



# **The Economic Impact of Stimulating Broadband Nationally**

**A Report from Connected Nation, Inc.**

**February 21, 2008**

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# Broadband Legislation Would Provide Economic Stimulus of \$134 Billion Annually



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February 21, 2008

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Report outlines economic impact of broadband bills providing a second opportunity for Congress to stimulate the nation's economy.

**Washington, D.C.:** A report released by national non-profit Connected Nation measures the national economic stimulus of broadband legislation currently under Congressional consideration. The report details the potential state-by-state impact of legislation to accelerate broadband access and use. Its findings suggest that the U.S. could realize an impact of \$134 billion annually from a modest increase in broadband adoption.

“Just as the Congress needed to pass the recent economic stimulus package to accelerate the economies of every state, so too does the nation deserve passage of pending legislation that could accelerate access to and use of broadband. The beauty of the broadband legislation currently in play in the midst of Farm Bill negotiations is that it would provide a jolt to the nation's economy in the near term – to the tune that rivals the recent economic stimulus package” said Brian Mefford, Connected Nation's CEO.

The Connected Nation report measures the impact of its first state-based program, ConnectKentucky. Kentucky has experienced a rate of growth in broadband adoption (i.e. the number of households subscribing to high-speed broadband service) that is measurably higher than the nation. Kentucky experienced an 83% rate of growth in broadband adoption while the national trend was 57%. By surveying consumer savings in time, miles driven and healthcare and by calculating the impact on job creation/retention, the report projects the estimated annual economic benefit for Kentucky. From this data, Connected Nation extrapolated the economic impact of modest growth in broadband adoption for each state and the country as a whole.

If Congress passes legislation that enables every state to implement programs modeled after ConnectKentucky and experience an increase in broadband adoption, the direct economic stimulus would be more than \$134 billion per year for the nation, according to the report.

According to Larry Cohen, president of the Communications Workers of America, "The Communications Workers of America has long been pressing for public policies that will allow all Americans to share in today's telecommunications revolution and for our nation to fully utilize the economic engine of the 21st century. Economic growth, quality jobs and the tremendous opportunity for improvement in the personal lives of all Americans depends on substantial improvements in speed, quality and most critically, the build out of true high-speed Internet networks. At the current rates of broadband speed in the United States, the promise of telemedicine, distance learning and civic participation simply isn't possible. And both developed and developing regions – Europe, Korea and parts of southeast Asia, eastern Europe and more – have moved far ahead of us. This economic impact study spotlights not only the positive benefits that will result from the build out of true high-speed broadband networks, but reinforces the critical need for a national broadband policy and the broadband mapping bills that Congress now is considering."

In 2007, the U.S. House of Representatives voted unanimously to pass such legislation, and the U.S. Senate passed a similar proposal as part of a renewal of the Farm Bill. The Senate and the House are working to complete negotiations on the Farm Bill, including rural development and broadband elements, this month. However, in the result of a broadband stalemate during Farm Bill discussions, the country's unserved areas would likely see little help in the near term.

"Connected Nation provides convincing evidence that the benefits of broadband adoption spill over to society as a whole," said Dr. Robert D. Atkinson, president of the Information Technology & Innovation Foundation. "Moreover, the report rightly concludes that public policies to spur broadband are critical to ensure the best possible broadband future for the United States."

Connected Nation has garnered international, industry-wide recognition as a best-practice model for broadband expansion. The model, which includes extensive broadband mapping, a public-private partnership and grassroots eCommunity leadership teams, has been identified by numerous states as the preferred model for accelerating broadband.

According to Lawrence Spiwak, President of the Phoenix Center for Advanced Legal and Economic Public Policy Studies, "The Connected Nation approach to broadband is perhaps the most important public policy innovation for communications services in many decades. In an environment characterized by constant rhetorical divisiveness, Connected Nation pulls people together to share in their relentless focus on expanding broadband availability and subscription. As this new study shows, there is much to gain from expanding broadband availability and use in this country, and Connected Nation has proven itself up to the task."

To download a copy of the report and additional information regarding the study, visit [www.connectednation.org](http://www.connectednation.org).

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## THE ECONOMIC IMPACT OF STIMULATING BROADBAND NATIONALLY: KEY FINDINGS

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- Kentucky's broadband adoption rate is higher than the national trends due to Connected Nation's first statewide broadband expansion program, ConnectKentucky.
- Adopting a national policy to stimulate the deployment of broadband in underserved areas of the U.S. could have dramatic and far-reaching economic impacts. For instance, just a seven percentage point increase in broadband adoption could result in:
  - **\$92 billion** through an additional 2.4 million jobs per year created
  - **\$662 million** saved per year in reduced healthcare costs
  - **\$6.4 billion** per year in mileage saving from unnecessary driving
  - **\$18 million** in carbon credits associated with 3.2 billion fewer lbs of CO<sub>2</sub> emissions per year in the United States
  - **\$35.2 billion** in value from 3.8 billion more hours saved per year from accessing broadband at home
  - **\$134 billion** per year in total direct economic impact of accelerating broadband across the United States
- If Congress passes legislation (such as S. 1190/H.R. 3627, H.R. 3919, or S. 1492) to empower every state to implement programs modeled after ConnectKentucky and experience an increase in the growth rate of broadband adoption over what should be expected without a broadband focused program, the estimate of direct economic stimulus is more than \$134 billion per year for the nation.
- In 2007, the U.S. House of Representatives voted unanimously to pass such legislation, and the U.S. Senate passed a similar proposal as part of a renewal of the Farm Bill. The Senate and the House should complete negotiations on the Farm Bill, including broadband provisions as outlined in the bills listed above.

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## AFFIRMATIONS

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"The Communications Workers of America has long been pressing for public policies that will allow all Americans to share in today's telecommunications revolution and for our nation to fully utilize the economic engine of the 21st century. Economic growth, quality jobs and the tremendous opportunity for improvement in the personal lives of all Americans depends on substantial improvements in speed, quality and most critically, the build out of true high-speed Internet networks. At the current rates of broadband speed in the United States, the promise of telemedicine, distance learning and civic participation simply isn't possible. And both developed and developing regions – Europe, Korea and parts of southeast Asia, eastern Europe and more – have moved far ahead of us. This economic impact study spotlights not only the positive benefits that will result from the build out of true high-speed broadband networks, but reinforces the critical need for a national broadband policy and the broadband mapping bills that Congress now is considering."

**Larry Cohen, President**  
**Communications Workers of America**

"Connected Nation provides convincing evidence that the benefits of broadband adoption spill over to society as a whole. Moreover, the report rightly concludes that public policies to spur broadband are critical to ensure the best possible broadband future for the United States."

**Dr. Robert D. Atkinson, President**  
**The Information Technology & Innovation Foundation**

"Through its experience in Kentucky, Connected Nation provides an incredibly successful model for stimulating broadband build out and demand that should be adopted nationally. Its comprehensive strategy of assessing broadband availability, identifying and aggregating demand through grassroots county planning teams, and bringing providers and users together through a public private partnership has resulted in an expansion of broadband availability that is significant and measurable. Connected Nation's study identifies the economic benefits that can be expected if such a strategy is adopted nationally. This study should strengthen the growing, bi-partisan call in Washington, DC for a national broadband policy and specific legislation that would enable other states to participate in and benefit from this proven and successful model of economic development.

