investments
Listen to radio	Government information
Watch TV programs	Community events
Watch movies	Education and training
Online gaming	Health information
	Travel information

e-Solutions Categories for Organizations	
<i>e-Commerce Related</i>	<i>e-Process Related</i>
Selling goods or services	Purchasing goods or services
Deliver services and content	Supplier communication and coordination
Rich media or service creation	Electronic document transfer
Customer service and support	Staff training and skills development
Advertising and promotion	Teleworking
Social networking	Accessing collaborative tools
Web site for organization	Banking and financial
Research by staff	Government transactions
	Access government information

4. 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 2: 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		

The North Region has significantly higher than average (median) income and an age profile similar to the State, and 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 3: 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 4: Age Profile of North Kentucky (including Jefferson)

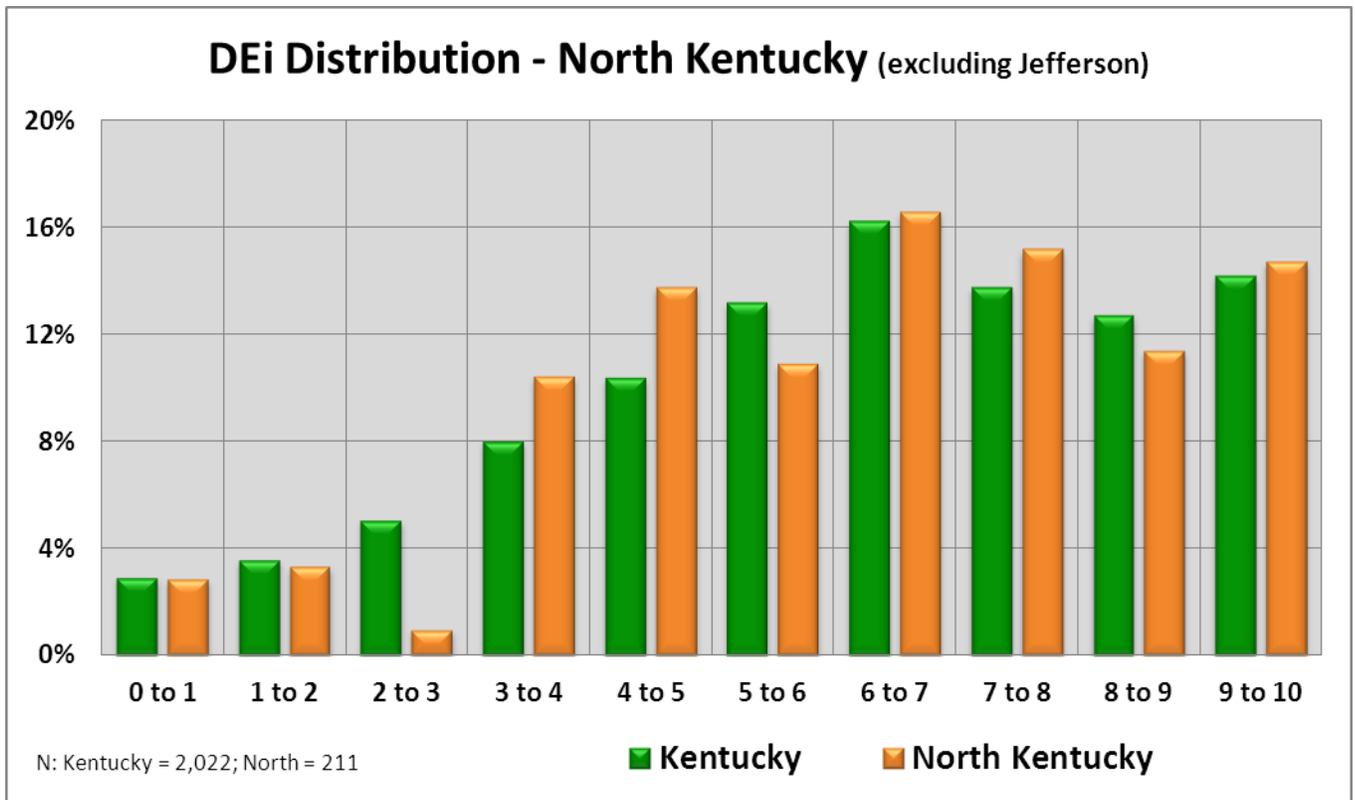
Age Distribution of Adults	North	Statewide
18 to 34 years	22.4%	22.6%
35 to 49 years	21.3%	20.7%
50 to 64 years	19.7%	19.8%
65 years and over	12.3%	13.3%

4.1 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 5: 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 can be seen in the following table:

Figure 6: 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 7: 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 8: 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 9: 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

4.1.1 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 10: 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 areas with significantly higher growth expectations.*

4.1.2 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 11: 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%
---------------------------------------	-------	-------

4.1.3 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 12: 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

4.2 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 13: 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

4.2.1 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 14: Impact of Age and Income on Internet Utilization (excluding Jefferson)

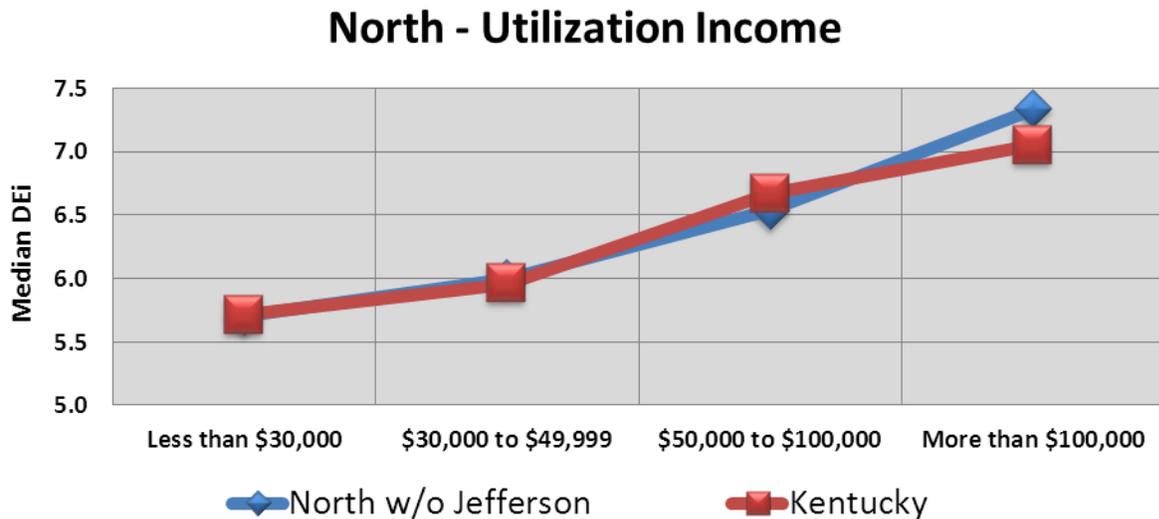
North Kentucky	Household Income			
Respondent Age	Less than \$30,000	\$30,000 to \$49,999	\$50,000 to \$100,000	More than \$100,000
18 to 34	6.08	6.59	6.15	7.07
35 to 54	5.05	6.75	6.86	7.88
55 to 64	6.35	5.28	6.09	6.60
65 years and over	3.80	5.35	6.11	6.58

Figure 15: Computer Skill Levels (excluding Jefferson)

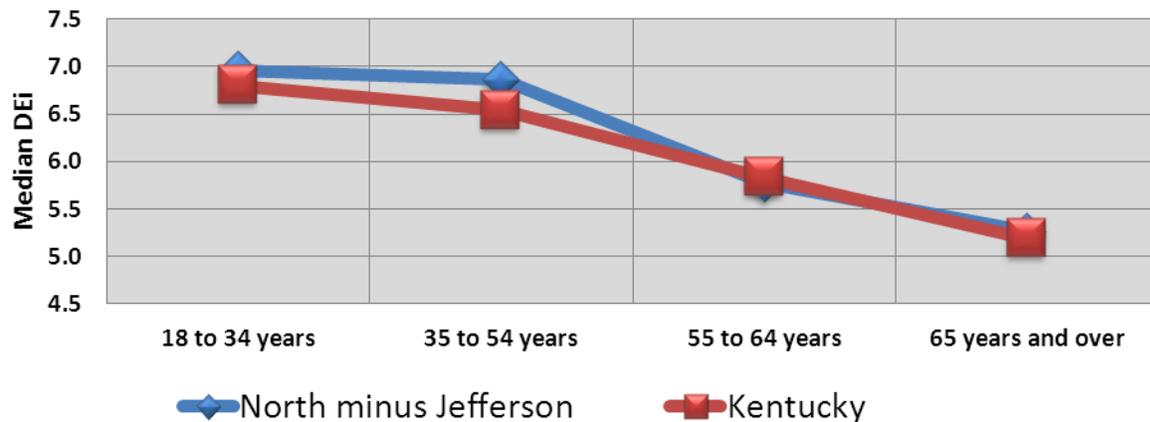
	Expert user	Use computers with confidence	Know the basics
North Kentucky	26.5%	59.6%	13.4%
Statewide	25.6%	59.9%	14.1%

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 16: North Internet Utilization Levels by Age and Income



North - Utilization by Age



4.2.2 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 17: 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%

4.3 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 additional information on current connectivity within the region. *NOTE:* Appendix 3-7 provide supplemental maps and information pertaining to the current-state of Broadband availability, technology and speed for Northern Kentucky, including a directory of Providers offering service.

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 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.

A regional focus on infrastructure will require an understanding of broadband demand and the community of Providers who presently supply service in Northern Kentucky.

Providers are a strategic group – Within the corridor and throughout the region, Providers will be maintaining and expanding their networks based on established business interests. Planning efforts centered on developing a Provider-specific group of interest will enable:

- Regular and ongoing engagement with Providers to build trust and create an environment where active collaboration will occur
- The sharing of information, to begin to strategize on regional efforts and the greater OBOD goals for the Commonwealth
- Listening and understanding the Provider business model -- business, technology and network issues they face when making decisions for their organizations,
- Fostering and facilitating an active and open dialog

Through regular interaction, Providers will develop more of a connection with the community, and begin to see regional Broadband needs based on mutual interests. Developing a positive and business-friendly engagement strategy can build strong Providers allies for the project and establish longer-term sustainable partnerships for the region in the years ahead.

Because they are “experts” on building and delivering technology-based services to customers in their service area, Provider engagement should center on regional Broadband needs and how this group can leverage technology to meet the demand of the region.

Appendix 1: Breakdown of Regions by County

<i>North</i>	<i>County</i>	<i>Population</i>	<i>Median Income</i>	<i>% in Poverty</i>	<i>Incidence of 65+</i>
KIPDA	Bullitt	74,319	\$48,344	10.7%	11.2%
	Henry	15,416	\$42,733	16.8%	14.2%
	Oldham	60,316	\$79,353	5.9%	9.2%
	Shelby	42,074	\$51,439	12.4%	12.0%
	Spencer	17,061	\$63,218	9.6%	10.2%
	Trimble	8,809	\$45,767	15.7%	12.9%
		217,995	\$58,184	10.2%	11.0%
Northern Kentucky	Boone	118,811	\$67,994	7.9%	9.5%
	Campbell	90,336	\$50,033	11.1%	12.8%
	Carroll	10,811	\$43,862	17.3%	12.9%
	Gallatin	8,589	\$40,603	19.3%	11.4%
	Grant	24,662	\$42,814	16.7%	10.7%
	Kenton	159,720	\$50,957	13.2%	11.2%
	Owen	10,841	\$38,605	17.7%	14.5%
	Pendleton	14,877	\$44,195	15.4%	12.3%
		438,647	\$54,011	11.9%	11.2%

Appendix 2: 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.

Appendix 3: Broadband Speeds in Select Kentucky Counties

< See attached .PDF map >

Appendix 4: Broadband Services in Select Kentucky Counties

< See attached .PDF map >

Appendix 5: Broadband Services in Select Kentucky Counties (Mobile)

< See attached .PDF map >

Appendix 6: Broadband Service - Outside of Focus Area (Shown in green)

< See attached .PDF map >

Appendix 7: Providers of Broadband Service - Within Focus Area

< See attached .xls spreadsheet >

For more information about the contents in this document, please contact Project Management:

William Bates, Michael Baker Jr., Inc. -- 717.221.2065

Robert Lois, Deputy Project Manager, Michael Baker Jr., Inc. -- 724-495-4045

Baker



strategic
networks group
the broadband economists

Broadband KY

Northeast Kentucky Profile

Utilizations and Impacts of Broadband
for Businesses, Organizations and Households



This report was prepared by Strategic Networks Group in
partnership with Michael Baker Jr., Inc.