**Kenneth R. Peres, PhD, President**  
**Alliance for Public Technology**

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## AFFIRMATIONS

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The Connected Nation approach to broadband is perhaps the most important public policy innovation for communications services in many decades. In an environment characterized by constant rhetorical divisiveness, Connected Nation pulls people together to share in their relentless focus on expanding broadband availability and subscription. As this new study shows, there is much to gain from expanding broadband availability and use in this country, and Connected Nation has proven itself up to the task.

**Lawrence Spiwak, President**  
**Phoenix Center for Advanced Legal & Economic Public Policy Studies**

"Connected Nation continues to blaze a trail toward a networked nation that works for everyone. This report demonstrates the powerful economic effects of broadband adoption. More to the point, Connected Nation has proven the tangible benefits of engaging the challenges of 21st Century infrastructure at the community level. The process begun by Connected Nation in Kentucky can and should serve as a model for efforts across the US."

**Charles Kaylor, Principal**  
**Public Sphere Information Group**

"To retain and gain jobs and to promote learning and earning, every city, town and rural community will need the connected power of broadband. Connected Nation's research shows that job generating power of having people connected to broadband. I look forward to learning more from their groundbreaking work as communities learn how, from them, to use broadband for improving these services and promoting economic development and job gains."

**Graham Richard, Former Mayor**  
**Fort Wayne, Indiana**

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## EXECUTIVE SUMMARY

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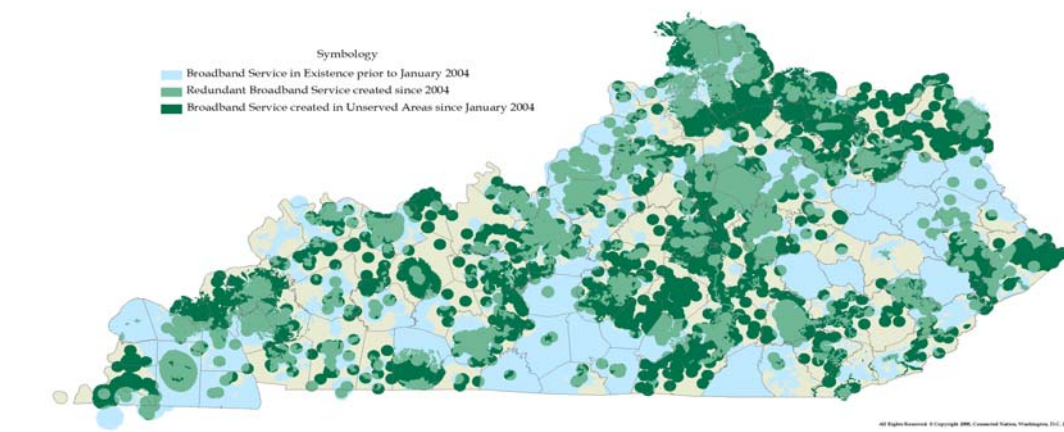
**If Congress passes legislation to empower every state to implement programs modeled after ConnectKentucky and experience an increase in the growth rate of broadband adoption over what should be expected without a broadband focused program, the estimate of direct economic stimulus is more than \$134 billion per year for the nation.**

It has been widely established that broadband networks provide a constructive platform for addressing a variety of public challenges including healthcare, education, homeland security and workforce/economic development.<sup>1</sup> Yet, at the beginning of 2008, many United States residents still cannot access broadband Internet service.

One state, Kentucky, has made measurable strides in expanding broadband networks. The broadband initiative in Kentucky led by ConnectKentucky brings together partners in the public and private sector to foster both the supply of and demand for broadband. The primary goal of ConnectKentucky is to increase the availability of technology by ensuring broadband service is available to each household and business in the state and to measurably improve computer literacy, ownership and overall technological literacy.

In 2004, only 60% of Kentucky households had broadband available for subscription. Three years later, in December 2007, 95% of households could subscribe to broadband, a statewide increase of nearly 60%. The map below identifies the growth of broadband investment from 2004-2007 (Figure 1)<sup>2</sup>. It is the result of a cooperative mapping effort among more than eighty Kentucky broadband providers (Table 1).

**Figure 1: Broadband Service Growth in Kentucky 2004-2007**  
Household Coverage Grew from 60% to 95%



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<sup>1</sup> Robert W. Crandall, Robert E. Litan, and William Lehr, “The Effects of Broadband Deployment on Output and Employment: A Cross-Sectional Analysis Of U.S. Data,” *Issues in Economic Policy: The Brookings Institution*, No. 6, July 2007, p. 1.

<sup>2</sup> ConnectKentucky Broadband Service Growth Map, January 1, 2004 to December 31, 2007.



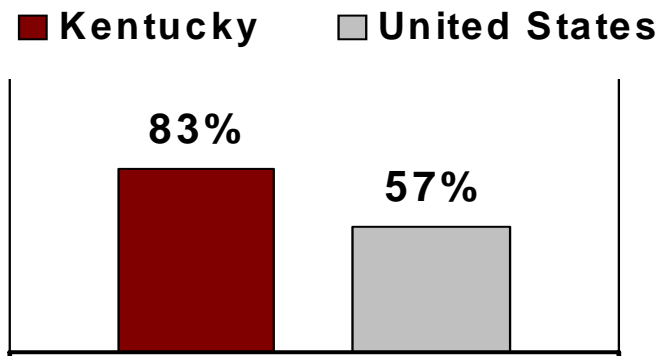
**Table 1: List of 81 Providers Represented on the KY Broadband Service Growth Map**

ACCESS CABLE TELEVISION	HIGHLAND TELEPHONE	PRINCETON ELECTRIC AND
ACCESS KENTUCKY	COOPERATIVE	PLANT BOARD
ARMSTRONG UTILITIES	HOPKINSVILLE ELECTRIC	PRITCHTECH
AT&T	SYSTEM	RIVERSIDE COMMUNICATIONS
BALLARD RURAL TELEPHONE	INSIGHT COMMUNICATIONS	RUSSELLVILLE ELECTIRC
COOPERATIVE	INTERMOUNTAIN CABLE	PLANT BOARD
BARBOURVILLE UTILITY	IRVINE COMMUNITY	SALEM TELEPHONE COMPANY
COMMISSION	TELEVISION	SCS WIRELESS
BARDSTOWN MUNICIPAL	KEN-TENN WIRELESS, LLC	SHELBY WIRELESS
UTILITIES	KVNET	SIT-CO (FORMERLY OHIO
BIG SANDY TV CABLE	KYWIFI	VALLEY WIRELESS)
BLUEONE.NET - PENDLETON	KYWIMAX	SOUTH CENTRAL RURAL
COUNTY	LESLIE COUNTY TELEPHONE	TELEPHONE COOPERATIVE
BOWLING GREEN MUNICIPAL	LEWISPORT TELEPHONE	CORPORATION
UTILITIES	COMPANY	SOUTHEAST TELEPHONE
BRANDENBURG TELEPHONE	LIBERTY COMMUNICATIONS,	SPEEDBEAM
COMPANY	INC	SSINET
BURGIN WIRELESS	LIMESTONE CABLE VISION	SUDDENLINK
CAINPRO COMMUNICATIONS	LOGAN TELEPHONE	TDS
CEBRIDGE CONNECTIONS	COOPERATIVE	THACKER-GRISBY TELEPHONE
CHAPEL COMMUNICATIONS	LYCOM	COMPANY
CINCINNATI BELL TELEPHONE	MAYFIELD ELECTRIC AND	TIME WARNER CABLE
CITY OF BELLEFONTE	WATER SYSTEMS	TV SERVICE & UNITED CABLE
CITY OF RACELAND	MEDIACOM	US DIGITAL ONLINE
COALFIELDS TELEPHONE	MEGA-WI	VORTEX WIRELESS
COMCAST CABLE	MONTICELLO PLANT BOARD	VVDS
DUO COUNTY TELECOM	MOUNTAIN TELEPHONE	WEBCATS NETWORKS
DUO COUNTY TELEPHONE	COOPERATIVE	WEST KENTUCKY NETWORKS
COOPERATIVE CORPORATION	NETPOWER, LLC	WEST KENTUCKY RURAL
FOOTHILLS RURAL TELEPHONE	NEWWAVE COMMUNICATIONS	TELEPHONE COOPERATIVE
COOPERATIVE CORPORATION	NORTH CENTRAL TELEPHONE	CORPORATION
FRANKFORT ELECTRIC & WATER	COOPERATIVE	WILLIAMSTOWN CATV
PLANT BOARD	OHIO COUNTY DIRECT NET	WILLIAMSTOWN UTILITY
GALAXY CABLEVISION	OWENSBORO MUNICIPAL	COMPANY
HARLAN COMMUNITY TV	UTILITIES	WIMAX EXPRESS
HENDERSON MUNICIPAL POWER	PEOPLES RURAL TELEPHONE	WINDSTREAM
& LIGHT COMPANY	COOPERATIVE CORPORATION	WORLDWIDE GAP

This important investment in technology infrastructure did not happen in a vacuum. It was fueled by fast growing demand promoted in large part by ConnectKentucky. *From 2005-2007, broadband adoption (the number of homes subscribing to high-speed broadband service) in Kentucky increased 83%, a rate that exceeded what would naturally be expected when compared to nationwide trends for household broadband adoption.* Clearly something unique has taken place in Kentucky (Figure 2)<sup>3</sup>.

<sup>3</sup> KY growth comes from 2 studies: 2005 University of KY E-Commerce Report - statewide digit dial telephone survey conducted March 2005. N=1,102 +/- 3% at the 95% level of confidence. And 2007 ConnectKentucky Residential Technology Assessment - statewide random digit dial telephone survey

**Figure 2: Broadband Adoption Growth Rates 2005-2007**



ConnectKentucky's success in promoting broadband adoption is the result of a comprehensive, targeted and locally relevant program that was repeated across each Kentucky county. It is a series of well designed and implemented supply and demand promoting programs that can be readily replicated in other states. Connected Nation, the national non-profit of which ConnectKentucky is a subsidiary, is now implementing the same kind of programming in other states.

Using the device of counterfactual analysis, this paper has conservatively quantified the direct impact of ConnectKentucky as the intervening factor in Kentucky. Additionally, the paper extrapolates this impact to other states to quantify the potential national impact of pending federal legislation that would empower states to accelerate broadband through similar public-private partnerships.

To measure the impact of the ConnectKentucky initiative on broadband adoption in Kentucky, this study compares the growth rate of adoption in Kentucky from 2005-2007 to what one would have expected if no ConnectKentucky program had been in place. In other words, what would we expect adoption rates to be in the absence of a coordinated public-private program such as ConnectKentucky. To this end, we compare Kentucky broadband adoption trends since the start of ConnectKentucky's program with national average broadband growth trends during the same period. In the identified time frame, Kentucky had 297,000 more subscribers than expected when compared to national growth rates.<sup>4</sup> For Kentucky, this means 297,000 more subscribers are participating in

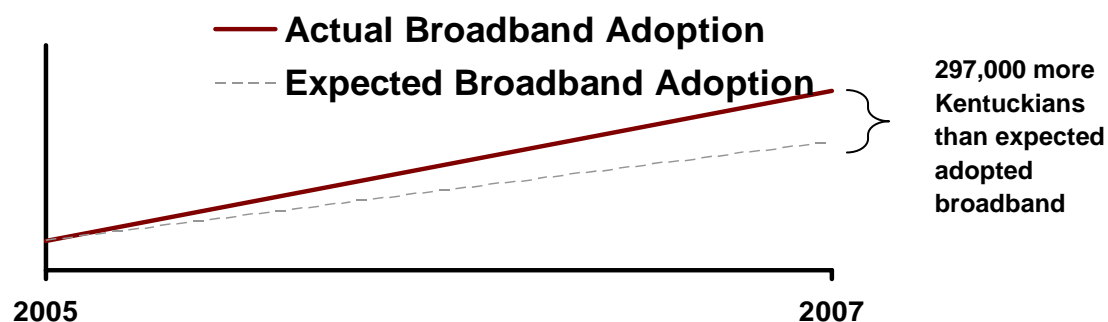
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completed September 2007. N = 10,830 +/- 1.7% at the 95% level of confidence. National growth: "Home Broadband Adoption 2007" by John Horrigan and Aaron Smith, Pew Internet and American Life Project, June 2007

<sup>4</sup> If national broadband adoption rates between 2005 and 2007 were applied to Kentucky's 2005 baseline broadband adoption rate (24%), then Kentucky's expected statewide adoption would be only 37% in 2007. However, Kentucky's broadband adoption percentage is actually 44% in 2007, which is seven percentage points above the expected adoption rate. This additional 7% translates into approximately 297,000 more individuals accessing broadband in the state of Kentucky than expected.

the benefits of broadband today than would have without the ConnectKentucky program (Figure 3)<sup>5</sup>.

**Figure 3: Kentucky's Actual versus Expected Broadband Adoption in 2007**



Many have recognized that broadband adoption represents an important source of gaining an economic advantage. A recent Brookings Institution study developed a formula for gauging the growth in jobs that can be associated with growth in broadband adoption.<sup>6</sup> This study uses the Brookings Institution formula along with direct consumer surveys to estimate the direct economic impacts associated with employment, time saved, direct consumer healthcare savings and economic and environmental impact of fewer miles being driven due to online activity enabled by broadband.

To further understand the urgency of a concerted effort to promote broadband adoption and stimulate infrastructure investment, it is useful to extrapolate economic benefits gained through broadband acceleration onto the nation as a whole. By applying the dynamic equivalents to other state demographics and by assuming a similar higher than expected growth rate in broadband adoption, this study reports that if every state were to develop initiatives similar to ConnectKentucky, the United States could expect to gain:

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<sup>5</sup> KY growth comes from 2 studies: 2005 University of KY E-Commerce Report - statewide digit dial telephone survey conducted March 2005. N=1,102 +/- 3% at the 95% level of confidence. And 2007 ConnectKentucky Residential Technology Assessment - statewide random digit dial telephone survey completed September 2007. N = 10,830 +/- 1.7% at the 95% level of confidence. National growth: "Home Broadband Adoption 2007" by John Horrigan and Aaron Smith, Pew Internet and American Life Project, June 2007

<sup>6</sup> Robert W. Crandall, Robert E. Litan, and William Lehr, "The Effects of Broadband Deployment on Output and Employment: A Cross-Sectional Analysis Of U.S. Data," *Issues in Economic Policy: The Brookings Institution*, No. 6, July 2007.

- **\$92 billion** through an additional 2.4 million jobs per year created
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Given the federal government's current search for constructive forms of economic stimulus, Connected Nation encourages the 110<sup>th</sup> Congress to consider the following bills that directly seek to replicate the ConnectKentucky model nationwide as a relevant means to both short and long term economic stimulus that provides an astounding return on investment.