Baker



September 21st, 2012

Prepared for:

*Commonwealth of Kentucky Office of Broadband
Outreach and Development*



COMMONWEALTH OFFICE
OF BROADBAND OUTREACH
AND DEVELOPMENT
Promoting a 21st century economy



TABLE OF CONTENTS

1. Background, Summary and Recommendations	5
2. State-wide Recommendations	7
3. Starting Points	12
3.1 Organization and Objectives of the Report	12
3.2 Introducing the Digital Economy index (DEi).....	13
4. Project Area Profile: Northeast Kentucky	16
4.1 Utilization by Organizations in Northeast Kentucky	17
4.1.1 Opportunities and Gaps Based on Utilization	19
4.1.2 Barriers to Utilization.....	20
4.1.3 Impacts from Increasing Utilization.....	20
4.2 Households in Northeast Kentucky	21
4.2.1 Demographic Effects on Utilization	21
4.2.2 Use of Internet for Productivity.....	22
4.3 Focus on Project Area Priorities	23
Appendix 1: Breakdown of Regions by County	26
Appendix 2: Glossary.....	27
Figure 1: Kentucky Regions.....	11
Figure 2: Demographic and Economic Profile	16
Figure 3: Largest Economic Sectors in Northeast Kentucky (excluding Bluegrass)	16
Figure 4: Age Profile of Northeast Kentucky (excluding Bluegrass)	17
Figure 5: Range of Internet Utilization by DEi	17
Figure 6: Internet Utilization by Employment Size: Northeast Kentucky.....	18
Figure 7: Share of Labor Force by Size of Organizations	18
Figure 8: Strong and Weak Utilization by Industry Sectors	18
Figure 9: Summary of Utilization (average DEi) Levels by Industry Sector (including Bluegrass)	19
Figure 10: Gaps and Opportunities for Increasing Utilization by Industry Sector.....	19
Figure 11: Barriers to Adopting Internet Applications and Processes (excluding Bluegrass).....	20
Figure 12: Job Creation and Internet Use in Commercial Enterprises (including Bluegrass)	20
Figure 13: Utilization by Households: DEi Score and Regional Ranking	21
Figure 14: Impact of Age and Income on Internet Utilization (excluding Bluegrass)	21
Figure 15: Computer Skill Levels (excluding Bluegrass).....	21
Figure 16: Northeast Internet Utilization Levels by Age and Income (excluding Bluegrass).....	22
Figure 17: Percentage of Households Using the Internet for Productivity (excluding Bluegrass)	22
Figure 18: Percent of Commercial Organizations Using Specific Applications and Processes	23

Figure 19: Preferred Learning Methods 24
Figure 20: Percent of Businesses that Currently Use Cloud Solutions 24

This report is one of several deliverables that are part of the Kentucky Broadband Project of the Commonwealth Office of Broadband Outreach and Development (OBOD), and managed by Michael Baker Jr., Inc. (Baker). Ongoing project reporting, outreach, field work, surveys, data analysis and development and map production incorporate information relating to the Commonwealth's Broadband availability, utilization and adoption in specific regions, including characteristics such as service provider data and coverage areas, industry and business data, and household demographics. The project derives from the American Recovery and Reinvestment Act (ARRA) of 2009; funded from the State Broadband Initiative (SBI), and administered by the National Telecommunications and Information Association (NTIA) for a five-year period from 01/01/2010 to 12/31/2014.

For certain project components, Baker contracted with Strategic Networks Group (SNG) to administer user surveys, and to tabulate, analyze and develop reports based on the collected survey data. The Project Area Profile on the following pages was prepared by Strategic Networks Group under contract and in partnership with Michael Baker Jr. Inc.

This report is the second of two companion documents:

- 1) The Kentucky e-Strategy Report provides a state-wide analysis of utilization of the Internet. This state-wide perspective highlights trends that impact all regions to some degree. The report includes a comparative analysis of the Internet across the five regions of Kentucky: East, Central, West, North and Northeast. (See appendix for list of counties within each of the five regions).
- 2) The second set of documents consists of profiles for areas undertaking broadband planning initiatives in collaboration with the Kentucky Office of Broadband Outreach and Development (OBOD) and the Kentucky Council of Area Development Districts (KCADD). Recommendations from the Kentucky e-Strategy Report are reproduced in section 2 of each area profile, thereby providing a state-wide framework for local and regional broadband planning.

In addition to the documents noted above, the Office of Broadband Outreach and Development and the Kentucky Association of Area Development Districts can access online platforms that include databases on Internet use and impacts, as well as the underlying broadband infrastructure. These online platforms can provide customized reports on specific issues for defined geographic areas or sectors.

The area profiles focus on the specific opportunities and gaps for five geographic areas: Central Kentucky (Lincoln Trail, Lake Cumberland and Barren River Area Development Districts), East Kentucky (Big Sandy, Cumberland Valley and Kentucky River Area Development Districts), **Northeast Kentucky (Buffalo Trace, Gateway and FIVCO Area Development Districts)**, Purchase Area Development District, and North (KIPDA and Northern Kentucky, excluding Jefferson County).

In each of the geographic areas that are profiled, a broadband planning initiative is being undertaken on an issue specific to that region. In the Northeast Region, that issue is increased awareness of the benefits of

Broadband for economic development and increased meaningful utilization among small/medium enterprises. Section 4.3 of this profile provides data and analysis specifically on this issue within the Northeast Region. The other parts of this report include:

- **Sections 1 & 2: Background and Recommendations.** These two sections provide a state-wide perspective of issues related to broadband adoption and utilization. Section 2 includes Kentucky wide recommendations that provide a framework for local and regional broadband planning and efforts.
- **Section 3: Starting Points.** This section introduces basic concepts required for comparative analysis of broadband use in regions and sectors across Kentucky.
- **Section 4: Project Area Profile.** This section includes data and analysis specific to the project area – in this case the Northeast Region.

Those interested in a more detailed exploration of regional performance in broadband utilization are strongly encouraged to contact staff from OBOD and KCADD.

1. Background, Summary and Recommendations

Many communities and regions across Kentucky face significant challenges, among them economic dislocation and an aging population. Most rural areas face the additional challenge of population shifts from rural to urban areas. In the face of these challenges, how can communities and businesses maximize their competitiveness, while improving their quality of life?

One area with significant potential is broadband (essentially high-speed Internet access), which can be leveraged into tangible benefits for communities, businesses and households. Businesses can become more productive, competitive and reach into new markets. Households can access services more easily and often more cheaply. Governments can delivery services more cost effectively.

The first step in benefiting from broadband is acquiring connectivity or access to the Internet. Once access is acquired, the second step is adoption, whereby households, businesses and other organizations begin to use their high-speed Internet access on a regular basis.

The third stage in broadband development is utilization of the Internet in increasingly productive ways that bring concrete benefits, such as jobs, new savings and revenues, and improved quality of life. This report focuses on utilization as the third stage of broadband development.

The benchmarking of Internet utilization in Kentucky is based on data collected in February and March 2012. This report represents an analysis of this data from a regional perspective and is intended to support regional broadband planning.

Utilizing Broadband

The ability to utilize or leverage broadband varies significantly across businesses, organizations and households. Not all businesses or households have been able to turn the potential of broadband into measurable success in terms of jobs, company attraction and retention, increased tax base and revenues, and more efficient and effective citizen services. Turning potential into reality requires skills, training, and both formal and informal support, all in addition to access to broadband availability.

In those industry sectors and communities that already have a large, diverse and modern economy and work force, building broadband infrastructure may be sufficient to realize the potential of broadband. However, many industry sectors, communities, businesses and households have limited Internet related skills and capacity. For these groups, even with state-of-the-art connectivity, leveraging broadband often lags. The consequence is that these communities (and households and businesses) lose out on many of the benefit of broadband. More importantly, over time, these communities are at risk of becoming economically uncompetitive and generally less attractive to households and businesses.

This report examines how organizations and households in Northeast Kentucky (**Buffalo Trace, Gateway and FIVCO Area Development Districts**) differ in their utilization of broadband and where they can look to make improvements. The report shows in detail how industry sectors and household types in Northeast Kentucky compare to each other and to statewide patterns. The report provides insights and hard evidence that allow communities, businesses, and households to assess where they stand and to identify what kinds of actions will improve their performance and benefits. Note: data and analysis in this profile do not include the Bluegrass Area Development District, unless explicitly stated.

The report includes statewide recommendations for how the Commonwealth of Kentucky and its regions can improve the utilization of broadband, thereby improving their economies and quality of life. Recommendations are broken down into three areas: gaps and opportunities where regions are lagging in their use of the Internet and broadband; key barriers to improving the use and benefits of Internet and broadband; and the best ways to build skills and abilities. Analysis and recommendations are identified for both organizations (commercial and non-commercial) and households. For the purposes of this report, regional analysis has been organized into five distinct regions of Kentucky: North, Northeast, East, West, and Central. The composition of these five regions is outlined in Appendix 1.

*This report uses data collected in February through April 2012 across Kentucky. A total of 2,231 organizations and 4,122 households contributed to the state-wide broadband benchmarking effort. The sample for Northeast Kentucky is 171 organizations and 408 households.**

* A summary of the findings from the 2012 benchmarking effort can be found in the *Broadband KY e-Solutions Benchmarking Technical Report* (May 2012). The number of responses collected in this analysis is substantial, especially when compared to national polls.

2. State-wide Recommendations

To assist stakeholders and communities to better understand and use this report, the recommendations of the Kentucky e-Strategy Report were structured around fundamental questions that leaders and decision-makers face in terms of leveraging broadband for the socio-economic benefit of their communities and constituents.

1. How important is high-speed Internet access to Kentucky, its communities and its residents?

In the twenty-first century, high-speed Internet access has been 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 high-speed Internet access speaks directly to a community's viability, competitiveness and quality of life. However, each region and community has its own unique characteristics, assets and challenges. Current Internet usage and opportunities for development vary widely, as explored in detail in the various sections of this report. Each region requires strategies and initiatives that address its unique situation. The Commonwealth can provide support, but social and economic developments are essentially local and regional in nature.

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.

Benchmarking Data for Kentucky, May 2012.

Recommendation #1: *Each region or groups of communities must develop its own strategy and initiatives based on its own characteristics, values and priorities.*

2. Where are the major gaps or weaknesses in utilization of the Internet?

Prioritizing industry sectors and other economic groups must be done within a regional context. Additional factors and considerations exist within each region, such as key industry sectors in decline or regional strategies for developing specific sectors. In general, focus should be on industry sectors that make the largest contribution to the economy and that have the greatest growth potential.

Key gaps in Internet utilization are focused on household income, age, and skill level, degree of "rurality", and organizational size and industry sector.

Recommendation #2: *Focus on high opportunity industry sectors within each region rather than undertaking broad but untargeted initiatives.*

3. How do we use the potential of the Internet to maximize job creation?

Small to medium sized organizations should be a focus for all regions. This segment is important for the following reasons:

- Includes 95% of all establishments and 43% of all employment in Kentucky
- Has the lowest or weakest utilization levels compared to organizations with larger numbers of employees
- Is a dynamic engine for employment growth, especially through use of the Internet
- Has the least capacity and expertise to adopt more sophisticated and productive Internet applications

Recommendation #3: *Focus on the small-medium enterprise segment, especially 1-49 employees, to increase Internet utilization, thereby driving competitiveness, revenues and job creation.*

4. In what areas do small to medium sized business need help?

Broadband KY e-Solutions Benchmarking (eSB) identifies which types of Internet enabled applications and processes are relatively easy or hard to adopt, especially by small to medium sized organizations. Using data on barriers to adoption, action plans can be defined at the regional level to address target groups. Note: e-solutions is the term used in this report 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.

Recommendation #4: *Initiatives aimed at increasing utilization among the small to medium enterprise segment should focus on the following 10 utilization categories:*

1. *Delivery of services and content*
2. *Rich media or service creation¹*
3. *Teleworking*
4. *Staff training and skills development*
5. *Advertising and promotion*
6. *Social networking*
7. *Government transactions*
8. *Customer service and support*
9. *Selling goods or services*
10. *Supplier communication and coordination*

¹ Rich media describes Web pages that use advanced technology such as streaming video, downloaded programs that interact instantly with the user for advertising.

5. How can we reach households that have not adopted the Internet or use it only minimally?

Many households that use the Internet still do not use the Internet very productively. Low utilization households are very similar to non-adopting households. They are disproportionately older and lower income. Households with low Internet adoption represent an important group due to the social and economic benefits that can be accessed through the Internet. As governments and businesses move their services to the Internet to achieve better reach and cost efficiencies, it is increasingly important that citizens have the ability to access and benefit from these online services. However, a large portion of lower income and older households have difficulty adopting and using the Internet. Given that low adoption and utilization is strongly tied to age and income, training should be targeted at people over 64 and households with lower incomes.

The poorer one is and the older one is, the less likely one uses the Internet and the less productively one uses it.

Recommendation #5: *Develop training programs and resources that target households over the age of 64 or have below average incomes.*

6. Is it true that the rural areas have a particularly hard time in adopting and using the Internet?

Yes! While both urban and rural households struggle to use and benefit from the Internet, information in Sections 4.2 reveal that rural households are relatively disadvantaged, with households being generally older and having lower average incomes. Table 27 shows non-metropolitan areas with significantly lower utilization levels compared to metropolitan areas. Consequently, non-metropolitan households tend to have greater difficulty in accessing educational, health and government services, all of which are increasingly available online.

Recommendation #6: *Non-metropolitan areas are a priority for Internet training programs and resources. Rather than trying to entice target populations into existing programs (such as classroom courses), Internet training initiatives should reflect the preference for both self-directed online resources, as well as existing informal networks that already have participation by these target groups. These can include seniors' centers, libraries, churches and community centers.*

7. How can we help citizens of Kentucky make better use of the Internet?

Rather than trying to entice target populations into existing programs (such as classroom courses), e-solution adoption initiatives should reflect the preference for both self-directed online resources, as well as existing informal networks that already have participation by these target groups. These can include seniors' centers, libraries, churches and community centers.

Recommendation #7: In designing initiatives to increase and improve Internet utilization by households and organizations, considerable weight should be given to those learning methods that are preferred by the target populations.

The preferred learning methods of 47% of those over 65 in Kentucky are “talking to others” and “online information”. The least preferred learning methods were “workshops” and “classrooms courses” (preferred by 16%).