- S. 1190/H.R. 3627 – the Connect the Nation Act of 2007
- S. 1492 – the Broadband Data Improvement Act
- H.R. 3919 – the Broadband Census of America Act of 2007

Each of these bills in various ways provides legislation that includes:

- Recognition of the critical role of public-private partnerships in broadband expansion
- Federal enabling of state/local response to broadband deployment and demand aggregation
- Recognition of the indispensable role non-profits play in program implementation

Time is of the essence. Farm Bill negotiations should include agreement of these elements. The United States can ill afford the passing of another year without policies that will stimulate broadband growth, particularly in previously underserved or overlooked areas. Much consensus building has occurred around broadband policy needs during this Congress. The time for action is now.

**Table 2: A State-by-State Summary of the Annual Economic Impact Associated  
with Accelerating Broadband for Each State**

	Total Annual Economic Impact	Annual Net Job Growth from the Increase in Broadband	Direct Annual Income Growth from the Increase in Broadband	Average Annual Healthcare Costs Saved	Average Annual Mileage Costs Saved	Average Annual Hours Saved	Annual Value of Hours Saved	Average Annual lbs of CO <sub>2</sub> Emissions Cut	Value of Carbon Offsets
Alabama	\$1,692,307,789	33,451	\$1,118,595,872	\$10,187,810	\$99,216,165	57,715,987	\$464,036,535	50,255,886	\$271,408
Alaska	\$317,188,552	4,846	\$212,849,167	\$1,484,307	\$14,018,776	8,408,897	\$88,797,954	7,100,920	\$38,349
Arizona	\$2,498,704,035	46,358	\$1,680,954,424	\$13,659,679	\$129,327,410	77,384,824	\$674,408,744	65,508,111	\$353,778
Arkansas	\$963,684,222	20,577	\$635,196,771	\$6,226,667	\$60,352,819	35,275,319	\$261,742,869	30,570,465	\$165,097
California	\$17,287,110,398	262,042	\$11,577,026,715	\$80,761,066	\$768,277,259	457,527,657	\$4,858,943,717	389,154,873	\$2,101,641
Colorado	\$2,351,248,032	39,665	\$1,644,109,297	\$10,529,720	\$101,888,351	59,652,980	\$594,441,946	51,609,426	\$278,718
Connecticut	\$1,938,746,950	29,765	\$1,368,285,351	\$7,763,882	\$76,465,884	43,983,951	\$486,022,659	38,732,204	\$209,174
Delaware	\$452,660,929	7,796	\$324,919,691	\$1,890,627	\$18,478,024	10,710,782	\$107,322,040	9,359,659	\$50,547
Florida	\$7,531,595,950	143,405	\$5,136,752,665	\$40,072,871	\$399,029,270	227,020,858	\$1,954,649,591	202,119,981	\$1,091,554
Georgia	\$3,907,660,865	71,059	\$2,639,837,894	\$20,743,080	\$197,143,135	117,513,714	\$1,049,397,466	99,858,756	\$539,290
Hawaii	\$578,001,026	10,284	\$397,274,880	\$2,827,646	\$28,011,744	16,132,486	\$149,790,130	14,988,767	\$76,627
Idaho	\$565,942,345	10,859	\$378,002,347	\$3,248,525	\$30,661,907	18,403,549	\$153,945,689	15,531,152	\$83,876
Illinois	\$6,207,888,316	105,622	\$4,321,003,997	\$28,425,487	\$273,919,566	161,036,091	\$1,583,789,952	138,748,261	\$749,314
Indiana	\$2,679,847,808	52,863	\$1,860,248,442	\$13,985,762	\$134,940,477	79,232,151	\$670,303,994	68,351,293	\$369,133
Iowa	\$1,237,290,273	26,064	\$866,632,289	\$6,605,940	\$64,670,465	37,423,974	\$299,204,671	32,757,480	\$176,908
Kansas	\$1,154,893,120	22,828	\$798,081,721	\$6,123,002	\$58,974,133	34,688,036	\$291,552,939	29,872,121	\$161,325
Kentucky	\$1,587,239,467	31,699	\$1,061,603,244	\$9,317,330	\$91,153,941	52,784,546	\$424,915,597	46,172,134	\$249,354
Louisiana	\$1,556,816,993	31,313	\$1,030,199,954	\$9,498,299	\$91,233,861	53,809,773	\$425,635,307	46,212,615	\$249,572
Maine	\$544,607,277	10,577	\$371,878,460	\$2,927,562	\$29,575,200	16,585,225	\$140,145,152	14,988,767	\$80,904
Maryland	\$2,813,857,230	43,922	\$1,933,873,816	\$12,440,005	\$121,232,549	70,475,128	\$745,979,225	61,407,827	\$331,635
Massachusetts	\$3,840,751,425	58,411	\$2,765,167,106	\$14,259,724	\$141,613,044	80,784,197	\$919,324,165	71,731,143	\$387,386
Michigan	\$4,637,508,875	76,200	\$3,141,722,166	\$22,363,953	\$217,268,265	126,696,281	\$1,255,560,149	110,052,723	\$594,343
Minnesota	\$2,791,482,532	48,691	\$2,021,172,957	\$11,446,205	\$111,405,012	64,845,051	\$647,153,606	56,429,893	\$304,751
Mississippi	\$905,743,973	18,723	\$570,305,184	\$6,447,452	\$61,452,087	36,526,113	\$267,371,146	31,127,277	\$168,104
Missouri	\$2,501,367,723	48,592	\$1,733,262,586	\$12,942,827	\$126,066,630	73,323,711	\$628,750,822	63,856,431	\$344,858
Montana	\$337,218,046	7,198	\$225,220,226	\$2,092,557	\$20,700,888	11,854,754	\$89,147,748	10,485,604	\$56,628
Nebraska	\$783,129,301	16,280	\$558,411,615	\$3,917,222	\$37,725,489	22,191,847	\$182,971,776	19,109,062	\$103,199
Nevada	\$1,175,028,256	23,482	\$845,359,452	\$5,528,117	\$52,939,525	31,317,891	\$271,056,344	26,815,416	\$144,817
New Hampshire	\$634,062,329	11,374	\$446,419,295	\$2,912,766	\$28,960,278	16,501,406	\$155,690,768	14,669,227	\$79,222
New Jersey	\$4,636,703,229	71,109	\$3,231,890,665	\$19,326,718	\$188,794,006	109,489,738	\$1,196,175,390	95,629,679	\$516,451
New Mexico	\$694,119,894	13,184	\$447,177,912	\$4,329,844	\$41,293,689	24,529,436	\$200,405,489	20,916,460	\$112,960
New York	\$9,909,345,962	147,884	\$6,776,023,161	\$42,767,217	\$420,637,031	242,284,874	\$2,668,767,889	213,064,943	\$1,150,663
North Carolina	\$3,626,061,051	69,432	\$2,466,214,037	\$19,619,004	\$190,523,446	111,145,595	\$949,183,383	96,505,690	\$521,182
North Dakota	\$264,354,171	5,755	\$186,703,927	\$1,408,578	\$13,960,441	7,979,877	\$62,243,037	7,071,371	\$38,189
Ohio	\$5,165,789,104	96,312	\$3,598,197,715	\$25,426,175	\$247,968,322	144,044,384	\$1,293,518,569	125,603,198	\$678,323
Oklahoma	\$1,270,219,076	25,603	\$833,901,696	\$7,928,700	\$76,474,057	44,917,679	\$351,705,426	38,736,344	\$209,197
Oregon	\$1,653,094,131	29,383	\$1,133,296,659	\$8,197,950	\$80,851,438	46,443,033	\$430,526,912	40,953,615	\$221,171
Pennsylvania	\$5,618,124,596	103,916	\$3,905,168,316	\$27,558,567	\$274,060,290	156,124,817	\$1,410,587,724	138,819,542	\$749,699
Rhode Island	\$517,684,416	8,896	\$360,983,164	\$2,364,979	\$23,573,532	13,398,078	\$130,698,255	11,940,682	\$64,486
South Carolina	\$1,628,562,600	32,629	\$1,089,806,446	\$9,572,467	\$93,461,551	54,229,946	\$435,466,470	47,341,006	\$255,666
South Dakota	\$295,051,946	6,718	\$204,642,266	\$1,732,113	\$16,753,192	9,812,771	\$71,878,545	8,485,981	\$45,829
Tennessee	\$2,450,739,704	49,142	\$1,682,608,846	\$13,377,207	\$130,689,201	75,784,562	\$623,706,946	66,197,898	\$357,503
Texas	\$9,424,006,380	173,117	\$6,303,206,537	\$52,074,637	\$486,029,518	295,013,274	\$2,581,366,143	246,188,147	\$1,329,546
Utah	\$1,066,414,382	20,728	\$736,673,777	\$5,648,921	\$50,494,153	32,002,271	\$273,459,402	25,576,764	\$138,128
Vermont	\$275,359,624	5,270	\$191,553,395	\$1,382,086	\$13,953,557	7,829,796	\$68,432,416	7,067,884	\$38,170
Virginia	\$3,764,632,826	63,344	\$2,625,619,577	\$16,930,580	\$165,834,683	95,915,137	\$955,794,341	84,000,111	\$453,645
Washington	\$3,056,439,915	48,365	\$2,075,358,306	\$14,168,025	\$138,603,982	80,264,707	\$827,930,448	70,206,965	\$379,155
West Virginia	\$616,017,781	12,690	\$398,961,244	\$4,028,290	\$40,504,254	22,821,071	\$172,413,192	20,516,588	\$110,800
Wisconsin	\$2,613,219,462	50,748	\$1,863,975,895	\$12,308,818	\$120,871,181	69,731,928	\$615,732,922	61,224,784	\$330,646
Wyoming	\$215,933,328	4,383	\$150,308,706	\$1,140,841	\$11,197,254	6,463,094	\$53,255,896	5,671,736	\$30,630
<b>Total</b>	<b>\$134,235,457,615</b>	<b>2,352,552</b>	<b>\$91,927,439,829</b>	<b>\$ 661,941,807</b>	<b>\$6,413,230,933</b>	<b>3,750,033,246</b>	<b>\$35,215,301,497</b>	<b>3,248,488,796</b>	<b>\$17,543,549</b>

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## INTRODUCTION

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It is widely understood that increased adoption of broadband technology speeds the flow of information and sparks innovation. According to the Brookings Institution, “High-speed Internet access has developed rapidly in the last decade and is increasingly viewed as essential infrastructure for our global information economy.”<sup>7</sup> However, at the beginning of 2008, many United States residents still cannot access broadband Internet service, especially in America’s most rural areas.

One state, Kentucky, has significantly accelerated broadband availability and use. In fact, 95% of Kentuckians can now access broadband in their homes, up from just 60% in 2004.<sup>8</sup> The broadband initiative in Kentucky has been led by ConnectKentucky, an innovative non-profit that brings together partners from the public and private sector to foster the supply and demand of broadband and related technology.

The ConnectKentucky model is rooted in a community-driven technology planning process that creates demand for broadband and information technology services, which in turn drives the investment that extends the supply of those services. The point of contact between supply and demand is within communities themselves. The ConnectKentucky model attempts to foster a sustainable, grassroots coalition of community leaders representing education, healthcare, businesses, government, libraries, agriculture, tourism and community-based organizations. These “eCommunity Leadership Teams” utilize ConnectKentucky’s community-level consumer research and other forms of market intelligence to develop customized technology programs, targeted awareness campaigns and community-oriented applications to increase adoption and generates demand for services. Meanwhile, best practices are shared across the state to encourage smart and cost effective investments. In Kentucky, this “human network” of local volunteers numbers greater than 4,000 local citizens, working together to make a better use of technology in their community.

ConnectKentucky pairs this local technology planning with a collaborative engagement among all broadband providers, which yields a statewide, household-level mapping of broadband “gaps” and customized plans to fill those gaps with highly used services. Mapping these broadband gaps allows for an in-depth market analysis of unserved areas, including household densities, potential collocation resources such as water and cell towers, terrain analysis and proposed infrastructure such as water lines, sewer projects and future roads. *The combination of local knowledge and resources with an effective broadband map allows broadband providers and communities to accurately*

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<sup>7</sup> Robert W. Crandall, Robert E. Litan, and William Lehr, “The Effects of Broadband Deployment on Output and Employment: A Cross-Sectional Analysis Of U.S. Data,” *Issues in Economic Policy: The Brookings Institution*, No. 6, July 2007, p. 1.

<sup>8</sup> ConnectKentucky Broadband Service Availability Map, quarterly update, December 31, 2007.

*mesh technology deployment with potential users of application development, all while ideally increasing community awareness and adoption.*

ConnectKentucky has served as an important pilot model whose success and lessons learned are informing policy at the federal and state levels. Currently, there exists legislation in Washington, DC and in multiple states that aims to enable similar programs promoting demand and supply of broadband services. This report attempts to contribute to this discussion. First, this report evaluates broadband trends in Kentucky and compares them with national averages. This comparison helps to quantify the pent up potential for growth in the ITC sector that programs such as ConnectKentucky help to promote. Second, this study attempts to estimate the direct availability economic impact for Kentuckians of the increased growth in broadband adoption. It then extrapolates from these results to estimate the potential economic impact to the entire nation of a national program that similarly accelerates broadband.

This report follows a natural sequence of questions regarding the ConnectKentucky program from 2005-2007 and the implications for state national policy development:

- To what degree has broadband adoption increased in Kentucky?
- How has No Child Left Offline® affected broadband adoption?
- What are the direct economic benefits of this broadband acceleration effort?
- What would be the impact if current legislation passed to empower similar efforts in the rest of the United States to ensure access to affordable broadband?
- What government policies would foster supply and demand of broadband to underserved areas of the United States?



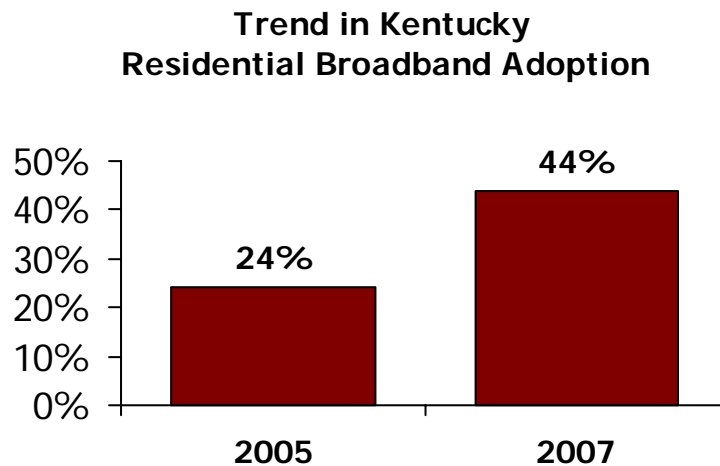
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## **BROADBAND ADOPTION IN KENTUCKY GREW WHILE GRASSROOTS GROUPS CREATED DEMAND STATEWIDE**

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In March, 2005, only 24% of Kentucky residents subscribed to broadband service. By September 2007, that proportion had increased to 44% (Figure 4)<sup>9</sup>. This represents an increase of 83% in this 28 month period.