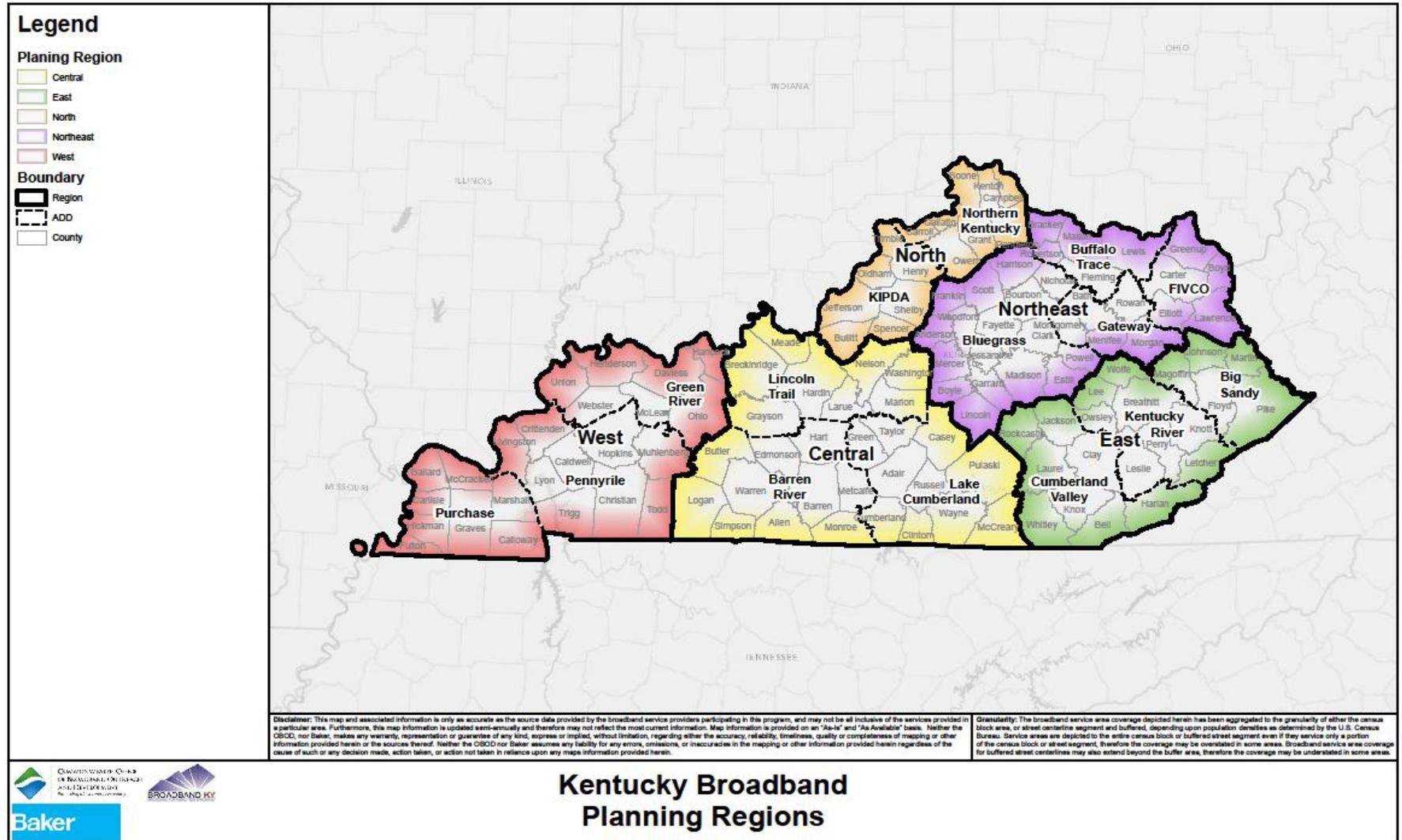
8. How can those who do not use the Internet be assisted to start using the Internet in ways that produce tangible benefits?

Approximately one in five individuals in Kentucky does not use or benefit from the Internet. The largest group of non-Internet users are those 65 years and older. However, lower income households also have significantly lower rates of Internet adoption.

Barriers to Internet adoption vary significantly by type of household. Almost half of non-adopting older households see little value in the Internet, while generally being less skilled in use of computers and Internet. Working age individuals tend to have better computer and Internet skills, but find having Internet at home too expensive. These working age ‘non-adopters’ are more likely to have children at home and have at least one other person in the household who uses the Internet. These working age households are less likely to be completely isolated from the Internet.

Recommendation #8: *Broadband adoption programs should focus on those key groups that face persistent barriers to adoption, specifically elderly households and lower income households where no-one else in the household uses the Internet. Internet adoption programs should be design to address specific barriers facing their targeted group.*

Figure 1: Kentucky Regions



3. Starting Points

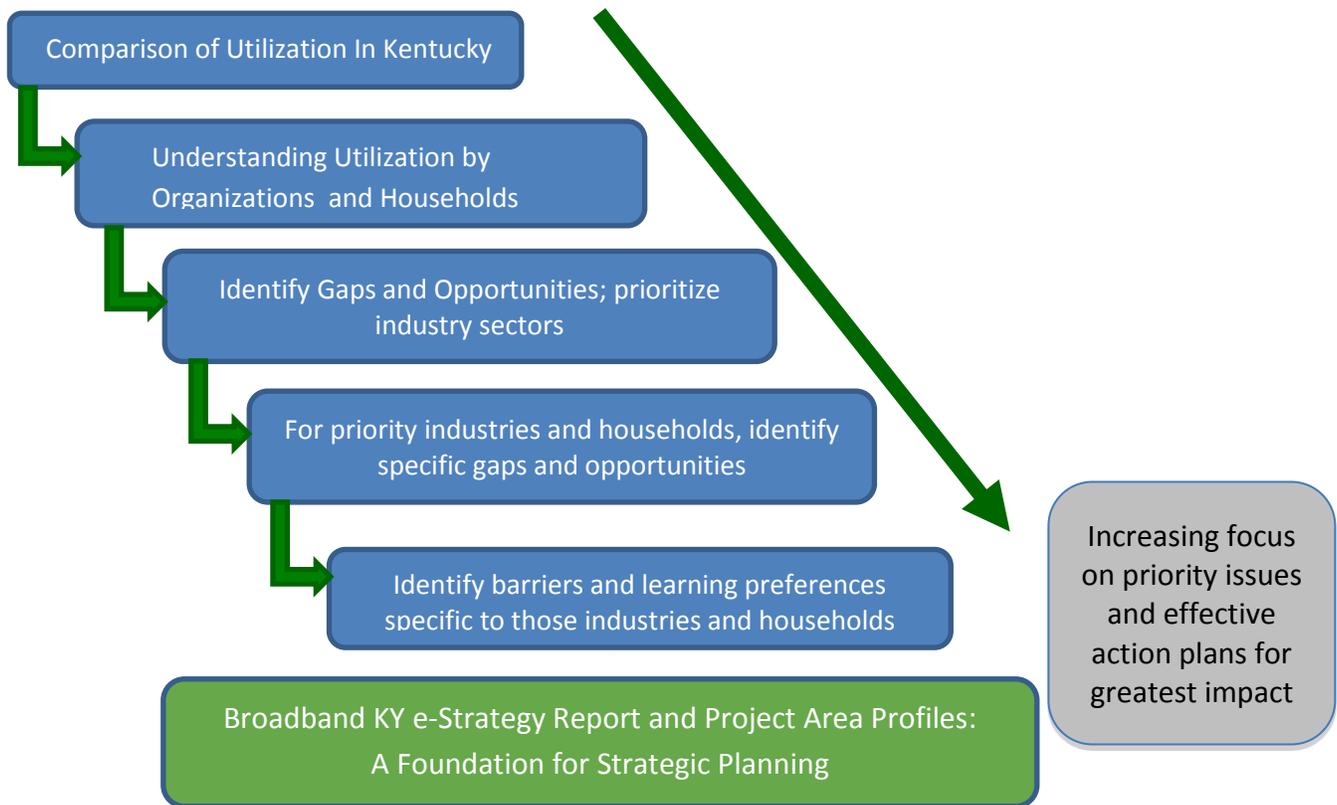
3.1 Organization and Objectives of the Report

This report is designed to be a catalyst for leveraging broadband through actionable intelligence. The chart below outlines steps used in this report to move from descriptive data to detailed analysis of targets, priorities and strategies. The ultimate goal of the analysis of broadband in Kentucky is to:

1. Identify which segments of the regional economy utilize the Internet to a greater or lesser degree;
2. Prioritize the segments that show utilization gaps based on importance to the regional economy and opportunity to address the gaps; and,
3. Identify specific uses of the Internet that should be addressed to close the gaps, resulting in effective actions that are targeted where they will have the most impact.
4. Identify the barriers to improved Internet utilization, as well as the best means to overcome them.

For those interested in a more detailed exploration of regional performance in broadband utilization, you are strongly encouraged to contact regional outreach staff from the Kentucky Office for Broadband Outreach and Development.

Leveraging Broadband for Economic and Social Development



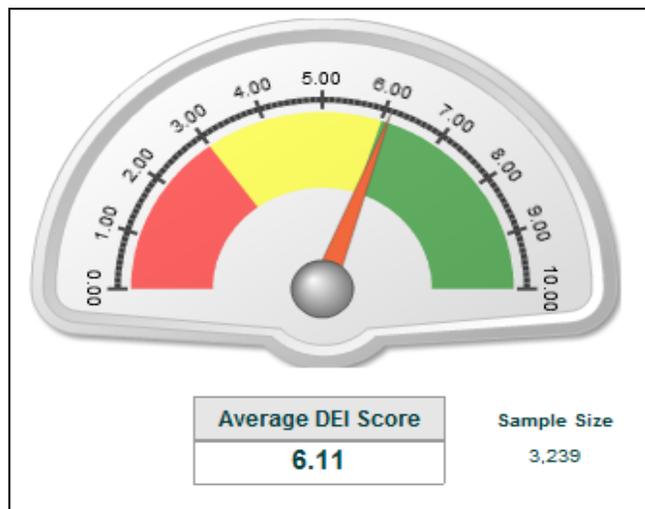
3.2 Introducing the Digital Economy index (DEi)

This report includes comparisons of Internet use between regions by various characteristics, such as industry, business size, and household demographics. To assist in the process of making comparisons, a mechanism was developed for establishing benchmarks. Benchmarks are useful in creating reference points against which the performance of any individual or group can be compared. Strategic Networks Group has developed a benchmarking process based on its Digital Economy index (DEi).

The Digital Economy index (DEi) reflects an organization’s or household’s utilization of a range of Internet applications and process – 17 for organizations and 30 for households. These applications and processes (e-solutions) are listed on the following pages. 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. A separate DEi is used to compare how different types of households use the Internet.

An organization’s or household’s DEi score (from 0 to 10) captures that their utilization of e-solutions, with 10 being the highest possible use. DEi scores are averaged across groups of users by various categories: e.g. a sector’s DEi is the average for all organizations in that sector. The DEi is used as a basis for comparison of utilization levels across various dimensions.

Identifying variations in DEi assists in focusing on areas where a deeper assessment is warranted. In areas where DEi is lower than average, indicating lower utilization, there is an opportunity to increase utilization and benefits to organizations and households.



DEi Meter from dashboard of the Digital Economy Analytics Platform.

The Color Coding for DEi Scores: To better show how industry sectors perform, the DEi tables in this report are color coded from the highest (**green**) to lowest (**red**) to highlight how DEi scores compare. **The color coding (green to red)** allows one to quickly compare groups based on how utilization varies.

Highest
2
3
4
5
6
Lowest
Insufficient Data

Different DEi comparisons can be useful for different purposes, for example:

- Individual organizations can compare their DEi score with a benchmark average DEi score for their industry in their region. This can provide insights into how well an organization is performing in terms of Internet use compared to their peers.

- Broadband planners and economic development agencies can compare DEi benchmarks between different organization characteristics, such as industries and business sizes, to gain insights into relative utilization levels to aid in targeting low utilization groups. They can also compare DEi benchmarks on a regional basis to aid in planning.
- Providers of broadband services and infrastructure can use DEi benchmarks to gain insights into where high utilization levels exist and where low utilization level need to be addressed in order to promote the greatest use from their broadband investments.

e-Solutions refer 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-Solutions Categories for Households	
Communication	Transactions
E-mail	Buying goods or services
Voice over IP	Selling items
Online chat	Investments / trading
Sharing information	Online banking
Personal website	Paying bills
Productivity	Government services
Education or training courses	Music or video download
Accessing workplace	Software download
Teleworking	Booking travel
Home business	Research
Recreation	Product information
News and sports	Investments
Listen to radio	Government information
Watch TV programs	Community events
Watch movies	Education and training
Online gaming	Health information
	Travel information

e-Solutions Categories for Organizations	
<i>e-Commerce Related</i>	<i>e-Process Related</i>
Selling goods or services	Purchasing goods or services
Deliver services and content	Supplier communication and coordination
Rich media or service creation	Electronic document transfer
Customer service and support	Staff training and skills development
Advertising and promotion	Teleworking
Social networking	Accessing collaborative tools
Web site for organization	Banking and financial
Research by staff	Government transactions
	Access government information

4. Project Area Profile: Northeast Kentucky

This section provides a profile of Internet utilization in the Northeast Region, consisting of **Buffalo Trace, Gateway and FIVCO Area Development Districts**. Data and analysis does not include the Bluegrass Area Development District unless explicit 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 Northeast Kentucky.