**Figure 4: Residential Broadband Adoption Rates in Kentucky**



In this time frame, ConnectKentucky implemented a statewide program that aimed to increase both the supply of and the demand for broadband. In each of Kentucky's 120 counties, eCommunity Leadership Teams were formed to accomplish the following:

- Create and aggregate demand for broadband
- Identify locally relevant applications
- Foster cooperation across both private and public sectors in order to address the local community's needs that are appropriately addressed through technology and broadband in particular
- Create local awareness of the benefits of broadband
- Work with providers of broadband to create a business case for extension of broadband to unserved areas

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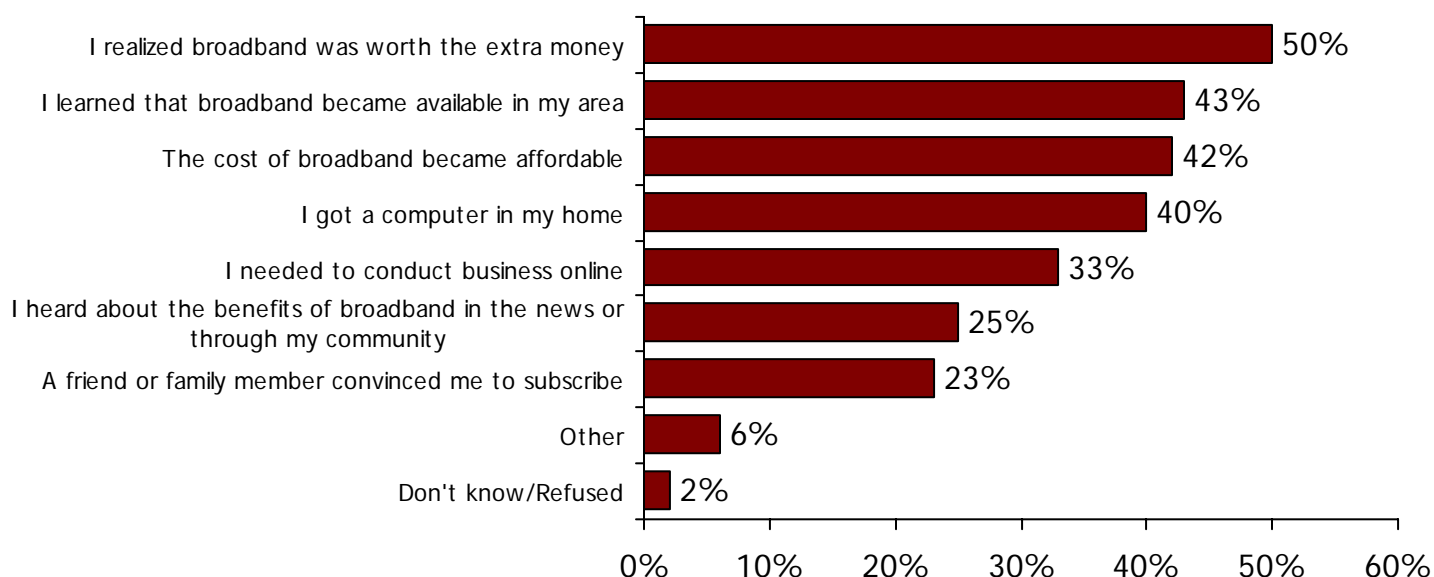
<sup>9</sup> 2005 University of Kentucky E-Commerce Report – statewide random digit dial telephone survey conducted March 2005; n = 1,102; +/-3.0% at the 95% level of confidence. 2007 ConnectKentucky Residential Technology Assessment – statewide random digit dial telephone survey completed September 2007; n = 10,830; +/-1.7% at the 95% level of confidence.



Constituted by 4,000 plus local volunteers, these ConnectKentucky teams have been successful in their mission to create awareness and drive demand. Extensive direct consumer surveys have also been conducted during the 2005-2007 time frame. Not only did demand for broadband increase, but awareness of its availability and recognition of its value were very important factors identified by those households who chose to subscribe. *Note in the data below that availability of broadband and realization of its value are the two most often cited reasons for deciding to subscribe (Figure 5)<sup>10</sup>.*

**Figure 5: Reasons for Broadband Adoption**

**Which of the following contributed to your decision to subscribe to broadband?**



<sup>10</sup> 2007 ConnectKentucky Residential Technology Assessment: “Which of the following contributed to your decision to subscribe to broadband?” n=3,776 Kentucky residents with broadband service at home.

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## NO CHILD LEFT OFFLINE® PROGRAM ACCELERATES ADOPTION INCREASES IN KENTUCKY COMMUNITIES

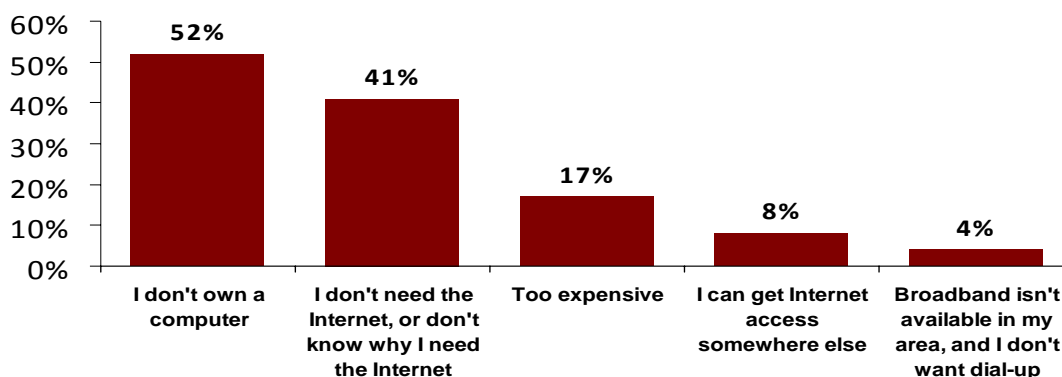
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ConnectKentucky's local demand creating planning groups (eCommunity Leadership Teams) have been at work in every Kentucky community. This pervasive technology planning network created the opportunity for program extensions that went even further to address broadband subscription and computer literacy.

One such program extension is No Child Left Offline® (NCLO). No Child Left Offline is a response to consumer research conducted by ConnectKentucky among Kentucky households. That research indicates on a regular basis "lack of a computer" as the primary barrier associated with Internet adoption (Figure 6). According to a 2004 Department of Commerce Report, approximately 56% of Americans who do not access the Internet indicated that the lack of a computer at home was the primary reason for not being online.<sup>11</sup> *ConnectKentucky research continues to support this finding – while the number of Internet users has risen in Kentucky over the last three years, the lack of a computer at home continues to be the primary barrier to Internet adoption (Figure 6)*<sup>12</sup>.