Figure 2: Demographic and Economic Profile

Households	Northeast	Kentucky
Population	276,014	4,339,367
Median Household Income	\$34,381	\$40,061
% in Poverty	24.6%	18.4%
% of Population 65+	14.9%	13.3%
Organizations		
Establishments	4,918	90,511
Employment	54,689	1,480,658
Annual Payroll (in billions)	\$1.62	\$51.44
Average Size of Employer	11.1 employees	16.4 employees
USCB County Business Patterns 2009		

The Northeast region has below average (median) income and an older age profile compared to the State. At 18.7% of employment, the retail sector plays a large role in the Northeast region. The manufacturing sector is also important providing 15.1% of employment. The eight largest industries, ranked by annual payroll, that collectively represent over 84% percent of all jobs and payroll in Northeast Kentucky are:

Figure 3: Largest Economic Sectors in Northeast Kentucky (excluding Bluegrass)

Rank	Industry Sector	Percent Employment
1	Retail Trade	18.7%
2	Manufacturing / Processing	15.1%
3	Accommodation & food services	10.7%
4	Health Care & Social Assistance	10.6%
5	Other services (exc. public admin)	4.1%
6	Construction	3.2%
7	Wholesale Trade	3.2%
8	Finance & Insurance	2.7%
% Employment		84.2 %
% of Payroll	83.2%	% of Establishments 72.4%

Figure 4: Age Profile of Northeast Kentucky (excluding Bluegrass)

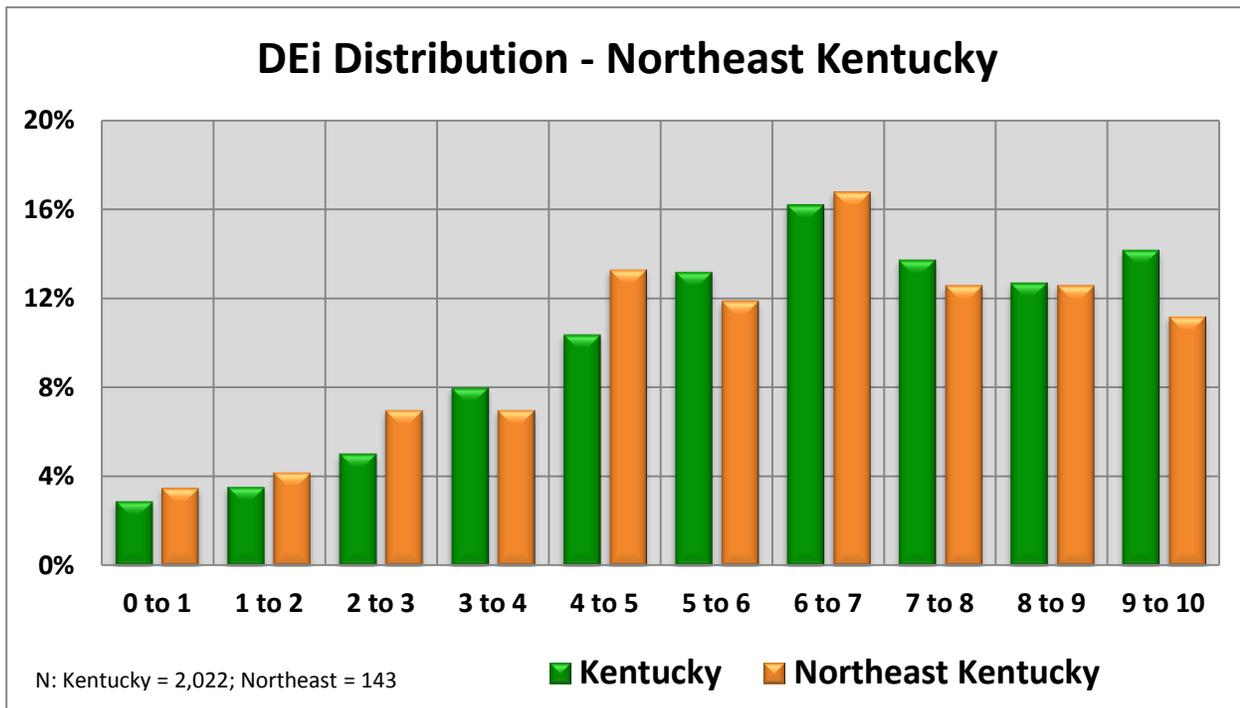
Age Distribution of Adults	Northeast	Statewide
18 to 34 years	21.1%	22.6%
35 to 49 years	20.7%	20.7%
50 to 64 years	20.5%	19.8%
65 years and over	14.9%	13.3%

4.1 Utilization by Organizations in Northeast Kentucky

Internet utilization by organizations in Northeast Kentucky is moderately lower than the state average. The overall Digital Economy Index (DEi) for Northeast Kentucky is 6.02 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	Northeast Kentucky	Ranking by Region
6.41	6.02	N/A

Figure 5: 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 can be seen in the following table:

Figure 6: Internet Utilization by Employment Size: Northeast Kentucky

Organizations by Number of Employees	Kentucky DEi (Median)	Northeast Kentucky DEi (Median)	Sample Size
			Northeast Kentucky
1 to 4	5.83	4.71	35
5 to 49	6.41	6.16	71
50 to 99	6.8	7.14	15
100 or more	7.38	6.70	13
All Size Ranges	6.41	6.02	

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 95 percent of organizations in Northeast Kentucky.

Figure 7: Share of Labor Force by Size of Organizations

Number of Employees	Northeast Kentucky
1 to 19	87.4%
20 to 49	7.8%
50 to 99	2.7%
100 to 499	1.9%
500 or more	0.2%

It is very informative to look at where which industry sectors in Northeast Kentucky vary in their Internet utilization levels from state-wide averages and how they compare to the other four regions. The following industries show relative **strength or weakness within Northeast Kentucky** (inclusive of the Bluegrass Area Development District) 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 8: Strong and Weak Utilization by Industry Sectors

Region	Strong (High DEi or Ranking)	Weak (Low DEi or Ranking)
Northeast Kentucky	<ul style="list-style-type: none"> Manufacturing Financial & Insurance 	<ul style="list-style-type: none"> Retail Trade Wholesale Trade

The following table summarizes utilization for major industries within Northeast Kentucky (according to DEi scores) and compared to the state average, as well as the region’s ranking among the five regions. This table includes data for the Bluegrass Area Development District because data sets are too small for just the Buffalo Trace, Gateway and FIVCO Area Development Districts.

Figure 9: Summary of Utilization (average DEi) Levels by Industry Sector (including Bluegrass)

Major Industry Category	Statewide	Northeast Kentucky	Rank Compared to Other Regions
Finance & Insurance	7.5	7.79	1
Information	6.9	6.83	3
Educational Services	6.7	6.77	2
Manufacturing / Processing	6.6	7.35	1
Retail Trade	6.4	6.01	5
Other services (exc. public admin)	6.3	6.69	1
Professional & Technical	6.2	6.42	2
Wholesale Trade	6.2	5.85	4
Construction	5.8	6.21	2
Health Care & Social Assistance	5.7	5.69	4
Public Administration	5.2	5.19	3

4.1.1 Opportunities and Gaps Based on Utilization

The following is a list of industries that show the largest gaps in utilization for Northeast Kentucky (inclusive of Bluegrass), 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 Northeast Kentucky, areas that have the greatest gaps in utilization, while also being growth sectors, are: retail trade (the region’s largest sector) and Wholesale Trade.

Figure 10: Gaps and Opportunities for Increasing Utilization by Industry Sector

Major Industry Category	Northeast Region Variation from State Average	Sector Size - Rank within Region	Growth Expectation
Retail Trade	-0.34	1	↑
Manufacturing / Processing	0.78	2	↑
Health Care & Social Assistance	-0.04	3	↑
Wholesale Trade	-0.38	5	↑
Professional & Technical Services	0.18	6	↑ ↑
Construction	0.37	7	↑ ↑
Finance & Insurance	0.32	11	
Information	-0.07	12	↓
Public Administration	0.01	n/a	
Gap 1 (0.6 or more below the state DEi)	0		
Gap 2 (0.6 to 0.3 below statewide DEi)	2		

**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 areas with significantly higher growth expectations.*

4.1.2 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 Northeast Kentucky are similar to the rest of Kentucky, with privacy, slow Internet and lack of internal expertise the most frequently cited.

Figure 11: Barriers to Adopting Internet Applications and Processes (excluding Bluegrass)

Barriers to e-Solutions - % Saying Important	North	Statewide
Privacy concerns	70.8%	71.4%
Available Internet is too slow	63.8%	59.2%
Lack of internal expertise and knowledge	51.5%	45.8%
Suppliers not ready	46.9%	41.5%
High cost of development/maintenance	41.5%	45.8%
Loss of personal contact with clients	39.2%	45.1%
Security concerns	37.7%	28.7%
Internal organization resistance	30.0%	24.6%
Uncertain about benefits	26.9%	28.7%
Products not suited to Internet sales	20.0%	24.9%

4.1.3 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 Northeast Kentucky were more modest at 13.5 percent.

Figure 12: Job Creation and Internet Use in Commercial Enterprises (including Bluegrass)

Region	Total Employees	New Jobs Created*	New Jobs Attributed to Internet	% of New Jobs Attributed to Internet*	Number of Reporting Establishments
Northeast Kentucky	3,310	371	50	13.5%	98
Kentucky	15,657	1,731	593	34.3%	401

4.2 Households in Northeast Kentucky

Utilization of the Internet by households in the Northeast Kentucky is very close to the state average. The overall Digital Economy Index (DEi) for households in Northeast Kentucky is 6.15 compared to the statewide DEi of 6.1.

Figure 13: Utilization by Households: DEi Score and Regional Ranking

	Median DEi Score	Rank	Difference from Average	Households in Sample
Northeast Kentucky	6.15	N/A	+0.05	408
Statewide	6.1			4,122

4.2.1 Demographic Effects on Utilization

There are a number of factors that contribute to household utilization in Northeast Kentucky. 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. With a slightly older and significantly less affluent population, it is somewhat surprising that Northeast Kentucky has households with average computer skills and average utilization.

Figure 14: Impact of Age and Income on Internet Utilization (excluding Bluegrass)

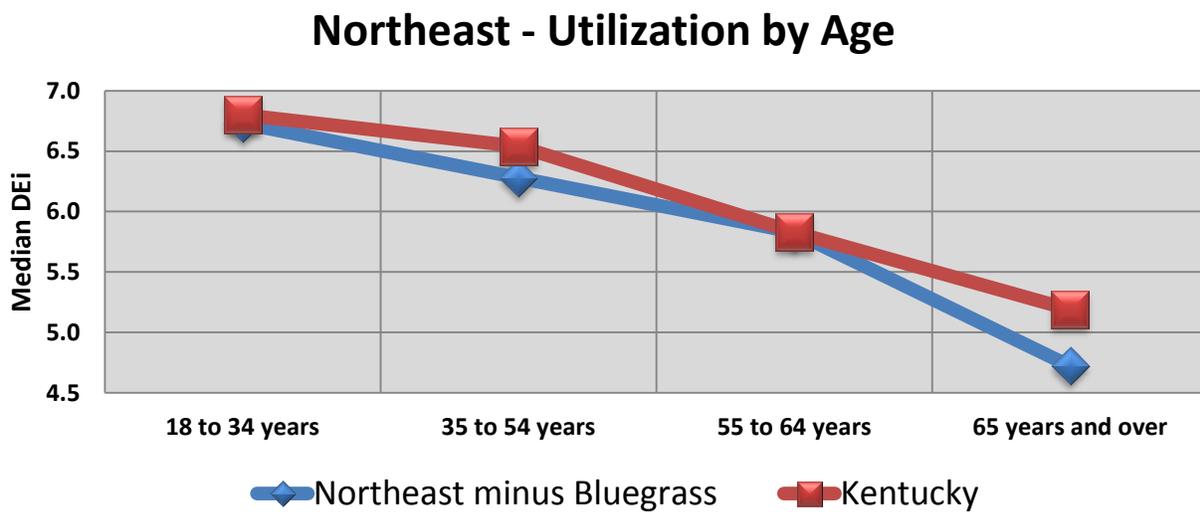
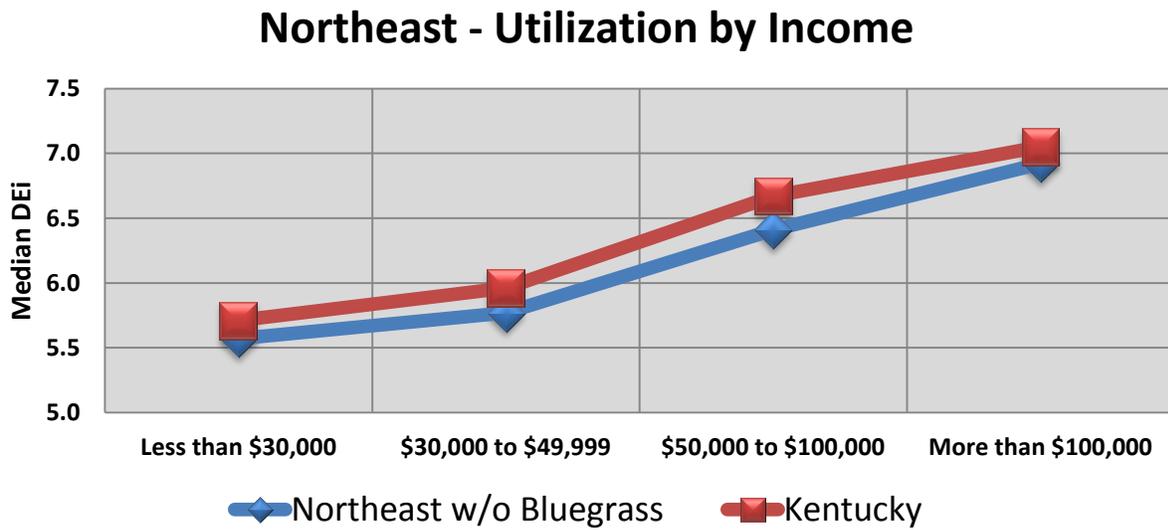
Northeast Kentucky	Household Income			
Respondent Age	Less than \$30,000	\$30,000 to \$49,999	\$50,000 to \$100,000	More than \$100,000
18 to 34	5.62	6.99	6.87	7.07
35 to 54	5.12	5.94	6.17	6.83
55 to 64	5.85	5.24	6.18	6.56
65 years and over	5.24	3.83	4.45	5.29

Figure 15: Computer Skill Levels (excluding Bluegrass)

	Expert user	Use computers with confidence	Know the basics
Northeast Kentucky	24.3%	62.9%	12.5%
Statewide	25.6%	59.9%	14.1%

For Northeast Kentucky, 12.5 percent of households “know only the basics” in computer skill. Northeast 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 16: Northeast Internet Utilization Levels by Age and Income (excluding Bluegrass)



4.2.2 Use of Internet for Productivity

In terms of productivity, households in the Northeast region show above average utilization for work oriented activities, including teleworking, training, and accessing their work place from home.

Figure 17: Percentage of Households Using the Internet for Productivity (excluding Bluegrass)

Northeast Kentucky	% Currently Engaged In	Statewide Average	Variance from State Average
Accessing workplace	52.0%	55.6%	-3.6%
Home business	19.6%	20.8%	-1.2%
Teleworking	19.3%	20.8%	-1.5%
Education or training	48.8%	45.9%	+2.9%

4.3 Focus on Project Area Priorities

The Northeast Region has identified small business utilization of the Internet as their priority focus. This profile provides some insights into the performance of small medium enterprises (SMEs). Readers should keep in mind that the sample sizes for SMEs that participated in the survey are relatively small and should be used with caution. Nonetheless, the data on this priorities areas is suggestive and worth consideration.

As seen in Figure 18, small businesses (with 1 to 19 employees) in the Northeast Region have significantly lower utilization of Internet applications and processes when compared to their peers elsewhere in Kentucky. The gap is even larger when compared to businesses of all sizes across Kentucky. Part of the lower utilization levels can be attributed to the composition of the small business sample in the Northeast compared to the rest of state. The Northeast sample has a higher percentage of its responses from the Health and Social Services sector (which generally has low levels of utilization) and a relatively low number of responses from the Professional and Technical Services sector (which has high levels of utilization).

Figure 18: Percent of Commercial Organizations Using Specific Applications and Processes

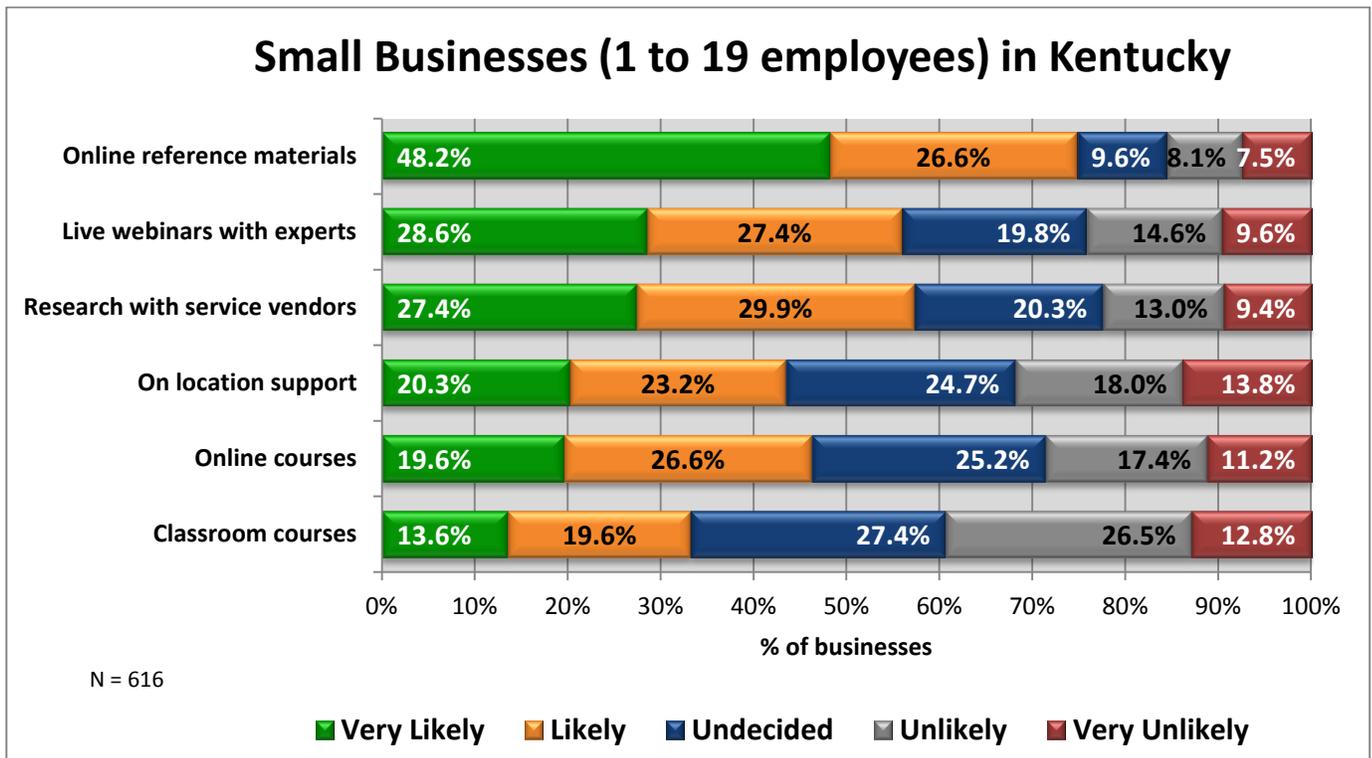
% Currently Using Applications and Processes	Northeast Businesses with 1 to 19 Employees	Kentucky Businesses with 1 to 19 Employees	Kentucky Businesses All Sizes
Median DEi	4.47	6.31	6.60
Electronic document transfer	86.2%	84.8%	86.9%
Research by staff	79.3%	85.2%	86.2%
Purchasing goods or services	72.4%	84.3%	84.1%
Web site for organization	55.2%	75.8%	78.1%
Access government information	69.0%	78.8%	80.6%
Supplier communication and coordination	65.5%	73.8%	77.9%
Banking and financial	62.1%	73.0%	72.5%
Customer service and support	51.7%	65.2%	67.2%
Staff training and skills development	62.1%	60.3%	65.4%
Social networking	51.7%	64.1%	64.0%
Accessing collaborative tools	51.7%	59.5%	63.5%
Advertising and promotion	37.9%	59.6%	62.3%
Government transactions	51.7%	60.6%	61.7%
Selling goods or services	27.6%	53.6%	54.8%
Teleworking	31.0%	39.9%	45.7%
Rich media or service creation	27.6%	42.2%	44.4%
Deliver services and content	27.6%	35.2%	38.7%
Sample Size	35	808	1182

Nonetheless, the difference in utilization levels is large and suggests an underlying pattern within the small business sector in the Northeast. Figure 18 identifies in which applications and processes Northeast small businesses are lagging. Most notable are: business website; customer services; advertising and promotion;

selling goods and services; and rich media or service creation². The areas where Northeast small businesses are lagging are also those areas most closely tied to revenue generation. Consequently, adoption of these applications and processes provide a significant opportunity.

In examining how small businesses in the Northeast can take advantage of this opportunity, it is worth noting that staff training is one area where Northeast small businesses out-perform their state-wide peers. There appears to be interest and willingness to address the performance gaps through training. Survey data show that providing online resources is the preferred choice for acquiring new skills and knowledge. Least preferred are formal courses, either in classrooms or online.

Figure 19: Preferred Learning Methods



Another promising area for exploration with small businesses would be the potential of using cloud solutions to address gaps in utilization. While Northeast businesses reported lower than average use of cloud solutions, this weakness has the potential to become an opportunity.

Figure 20: Percent of Businesses that Currently Use Cloud Solutions

Size and location	% of Businesses	Sample Size
Northeast Businesses with 1 to 19 employees	24.1%	29
Kentucky Businesses with 1 to 19 employees	31.3%	729
Kentucky Businesses All Sizes Ranges	34.5%	1,059

² Rich media describes Web pages that use advanced technology such as streaming video, downloaded programs that interact instantly with the user for advertising.



Appendix 1: Breakdown of Regions by County

North East	County	Population	Median Income	% in Poverty	Incidence of 65+
Buffalo Trace	Bracken	8,488	39,141	16.7%	13.7%
	Fleming	14,348	32,258	21.3%	14.8%
	Lewis	13,870	28,349	28.2%	14.7%
	Mason	17,490	37,987	18.8%	15.1%
	Robertson	2,282	35,050	22.2%	18.7%
		56,478	\$34,557	21.4%	14.9%
Gateway	Bath	11,591	30,574	25.1%	14.7%
	Menifee	6,306	27,241	27.7%	15.9%
	Montgomery	26,499	32,964	21.1%	12.8%
	Morgan	13,923	29,473	30.9%	13.0%
	Rowan	23,333	33,081	26.6%	12.3%
		81,652	\$30,667	26.3%	13.2%
FIVCO	Boyd	49,542	37,496	20.9%	16.6%
	Carter	27,720	33,888	25.0%	14.9%
	Elliot	7,852	27,486	32.4%	14.4%
	Greenup	36,910	39,382	16.0%	17.0%
	Lawrence	15,860	30,855	29.9%	14.2%
		137,884	\$33,821	24.8%	16.0%

Appendix 2: 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.

For more information about the contents in this document, please contact Project Management:

William Bates, Michael Baker Jr., Inc. -- 717.221.2065

Robert Lois, Deputy Project Manager, Michael Baker Jr., Inc. -- 724-495-4045

Baker



strategic
networks group
the broadband economists

Broadband *KY*

West Kentucky Profile

Utilizations and Impacts of Broadband
for Businesses, Organizations and Households



This report was prepared by Strategic Networks Group in
partnership with Michael Baker Jr., Inc.

Baker



September 21st, 2012

Prepared for:

*Commonwealth of Kentucky Office of Broadband
Outreach and Development*



COMMONWEALTH OFFICE
OF BROADBAND OUTREACH
AND DEVELOPMENT
Promoting a 21st century economy



TABLE OF CONTENTS

1. Background, Summary and Recommendations	5
2. State-wide Recommendations	7
3. Starting Points	12
3.1 Organization and Objectives of the Report	12
3.2 Introducing the Digital Economy index (DEi).....	13
4. Project Area Profile: West Kentucky.....	16
4.1 Utilization by Organizations in West Kentucky	17
4.1.1 Opportunities and Gaps Based on Utilization	19
4.1.2 Barriers to Utilization.....	20
4.1.3 Impacts from Increasing Utilization.....	20
4.2 Households in West Kentucky.....	21
4.2.1 Demographic Effects on Utilization	21
4.2.2 Use of Internet for Productivity.....	23
4.3 Focus on Project Area Priorities	23
4.3.1 K – 12 Schools	23
4.3.2 Public Access to the Internet.....	24
Appendix 1: Breakdown of Regions by County	26
Appendix 2: Glossary.....	27
Figure 1: Kentucky Regions.....	11
Figure 2: Demographic and Economic Profile	16
Figure 3: Largest Economic Sectors in West Kentucky	16
Figure 4: Age Profile of West Kentucky	17
Figure 5: Range of Internet Utilization by DEi	17
Figure 6: Internet Utilization by Employment Size: West Kentucky.....	18
Figure 7: Share of Labor Force by Size of Organizations	18
Figure 8: Strong and Weak Utilization by Industry Sectors	18
Figure 9: Summary of Utilization Levels by Industry Sector	19
Figure 10: Gaps and Opportunities for Increasing Utilization by Industry Sector.....	19
Figure 11: Barriers to Adopting Internet Applications and Processes.....	20
Figure 12: Job Creation and Internet Use in Commercial Enterprises	20
Figure 13: Utilization by Households: DEi Score and Regional Ranking	21
Figure 14: Impact of Age and Income on Internet Utilization	21
Figure 15: Computer Skill Levels.....	21
Figure 16: Internet utilization Levels by Age and Income	22

Figure 17: Percentage of Households Using the Internet for Productivity 23
Figure 18: Hours of Access to Public Internet Facilities..... 24

This report is one of several deliverables that are part of the Kentucky Broadband Project of the Commonwealth Office of Broadband Outreach and Development (OBOD), and managed by Michael Baker Jr., Inc. (Baker). Ongoing project reporting, outreach, field work, surveys, data analysis and development and map production incorporate information relating to the Commonwealth's Broadband availability, utilization and adoption in specific regions, including characteristics such as service provider data and coverage areas, industry and business data, and household demographics. The project derives from the American Recovery and Reinvestment Act (ARRA) of 2009; funded from the State Broadband Initiative (SBI), and administered by the National Telecommunications and Information Association (NTIA) for a five-year period from 01/01/2010 to 12/31/2014.

For certain project components, Baker contracted with Strategic Networks Group (SNG) to administer user surveys, and to tabulate, analyze and develop reports based on the collected survey data. The Project Area Profile on the following pages was prepared by Strategic Networks Group under contract and in partnership with Michael Baker Jr. Inc.

This report is the second of two companion documents:

- 1) The Kentucky e-Strategy Report provides a state-wide analysis of utilization of the Internet. This state-wide perspective highlights trends that impact all regions to some degree. The report includes a comparative analysis of the Internet across the five regions of Kentucky: East, Central, West, North and Northeast. (See appendix for list of counties within each of the five regions).
- 2) The second set of documents consists of profiles for areas undertaking broadband planning initiatives in collaboration with the Kentucky Office of Broadband Outreach and Development (OBOD) and the Kentucky Council of Area Development Districts (KCADD). Recommendations from the Kentucky e-Strategy Report are reproduced in section 2 of each area profile, thereby providing a state-wide framework for local and regional broadband planning.

In addition to the documents noted above, the Office of Broadband Outreach and Development and the Kentucky Association of Area Development Districts can access online platforms that include databases on Internet use and impacts, as well as the underlying broadband infrastructure. These online platforms can provide customized reports on specific issues for defined geographic areas or sectors.

The area profiles focus on the specific opportunities and gaps for five geographic areas: Central Kentucky (Lincoln Trail, Lake Cumberland and Barren River Area Development Districts), East Kentucky (Big Sandy, Cumberland Valley and Kentucky River Area Development Districts), Northeast Kentucky (Buffalo Trace, Gateway and FIVCO Area Development Districts), **West Kentucky focusing primarily on the Purchase Area Development District**, and North (KIPDA and Northern Kentucky, excluding Jefferson County).

In each of the geographic areas that are profiled, a broadband planning initiative is being undertaken on an issue specific to that region. In the West Region, that issue is adoption with

emphasis on the education system and community access “hubs”. The planning initiative focuses on the Purchase Area Development District. Section 4.3 of this profile provides data and analysis on K-12 schools and community access within the West Region and the Purchase Area Development District (where sufficient exists). The other parts of this report include:

- **Sections 1 & 2: Background and Recommendations.** These two sections provide a state-wide perspective of issues related to broadband adoption and utilization. Section 2 includes Kentucky wide recommendations that provide a framework for local and regional broadband planning and efforts.
- **Section 3: Starting Points.** This section introduces basic concepts required for comparative analysis of broadband use in regions and sectors across Kentucky.
- **Section 4: Project Area Profile.** This section includes data and analysis specific to the project area – in this case the West Region and Purchase Area Development District.

Those interested in a more detailed exploration of regional performance in broadband utilization are strongly encouraged to contact staff from OBOD and KCADD.

1. Background, Summary and Recommendations

Many communities and regions across Kentucky face significant challenges, among them economic dislocation and an aging population. Most rural areas face the additional challenge of population shifts from rural to urban areas. In the face of these challenges, how can communities and businesses maximize their competitiveness, while improving their quality of life?