To address the computer ownership barrier in Kentucky, ConnectKentucky's No Child Left Offline program brings together public and private partners to provide computers for economically disadvantaged children. The program has not only increased computer ownership, but it has been tracked with remarkable increases in broadband adoption.

**Figure 6: Barriers to Internet Adoption in Kentucky**



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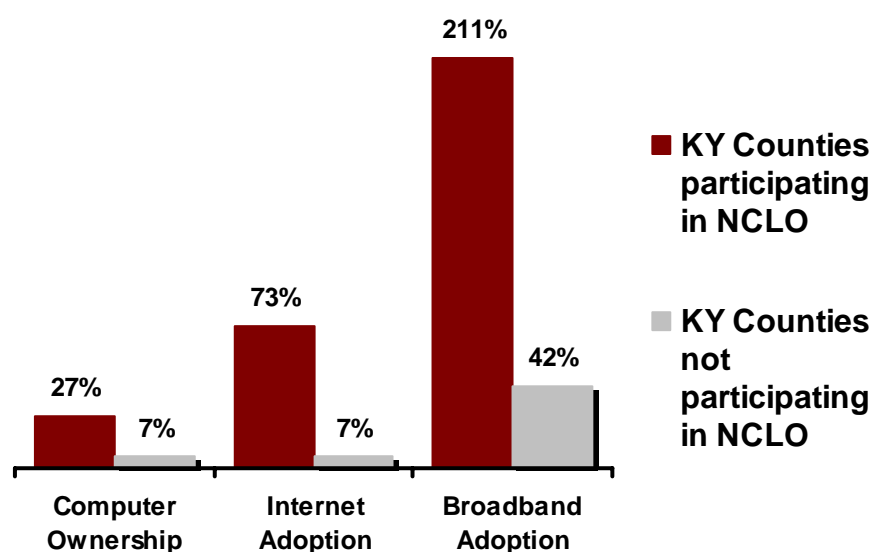
<sup>11</sup> National Telecommunications and Information Administration, United States Department of Commerce, A Nation Online: Entering the Broadband Age, September 2004.

<sup>12</sup> 2007 CK Residential Technology Assessment, October 2007. (N = 4,309 KY residents who do not have Internet service at home).

No Child Left Offline has had a dramatic impact on the lives of Kentucky families. According to the ConnectKentucky 2005 and 2007 Residential Technology Assessments:

- In the last two years, computer ownership among low-income families in No Child Left Offline counties grew nearly four times faster than these families in other counties.<sup>13</sup>
- During the same two-year period, Internet adoption among low-income families in No Child Left Offline counties grew more than ten times faster relative to these families in other areas of the state.<sup>14</sup>
- Broadband adoption among low-income families grew five times faster in counties that received computers through No Child Left Offline. In the last two years, home broadband adoption among low-income families has grown by over 200% in these participating counties (Figure 7)<sup>15</sup>.

**Figure 7: Home Technology Adoption Among Low-Income Families**



<sup>13</sup> Counties participating in No Child Left Offline include the Kentucky counties of Johnson, Clay, Wolfe, McCreary, Owsley, Carter, Lawrence and Morgan. Low-income is defined as annual household income below \$25,000.

<sup>14</sup> Ibid.

<sup>15</sup> Ibid.

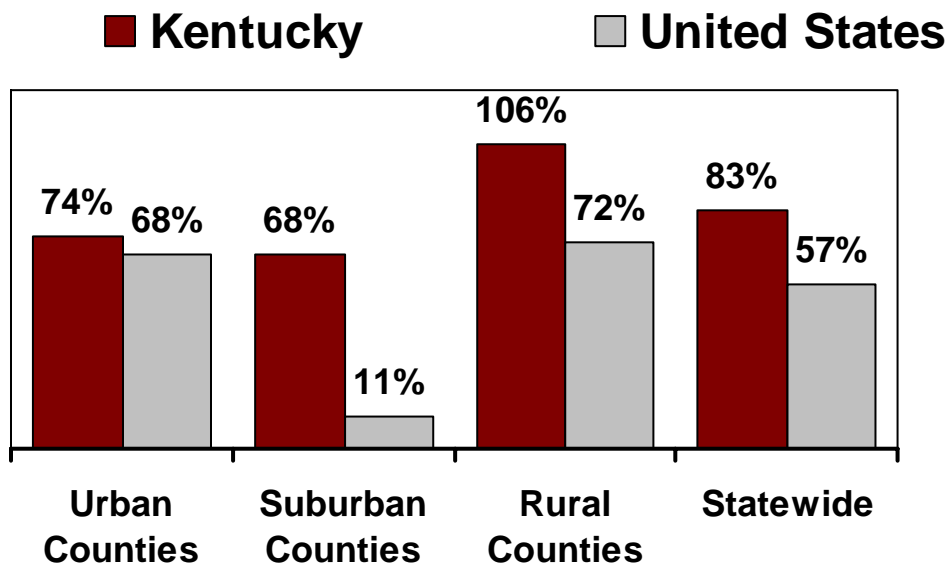
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## KENTUCKY SIGNIFICANTLY OUTPACES NATIONAL AVERAGES FOR BROADBAND ADOPTION

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One way to illustrate ConnectKentucky's impact on broadband adoption is to compare Kentucky's growth rates from 2005-2007 to national growth rates during this same period. As shown in Figure 8<sup>16</sup>, national broadband adoption growth rates were much smaller than Kentucky growth rates in broadband from 2005-2007.<sup>17</sup> For example, the statewide broadband adoption rate in Kentucky grew 83% from 2005 to 2007, while the national broadband adoption rate grew only 57%. Kentucky's broadband adoption grew 26 percentage points more than the national average.

**Figure 8: Broadband Adoption Growth Rates in Kentucky and United States in 2005 - 2007**



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<sup>16</sup> United States adoption rate reported from John B. Horrigan and Aaron Smith, Pew Internet and American Life Project, HOME BROADBAND ADOPTION 2007, June 2007.  
[http://www.pewinternet.org/pdfs/PIP\\_Broadband%202007.pdf](http://www.pewinternet.org/pdfs/PIP_Broadband%202007.pdf)  
Kentucky adoption rate reported from the 2005 University of Kentucky E-Commerce Report and 2007 ConnectKentucky Residential Technology Assessment.

<sup>17</sup> Ibid.

If we look at the rural broadband adoption in Kentucky versus the rest of the United States, it is clear that something significant happened in Kentucky from 2005-2007. Kentucky's growth in rural broadband is even more striking considering that Kentucky ranks 48<sup>th</sup> in educational attainment<sup>18</sup> and 47<sup>th</sup> in median income<sup>19</sup> in the nation - two indicators that have been shown to significantly affect broadband adoption.<sup>20</sup> Indeed, a 2006 GAO report showed that households with high incomes were 39% more likely to adopt broadband than lower-income households, and those with a college-educated head of household were 12% more likely to purchase broadband than households headed by someone who did not graduate from college.<sup>21</sup>

The much larger growth rates in KY household broadband adoption versus national growth (especially in rural areas) as well as Kentucky's lagging levels of education and income – indicate that it is conservative to use the 7% figure. Instead of using the net difference between Kentucky adoption growth and national adoption growth, the study applies a counterfactual analysis to derive the seven percentage point direct ConnectKentucky impact on adoption. Applying the growth rate of the nation to the starting point in the KY time series demonstrates that had Kentucky performed similarly to the rest of the country in terms of broadband adoption growth, the resulting level of household adoption would have been seven percentage points less than what actually occurred. The higher than expected adoption levels that occurred in Kentucky despite the above mentioned negative contributing indicators is attributed to the ConnectKentucky initiative. In other words, what would we expect adoption rates to be without the ConnectKentucky initiative?