One area with significant potential is broadband (essentially high-speed Internet access), which can be leveraged into tangible benefits for communities, businesses and households. Businesses can become more productive, competitive and reach into new markets. Households can access services more easily and often more cheaply. Governments can delivery services more cost effectively.

The first step in benefiting from broadband is acquiring connectivity or access to the Internet. Once access is acquired, the second step is adoption, whereby households, businesses and other organizations begin to use their high-speed Internet access on a regular basis.

The third stage in broadband development is utilization of the Internet in increasingly productive ways that bring concrete benefits, such as jobs, new savings and revenues, and improved quality of life. This report focuses on utilization as the third stage of broadband development.

The benchmarking of Internet utilization in Kentucky is based on data collected in February and March 2012. This report represents an analysis of this data from a regional perspective and is intended to support regional broadband planning.

Utilizing Broadband

The ability to utilize or leverage broadband varies significantly across businesses, organizations and households. Not all businesses or households have been able to turn the potential of broadband into measurable success in terms of jobs, company attraction and retention, increased tax base and revenues, and more efficient and effective citizen services. Turning potential into reality requires skills, training, and both formal and informal support, all in addition to access to broadband availability.

In those industry sectors and communities that already have a large, diverse and modern economy and work force, building broadband infrastructure may be sufficient to realize the potential of broadband. However, many industry sectors, communities, businesses and households have limited Internet related skills and capacity. For these groups, even with state-of-the-art connectivity, leveraging broadband often lags. The consequence is that these communities (and households and businesses) lose out on many of the benefit of broadband. More importantly, over time, these communities are at risk of becoming economically uncompetitive and generally less attractive to households and businesses.

This report examines how organizations and households in West Kentucky differ in their utilization of broadband and where they can look to make improvements. The report shows in detail how industry sectors and household types in West Kentucky compare to each other and to statewide patterns. The report provides insights and hard evidence that allow communities, businesses, and households to assess where they stand and to identify what kinds of actions will improve their performance and benefits.

The report includes statewide recommendations for how the Commonwealth of Kentucky and its regions can improve the utilization of broadband, thereby improving their economies and quality of life. Recommendations are broken down into three areas: gaps and opportunities where regions are lagging in their use of the Internet and broadband; key barriers to improving the use and benefits of Internet and broadband; and the best ways to build skills and abilities. Analysis and recommendations are identified for both organizations (commercial and non-commercial) and households. For the purposes of this report, regional analysis has been organized into five distinct regions of Kentucky: North, Northeast, East, West, and Central. The composition of these five regions is outlined in Appendix 1.

*This report uses data collected in February through April 2012 across Kentucky. A total of 2,231 organizations and 4,122 households contributed to the state-wide broadband benchmarking effort. The sample for West Kentucky is 458 organizations and 1,030 households.**

* A summary of the findings from the 2012 benchmarking effort can be found in the *Broadband KY e-Solutions Benchmarking Technical Report* (May 2012). The number of responses collected in this analysis is substantial, especially when compared to national polls.

2. State-wide Recommendations

To assist stakeholders and communities to better understand and use this report, the recommendations of the Kentucky e-Strategy Report were structured around fundamental questions that leaders and decision-makers face in terms of leveraging broadband for the socio-economic benefit of their communities and constituents.

1. How important is high-speed Internet access to Kentucky, its communities and its residents?

In the twenty-first century, high-speed Internet access has been 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 high-speed Internet access speaks directly to a community's viability, competitiveness and quality of life. However, each region and community has its own unique characteristics, assets and challenges. Current Internet usage and opportunities for development vary widely, as explored in detail in the various sections of this report. Each region requires strategies and initiatives that address its unique situation. The Commonwealth can provide support, but social and economic developments are essentially local and regional in nature.

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.

Benchmarking Data for Kentucky, May 2012.

Recommendation #1: *Each region or groups of communities must develop its own strategy and initiatives based on its own characteristics, values and priorities.*

2. Where are the major gaps or weaknesses in utilization of the Internet?

Prioritizing industry sectors and other economic groups must be done within a regional context. While factors such as industry size within each region are considered, additional factors and considerations exist within each region, such as key industry sectors in decline or regional strategies for developing specific sectors. In general, focus should be on industry sectors that make the largest contribution to the economy and that have the greatest growth potential.

Key gaps in Internet utilization are focused on household income, age, and skill level, degree of "rurality", and organizational size and industry sector.

Recommendation #2: *Focus on high opportunity industry sectors within each region rather than undertaking broad but untargeted initiatives.*

3. How do we use the potential of the Internet to maximize job creation?

Small to medium sized organizations should be a focus for all regions. This segment is important for the following reasons:

- Includes 95% of all establishments and 43% of all employment in Kentucky
- Has the lowest or weakest utilization levels compared to organizations with larger numbers of employees
- Is a dynamic engine for employment growth, especially through use of the Internet
- Has the least capacity and expertise to adopt more sophisticated and productive Internet applications

Recommendation #3: *Focus on the small-medium enterprise segment, especially 1-49 employees, to increase Internet utilization, thereby driving competitiveness, revenues and job creation.*

4. In what areas do small to medium sized business need help?

Broadband KY e-Solutions Benchmarking (eSB) identifies which types of Internet enabled applications and processes are relatively easy or hard to adopt, especially by small to medium sized organizations. Using data on barriers to adoption, action plans can be defined at the regional level to address target groups. Note: e-solutions is the term used in this report 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.

Recommendation #4: *Initiatives aimed at increasing utilization among the small to medium enterprise segment should focus on the following 10 utilization categories:*

1. *Delivery of services and content*
2. *Rich media or service creation¹*
3. *Teleworking*
4. *Staff training and skills development*
5. *Advertising and promotion*
6. *Social networking*
7. *Government transactions*
8. *Customer service and support*
9. *Selling goods or services*
10. *Supplier communication and coordination*

¹ Rich media describes Web pages that use advanced technology such as streaming video, downloaded programs that interact instantly with the user for advertising.

5. How can we reach households that have not adopted the Internet or use it only minimally?

Many households that use the Internet still do not use the Internet very productively. Low utilization households are very similar to non-adopting households. They are disproportionately older and lower income. Households with low Internet adoption represent an important group due to the social and economic benefits that can be accessed through the Internet. As governments and businesses move their services to the Internet to achieve better reach and cost efficiencies, it is increasingly important that citizens have the ability to access and benefit from these online services. However, a large portion of lower income and older households have difficulty adopting and using the Internet. Given that low adoption and utilization is strongly tied to age and income, training should be targeted at people over 64 and households with lower incomes.

The poorer one is and the older one is, the less likely one uses the Internet and the less productively one uses it.

Recommendation #5: *Develop training programs and resources that target households over the age of 64 or have below average incomes.*

6. Is it true that the rural areas have a particularly hard time in adopting and using the Internet?

Yes! While both urban and rural households struggle to use and benefit from the Internet, rural households are relatively disadvantaged, with households being generally older and having lower average incomes. Non-metropolitan areas with significantly lower utilization levels compared to metropolitan areas. Consequently, non-metropolitan households tend to have greater difficulty in accessing educational, health and government services, all of which are increasingly available online.

Recommendation #6: *Non-metropolitan areas are a priority for Internet training programs and resources.*

Rather than trying to entice target populations into existing programs (such as classroom courses) Internet training initiatives should reflect the preference for both self-directed online resources, as well as existing informal networks that already have participation by these target groups. These can include seniors' centers, libraries, churches and community centers.

7. How can we help citizens of Kentucky make better use of the Internet?

Rather than trying to entice target populations into existing programs (such as classroom courses), e-solution adoption initiatives should reflect the preference for both self-directed online resources, as well as existing informal networks that already have participation by these target groups. These can include seniors' centers, libraries, churches and community centers.

Recommendation #7: In designing initiatives to increase and improve Internet utilization by households and organizations, considerable weight should be given to those learning methods that are preferred by the target populations.

The preferred learning methods of 47% of those over 65 in Kentucky are “talking to others” and “online information”. The least preferred learning methods were “workshops” and “classrooms courses” (preferred by 16%).

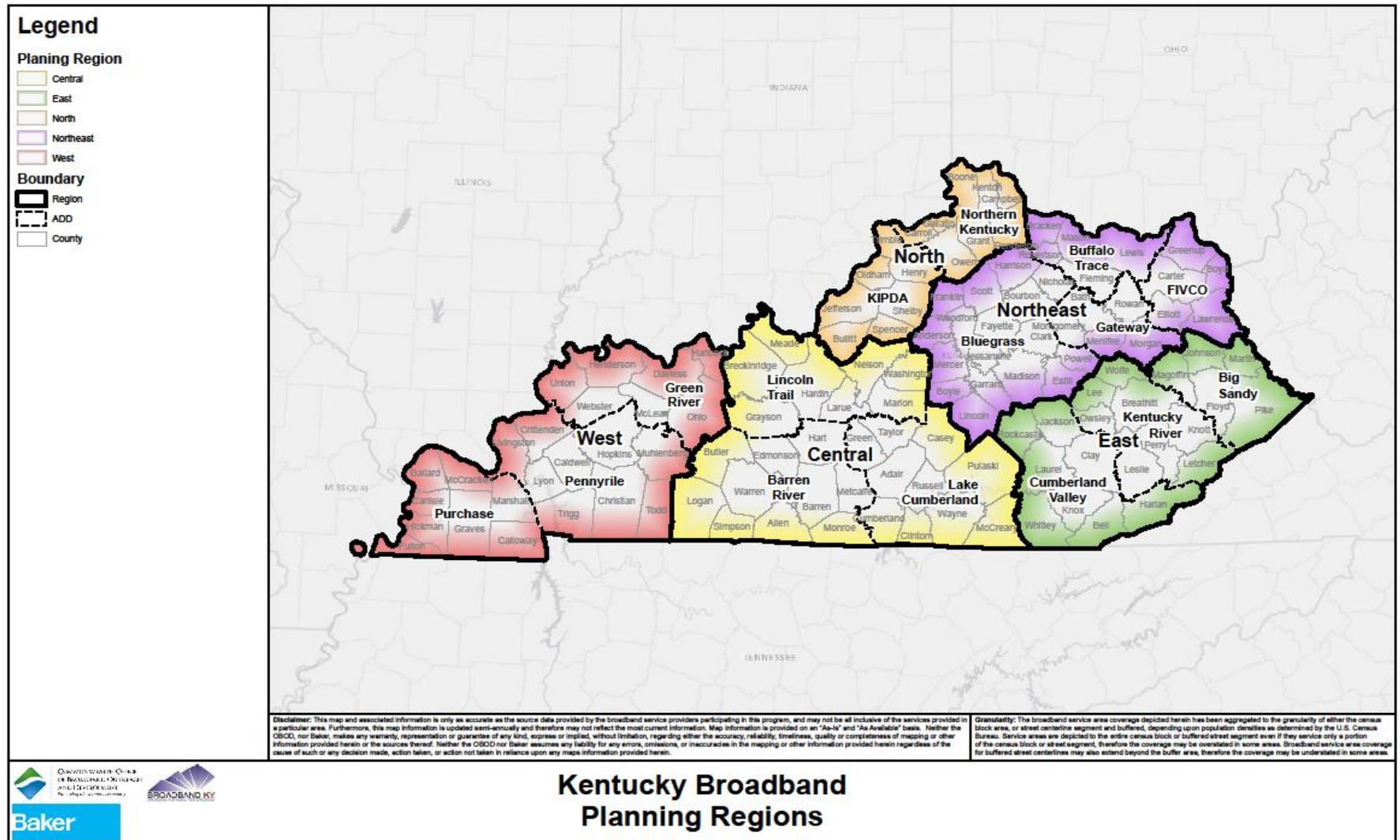
8. How can those who do not use the Internet be assisted to start using the Internet in ways that produce tangible benefits?

Approximately one in five individuals in Kentucky does not use or benefit from the Internet. The largest group of non-Internet users are those 65 years and older. However, lower income households also have significantly lower rates of Internet adoption.

Barriers to Internet adoption vary significantly by type of household. Almost half of non-adopting older households see little value in the Internet, while generally being less skilled in use of computers and Internet. Working age individuals tend to have better computer and Internet skills, but find having Internet at home too expensive. These working age ‘non-adopters’ are more likely to have children at home and have at least one other person in the household who uses the Internet. These working age households are less likely to be completely isolated from the Internet.

Recommendation #8: *Broadband adoption programs should focus on those key groups that face persistent barriers to adoption, specifically elderly households and lower income households where no-one else in the household uses the Internet. Internet adoption programs should be design to address specific barriers facing their targeted group.*

Figure 1: Kentucky Regions



3. Starting Points

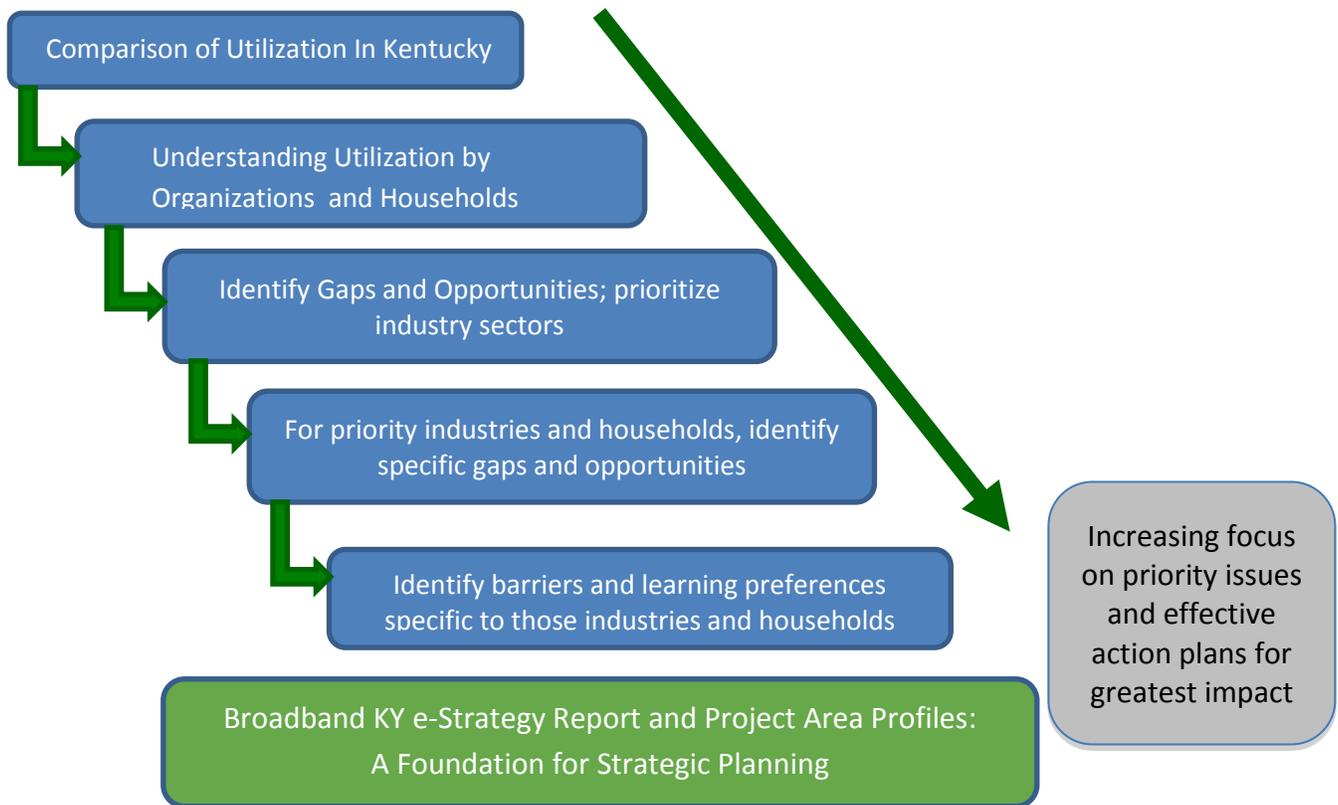
3.1 Organization and Objectives of the Report

This report is designed to be a catalyst for leveraging broadband through actionable intelligence. The chart below outlines steps used in this report to move from descriptive data to detailed analysis of targets, priorities and strategies. The ultimate goal of the analysis of broadband in Kentucky is to:

1. Identify which segments of the regional economy utilize the Internet to a greater or lesser degree;
2. Prioritize the segments that show utilization gaps based on importance to the regional economy and opportunity to address the gaps; and,
3. Identify specific uses of the Internet that should be addressed to close the gaps, resulting in effective actions that are targeted where they will have the most impact.
4. Identify the barriers to improved Internet utilization, as well as the best means to overcome them.

For those interested in a more detailed exploration of regional or local performance in broadband utilization, you are strongly encouraged to contact regional outreach staff from the Kentucky Office for Broadband Outreach and Development.

Leveraging Broadband for Economic and Social Development



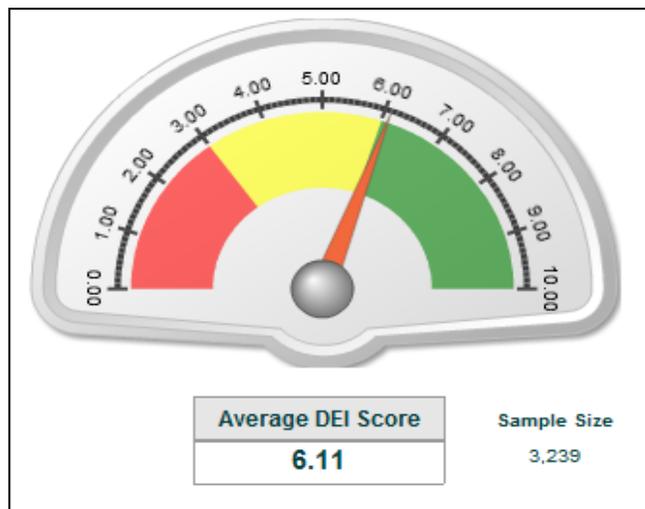
3.2 Introducing the Digital Economy index (DEi)

This report includes comparisons of Internet use between regions by various characteristics, such as industry, business size, and household demographics. To assist in the process of making comparisons, a mechanism was developed for establishing benchmarks. Benchmarks are useful in creating reference points against which the performance of any individual or group can be compared. Strategic Networks Group has developed a benchmarking process based on its Digital Economy index (DEi).

The Digital Economy index (DEi) reflects an organization’s or household’s utilization of a range of Internet applications and process – 17 for organizations and 30 for households. These applications and processes (e-solutions) are listed on the following pages. 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. A separate DEi is used to compare how different types of households use the Internet.

An organization’s or household’s DEi score (from 0 to 10) captures that their utilization of e-solutions, with 10 being the highest possible use. DEi scores are averaged across groups of users by various categories: e.g. a sector’s DEi is the average for all organizations in that sector. The DEi is used as a basis for comparison of utilization levels across various dimensions.

Identifying variations in DEi assists in focusing on areas where a deeper assessment is warranted. In areas where DEi is lower than average, indicating lower utilization, there is an opportunity to increase utilization and benefits to organizations and households.



DEi Meter from dashboard of the Digital Economy Analytics Platform.

The Color Coding for DEi Scores: To better show how industry sectors perform, the DEi tables in this report are color coded from the highest (green) to lowest (red) to highlight how DEi scores compare. The color coding (green to red) allows one to quickly compare groups based on how utilization varies.

Highest
2
3
4
5
6
Lowest
Insufficient Data

Different DEi comparisons can be useful for different purposes, for example:

- Individual organizations can compare their DEi score with a benchmark average DEi score for their industry in their region. This can provide insights into how well an organization is performing in terms of Internet use compared to their peers.

- Broadband planners and economic development agencies can compare DEi benchmarks between different organization characteristics, such as industries and business sizes, to gain insights into relative utilization levels to aid in targeting low utilization groups. They can also compare DEi benchmarks on a regional basis to aid in planning.
- Providers of broadband services and infrastructure can use DEi benchmarks to gain insights into where high utilization levels exist and where low utilization level need to be addressed in order to promote the greatest use from their broadband investments.

e-Solutions refer 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-Solutions Categories for Households	
Communication	Transactions
E-mail	Buying goods or services
Voice over IP	Selling items
Online chat	Investments / trading
Sharing information	Online banking
Personal website	Paying bills
Productivity	Government services
Education or training courses	Music or video download
Accessing workplace	Software download
Teleworking	Booking travel
Home business	Research
Recreation	Product information
News and sports	Investments
Listen to radio	Government information
Watch TV programs	Community events
Watch movies	Education and training
Online gaming	Health information
	Travel information

e-Solutions Categories for Organizations	
<i>e-Commerce Related</i>	<i>e-Process Related</i>
Selling goods or services	Purchasing goods or services
Deliver services and content	Supplier communication and coordination
Rich media or service creation	Electronic document transfer
Customer service and support	Staff training and skills development
Advertising and promotion	Teleworking
Social networking	Accessing collaborative tools
Web site for organization	Banking and financial
Research by staff	Government transactions
	Access government information

4. Project Area Profile: West Kentucky

This section provides a profile of Internet utilization in the West Region, consisting of the Purchase, Pennyryle and Green River Area Development Districts. Most of the material is taken from the Kentucky e-Strategy Report and consolidated into one area-specific profile. Additional data is provided for the Purchase ADD, where available. The Purchase ADD is a planning priority for Broadband Kentucky.

For context in prioritizing regional planning activities it is important to consider the overall profile of the population and economy of West Kentucky.

Figure 2: Demographic and Economic Profile

Households	Purchase ADD	West Region	Kentucky
Population	196,393	629,170	4,339,367
Median Household Income	\$38,027	\$39,030	\$40,061
% in Poverty	18.4%	17.5%	18.4%
% of Population 65+	17.1%	15.4%	13.3%
Organizations			
Establishments	4,676	13,268	90,511
Employment	71,646	199,490	1,480,658
Annual Payroll (in billions)	\$2.28	\$6.38	\$51.44
Average Size of Employer	15.3 employees	15 employees	16.4 employees
USCB County Business Patterns 2009			

The West region and Purchase ADD have slightly below average (median) income and an older age profile compared to the State. The Purchase ADD has proportionally 28% more people 65 and older compared to Kentucky as a whole. At 16.8% of employment and 22.5% of payroll, manufacturing plays a large role in the West region. The manufacturing sector consists of primarily larger than average establishments, with only 5.1% of all businesses classified as manufacturing. The eight largest industries, ranked by annual payroll, that collectively represent over 75 percent of the economy in West Kentucky are:

Figure 3: Largest Economic Sectors in West Kentucky

Rank	Industry Sector	Percent Employment
1	Manufacturing / Processing	16.8%
2	Health Care & Social Assistance	16.3%
3	Retail Trade	15.2%
4	Accommodation & food services	9.9%
5	Construction	5.2%
6	Wholesale Trade	4.6%
7	Other services (exc. public admin)	4.5%
8	Transportation & Warehousing	3.8%
% Employment		76.4%
% of Payroll	71.5%	% of Establishments 79.4%

Figure 4: Age Profile of West Kentucky

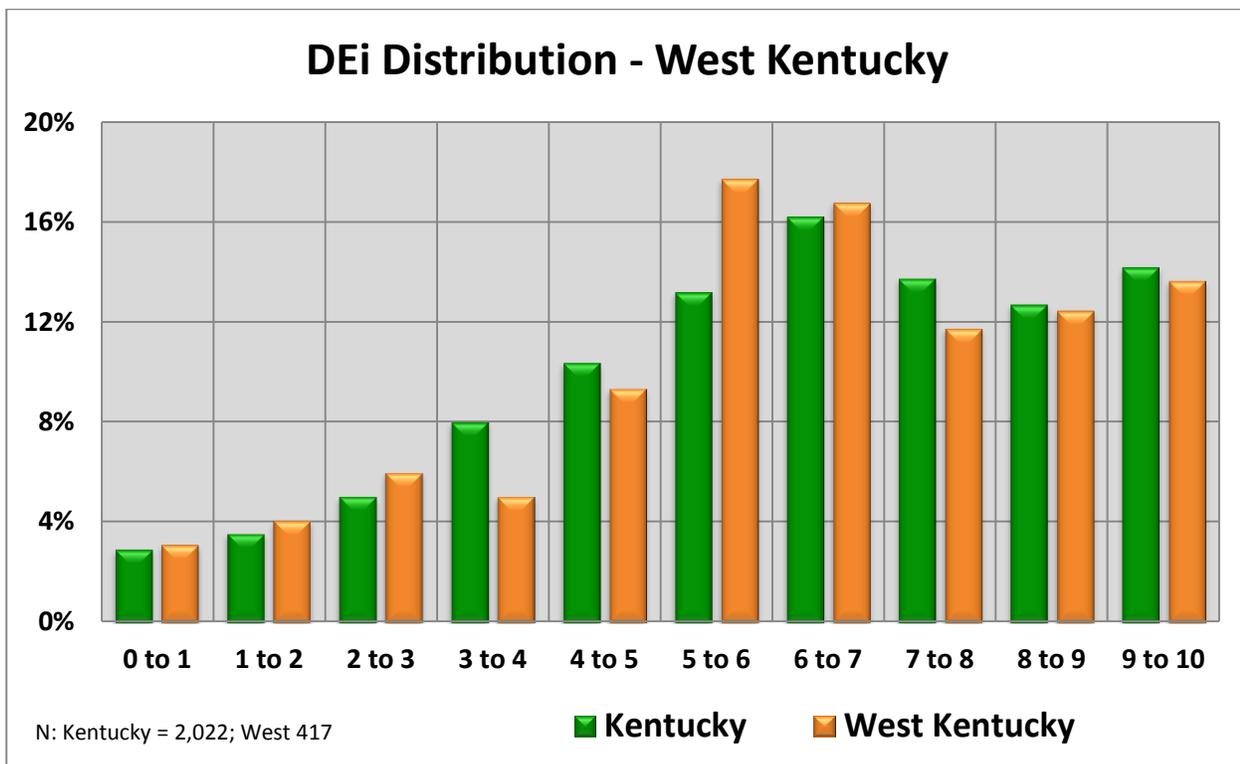
Age Distribution of Adults	West	Statewide
18 to 34 years	21.8%	22.6%
35 to 49 years	19.4%	20.7%
50 to 64 years	20.0%	19.8%
65 years and over	15.4%	13.3%

4.1 Utilization by Organizations in West Kentucky

Internet utilization by organizations in West Kentucky is moderately lower than the state average. The overall Digital Economy Index (DEi) for West Kentucky is 6.31 compared to the statewide DEi of 6.41 (based on 458 responses). This ranks West Kentucky fourth out of the five regions. The Purchase ADD, however, has an above average utilization (DEi of 6.51 - based on 166 responding organizations). The West Region’s profile of utilization levels from low (1) to high (10), mimics statewide patterns (Figure 5).

Median DEi Score			
Kentucky	West Kentucky Region	Ranking by Region	Purchase ADD
6.41	6.31	4 of 5	6.51

Figure 5: 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 can be seen in the following table:

Figure 6: Internet Utilization by Employment Size: West Kentucky

Organizations: Employment Range	Kentucky	West Kentucky	Sample Size West Kentucky
1 to 4	5.83	5.92	121
5 to 49	6.41	6.21	195
50 to 99	6.80	6.94	36
100 or more	7.38	7.57	32
All Size Ranges	6.41	6.31	394

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 95 percent of organizations in West Kentucky.

Figure 7: Share of Labor Force by Size of Organizations

Number of Employees	West Kentucky
1 to 19	85.9%
20 to 49	9.1%
50 to 99	2.7%
100 to 499	2.1%
500 or more	0.2%

It is very informative to look at which industry sectors in West Kentucky vary in their Internet utilization levels from state-wide averages and how they compare to the other four regions. The following industries show relative **strength or weakness within West 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 8: Strong and Weak Utilization by Industry Sectors

Region	Strong (High DEi or Ranking)	Weak (Low DEi or Ranking)
West Kentucky	<ul style="list-style-type: none"> • Retail Trade • Educational Services 	<ul style="list-style-type: none"> • Professional & Technical Services • Information Services • Financial & Insurance • Manufacturing • Health Care & Social Assistance

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

Figure 9: Summary of Utilization Levels by Industry Sector

Major Industry Category	Statewide	West Kentucky	Rank Compared to Other Regions
Finance & Insurance	7.5	7	5
Information	6.9	6.2	5
Educational Services	6.7	6.8	1
Manufacturing / Processing	6.6	6.1	4
Retail Trade	6.4	6.9	1
Other services (exc. public admin)	6.3	6.6	2
Professional & Technical	6.2	5.3	5
Wholesale Trade	6.2	5.9	3
Construction	5.8	5.7	3
Health Care & Social Assistance	5.7	5.8	3
Public Administration	5.2	5.1	4

4.1.1 Opportunities and Gaps Based on Utilization

The following is a list of industries that show the largest gaps in utilization for West 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 West Kentucky areas that have the greatest gaps in utilization, while also being growth sectors, are: manufacturing (the region’s largest sector) and Professional and Technical Services .

Figure 10: Gaps and Opportunities for Increasing Utilization by Industry Sector

Major Industry Category	West	Sector Size - Rank	Growth Expectation*
Manufacturing / Processing	-0.48	1	↑
Health Care & Social Assistance	0.11	3	↑
Retail Trade	0.57	2	↑
Construction	-0.09	5	↑ ↑
Wholesale Trade	-0.3	6	↑
Finance & Insurance	-0.45	9	
Professional & Technical Services	-0.97	11	↑ ↑
Information	-0.71	13	↓
Public Administration	-0.08	n/a	
Gap 1 (0.6 or more below the state DEi)	2		
Gap 2 (0.6 to 0.3 below statewide DEi)	3		

*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 areas with significantly higher growth expectations.

4.1.2 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 West Kentucky are similar to the rest of Kentucky, with privacy, slow Internet and lack of internal expertise the most frequently cited. Barriers for organizations in the Purchase ADD are very similar to the West region.

Figure 11: Barriers to Adopting Internet Applications and Processes

Barriers to e-Solutions - % Saying Important	West	Statewide
Privacy concerns	73.4%	71.4%
Available Internet is too slow	58.1%	59.2%
High cost of development/maintenance	46.5%	45.8%
Loss of personal contact with clients	46.2%	45.1%
Lack of internal expertise and knowledge	43.3%	45.8%
Suppliers not ready	43.0%	41.5%
Security concerns	32.5%	28.7%
Uncertain about benefits	32.2%	28.7%
Products not suited to Internet sales	26.1%	24.9%
Internal organization resistance	25.0%	24.6%

4.1.3 Impacts from Increasing Utilization

Increased utilization by organizations results in increased revenue and job creation. Increasing an organization’s D Ei 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 West Kentucky were more modest, but still impressive at 33.3 percent.

Figure 12: 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
West Kentucky	3,326	415	138	33.3%	81
Kentucky	15,657	1,731	593	34.3%	401

4.2 Households in West Kentucky

Utilization of the Internet by households in the West Kentucky is slightly lower than the state average. The median Digital Economy Index (DEi) for households in West Kentucky is 6.22 compared to the statewide DEi of 6.35. Notably, the Purchase ADD has a higher median utilization than both the West Region and Kentucky as a whole. This pattern is similar to utilization levels by organizations, where the Purchase ADD scored higher than both the West Region (of which it is part) and the state.

Figure 13: Utilization by Households: DEi Score and Regional Ranking

	Median DEi Score	Rank	Difference from State	Households in Sample
West Kentucky	6.22	3 (Tied)	-0.13	1030
Purchase ADD	6.47		0.12	296
Statewide	6.35			4,122

4.2.1 Demographic Effects on Utilization

There are a number of factors that contribute to higher household utilization in West Kentucky. With a slightly older and slightly less affluent population, it is no surprise that West Kentucky has households with lower than average computer skills and lower than average utilization. Households in Purchase ADD rated their computer skills to be similar to the West Region. 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. However, households in the Purchase ADD have significantly higher Internet utilization than what would normally be expected given the high numbers of seniors and slightly lower than average incomes.

Figure 14: Impact of Age and Income on Internet Utilization

West 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	6.12	6.89	6.74	7.47
35 to 54	5.21	5.85	6.63	6.92
55 to 64	4.90	5.27	5.90	6.00
65 years and over	4.76	4.42	5.52	5.63

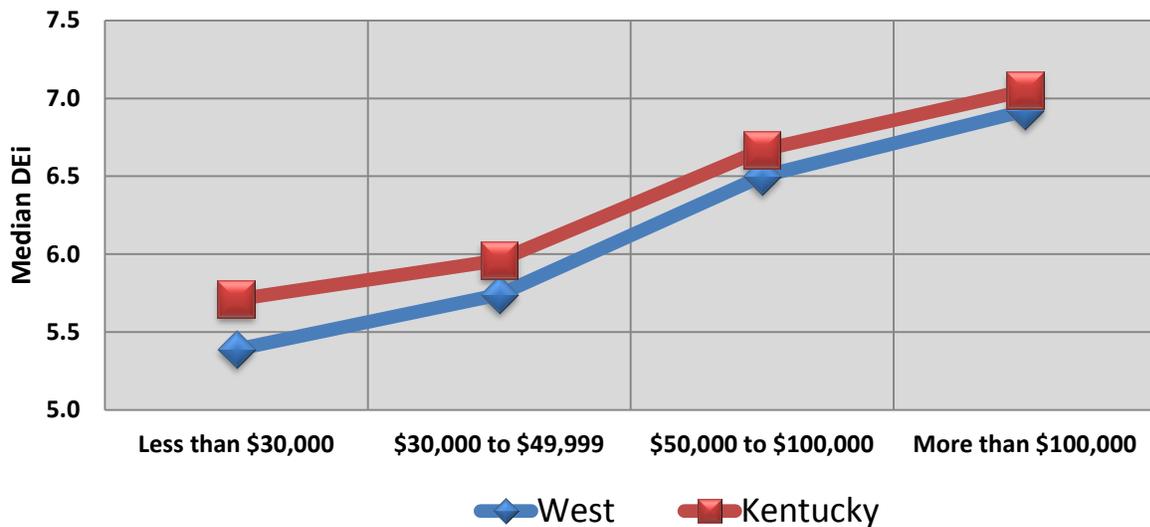
Figure 15: Computer Skill Levels

	Expert user	Use computers with confidence	Know the basics
West Kentucky	22.4%	62.3%	15.0%
Statewide	25.6%	59.9%	14.1%

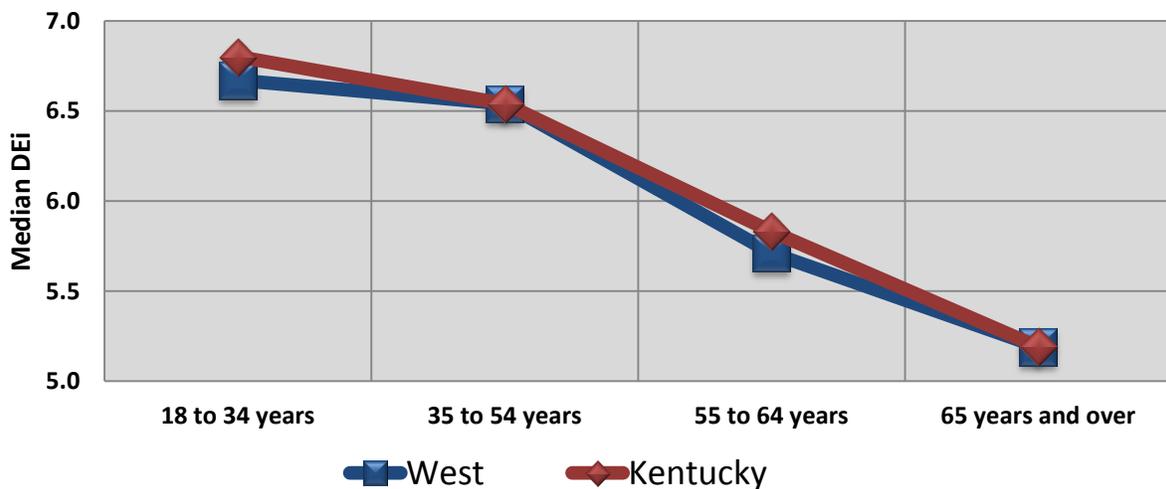
West Kentucky households face the same statewide issues of relatively low utilization by those over 55, with lower incomes and poor computer skill level. As a factor that can be addressed through broadband support initiatives, targeting computer skill development at these groups is a clear priority and likely to have the greatest impact on increasing utilization and consequently on the ability of households to earn income and access government services.

Figure 16: Internet utilization Levels by Age and Income

West - Utilization by Income



West - Utilization by Age



4.2.2 Use of Internet for Productivity

In terms of productivity, households in the West region show below average utilization for work oriented activities, including telecommuting, training, and accessing their work place from home. In contrast, households in the Purchase ADD have higher than state averages for using the Internet for home-based businesses, telecommuting and education and training.

Figure 17: Percentage of Households Using the Internet for Productivity

West Kentucky	West Kentucky	Statewide Average	Variance from State Average
Accessing workplace	52.0%	55.6%	-3.6%
Home business	19.5%	20.8%	-1.3%
Teleworking	15.8%	20.8%	-5.0%
Education or training	42.2%	45.9%	-3.7%

	Purchase ADD	Statewide Average	Variance from State Average
Accessing workplace	54.4%	55.6%	-1.2%
Home business	22.1%	20.8%	1.3%
Teleworking	22.5%	20.8%	1.7%
Education or training	46.9%	45.9%	1.0%

4.3 Focus on Project Area Priorities

The West Region has identified adoption and utilization as their priority focus, especially among the younger population. This profile provides some insights into the performance of the region in the areas of K – 12 schools and sites for public access to the Internet. Readers should keep in mind that the sample sizes for K – 12 schools and public access sites are relatively small and should be used with caution. Nonetheless, the data on these two priorities areas is suggestive and worth consideration.

4.3.1 K – 12 Schools

Twelve K – 12 schools from the Purchase ADD area and 31 schools from the West region responded to the state broadband utilization survey. The survey included both generic questions to determine general patterns of Internet use, as well as a small number of customized questions for those organizations that identified themselves as educational institutions. On average, schools from the West Region were similar to their peers across the State in their use of generic Internet applications and processes. However, West region schools showed a distinctly higher utilization of Internet applications and process patterns specific to the educational sector. These include such areas as: online delivery of instruction; marketing and recruiting students; and remote data entry. The twelve schools from the Purchase ADD had a distinctly higher use of

generic Internet applications, compared to the average from both the state and the West region. For specialized educational uses, schools in the Purchase area showed a similarly higher level of utilization than the state average, except in the area of online delivery of instruction.

4.3.2 Public Access to the Internet

The statewide survey made an effort to identify sites that provide public access to the Internet through computer terminals and free on-site Wi-Fi networks. Fifty seven organizations stated that they provided such services in the West Region. Twenty four of these were from the Purchase ADD.

What is evident from the reported data is that facilities in the Purchase ADD have more restricted hours than most facilities across the West region and across Kentucky. Admittedly this conclusion is based on a relatively small sample. However, if the data is representative of the situation in the Purchase ADD, consideration should be given to extending hours of public access to evenings and weekends.

Figure 18: Hours of Access to Public Internet Facilities

West Region		
Availability of Public Access Facilities	% of Establishments	# of Establishments
Weekdays	98.3%	57
Evenings	44.8%	26
Weekends	36.2%	21

Purchase ADD		
Availability of Public Access Facilities	Pct. Establishments	# Establishments
Weekdays	100%	24
Evenings	33.3%	8
Weekends	25.0%	6

Kentucky		
Availability of Public Access Facilities	Pct. Establishments	# Establishments
Weekdays	98%	241
Evenings	47%	115
Weekends	38%	95



Appendix 1: Breakdown of Regions by County

West	County	Population	Median Income	% in Poverty	Incidence of 65+
Kentucky		4,339,367	\$40,061	18.4%	13.3%
Green River	Daviess	96,656	\$43,031	15.2%	14.6%
	Hancock	8,565	\$48,464	13.2%	14.0%
	Henderson	46,250	\$42,438	16.7%	14.2%
	McLean	9,531	\$37,766	16.4%	16.9%
	Ohio	23,842	\$37,965	17.4%	15.4%
	Union	15,007	\$42,252	16.7%	13.7%
	Webster	13,621	\$40,803	17.1%	15.1%
		213,472	\$42,123	16.1%	14.6%
Pennyrile	Caldwell	12,984	\$35,252	17.4%	17.8%
	Christian	73,955	\$35,785	19.0%	10.3%
	Crittenden	9,315	\$35,330	19.0%	18.1%
	Hopkins	46,920	\$36,518	20.7%	15.4%
	Livingston	9,519	\$40,921	14.7%	18.1%
	Lyon	8,314	\$39,417	18.4%	21.0%
	Muhlenberg	31,499	\$35,163	19.2%	16.2%
	Todd	12,460	\$38,678	18.4%	14.2%
Trigg	14,339	\$42,967	15.3%	19.0%	
		219,305	\$36,796	18.0%	14.5%
Purchase	Ballard	8,249	39,995	14.9%	17.6%
	Calloway	37,191	34,947	20.2%	15.1%
	Carlisle	5,104	35,853	15.7%	18.9%
	Fulton	6,813	27,524	27.8%	18.0%
	Graves	37,121	34,550	20.2%	16.6%
	Hickman	4,902	37,045	18.6%	20.8%
	Marshall	31,448	41,891	14.3%	19.3%
	McCracken	65,565	40,976	15.5%	16.8%
		196,393	\$38,027	18.4%	17.1%

Appendix 2: 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.

For more information about the contents in this document, please contact Project Management:

William Bates, Michael Baker Jr., Inc. -- 717.221.2065

Robert Lois, Deputy Project Manager, Michael Baker Jr., Inc. -- 724-495-4045

Baker



strategic
networks group
the broadband economists