*If the national growth rate between 2005 and 2007 were applied to the 2005 Kentucky baseline (24%), then Kentucky's expected statewide adoption in 2007 would be 37%. However, Kentucky's broadband adoption percentage is actually 44% in 2007, which*

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<sup>18</sup> American Community Survey, 2003, "Percent of People 25 Years and Over Who Have Completed High School (Including Equivalency), Population 25 years and over (State level) Table" United States Census Bureau.

<sup>19</sup> American Community Survey, 2003, "Median Household Income," United States Census Bureau.

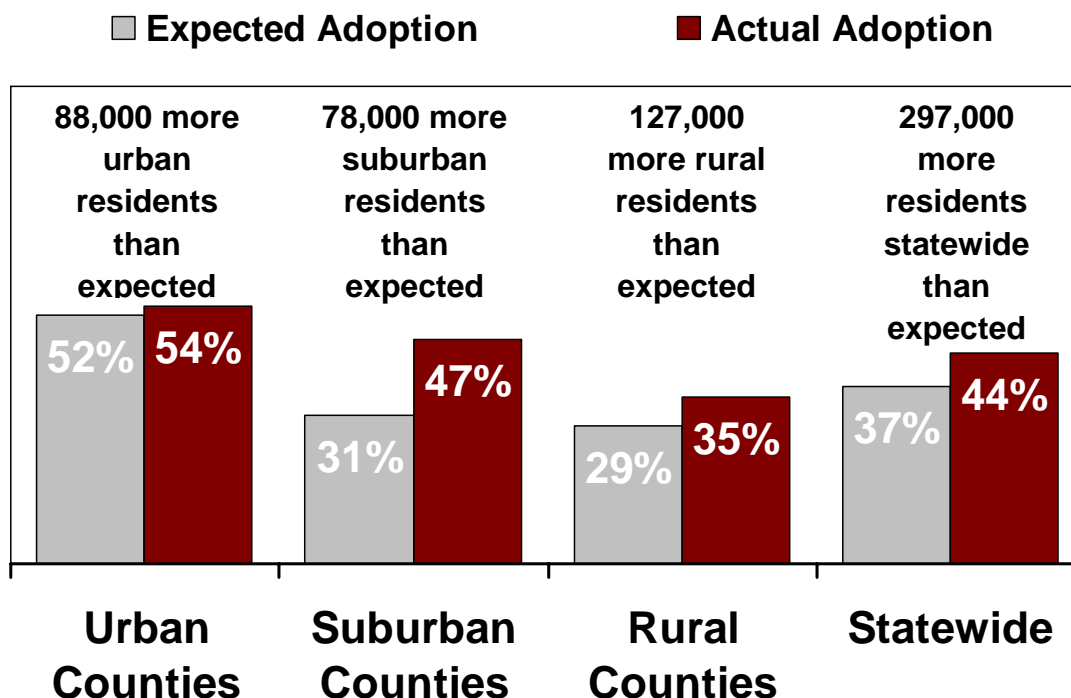
<sup>20</sup> John Horrigan and Aaron Smith, "Home Broadband Adoption 2007," Pew Internet and American Life Project, HOME BROADBAND ADOPTION, June 2007, p.4 and George S. Ford, Thomas M. Koutsky and Lawrence J. Spiwak, *The Demographic and Economic Drivers of Broadband Adoption in the United States*, PHOENIX CENTER POLICY PAPER, No 31 (November 2007).

<sup>21</sup> United States Government Accountability Office, Broadband Deployment Is Extensive throughout the United States, but It Is Difficult to Assess the Extent of Deployment Gaps in Rural Areas, May 2006, p. 29.

represents 297,000 more subscribers above the expected adoption rate.<sup>22 23</sup> The intervening factor has been ConnectKentucky. (Figure 9)<sup>24</sup>.

**Figure 9: The Difference in Kentucky Broadband Adoption Rate From Its Expected Adoption Rate Given National Trends from 2005 to 2007**

**2007 Actual vs. Expected KY Broadband Adoption**



<sup>22</sup> 2007 ConnectKentucky Residential Technology Assessment.

<sup>23</sup> United States Population Estimates, 2006, United States Census Bureau.

<sup>24</sup> Expected Kentucky adoption rates derived from John B. Horrigan and Aaron Smith, Pew Internet and American Life Project, HOME BROADBAND ADOPTION 2007, June 2007.

[http://www.pewinternet.org/pdfs/PIP\\_Broadband%202007.pdf](http://www.pewinternet.org/pdfs/PIP_Broadband%202007.pdf)

Actual Kentucky adoption rates reported from the 2005 University of Kentucky E-Commerce Report and 2007 ConnectKentucky Residential Technology Assessment. Sum of urban, suburban and rural figures will not equal total state figure as a result of rounding.

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## THE ECONOMIC IMPACTS OF INCREASED BROADBAND AVAILABILITY AND ADOPTION IN KENTUCKY

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By conservative measurement, Kentucky had 297,000 new broadband subscribers above and beyond the number of subscribers one would anticipate if Kentucky had followed the national trends for growth in broadband subscription. From 2005-2007, the one question that remains is how the online activity of an extra 297,000 broadband subscribers in Kentucky translates into a specific economic impact. In this section, we examine the impact of an additional 297,000 Kentuckians accessing broadband on the following five economic variables: 1) employment 2) healthcare cost savings 3) mileage costs saved 4) environmental pollution and 5) time saved.

These five basic variables were chosen as the most uniformly realized benefits of broadband subscription and represent a conservative appraisal of the estimated impact. There are additional benefits associated with broadband adoption such as improved education, a more technologically literate workforce and more efficient government services.

**Employment:** There have been various studies on the impact of broadband growth on employment. While they have had varying conclusions, all indicate a positive correlation between broadband and employment. A recent study by economists at the Brookings Institution concluded that “non-farm private employment and employment in several industries is positively associated with broadband use. More specifically, for every one percentage point increase in broadband penetration in a state, employment is projected to increase by 0.2 to 0.3 percent per year.”<sup>25</sup> By using this study that is widely recognized for its relevance and conservative coefficient of estimation and by applying it to the data from Kentucky, the seven percentage point growth in broadband adoption in Kentucky over the expected has resulted in an additional 63,417 jobs created or saved in Kentucky between 2005 and 2007.<sup>26</sup> *The average annual economic value of these jobs can be estimated at \$1.06 billion in direct wages.*<sup>27</sup>

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<sup>25</sup> Robert W. Crandall, Robert E. Litan, and William Lehr, “The Effects of Broadband Deployment on Output and Employment: A Cross-Sectional Analysis Of U.S. Data,” *Issues in Economic Policy: The Brookings Institution*, No. 6, July 2007, p. 2.

<sup>26</sup> For a two-year time frame, the Crandall et al. paper (pages 9-10) generated .593 as the coefficient for a two-year time span from the regression results from the effect of broadband on employment during 2003-2005. Therefore, we used .593 as the coefficient for the two-year effect from 2005-2007. According to the United States Bureau of Labor Statistics, Kentucky’s employment was 1.51 million in 2005.

<sup>27</sup> Using Kentucky’s average annual wage of \$33,490 in 2006, as reported by the United States Bureau of Labor Statistics ([www.bls.gov](http://www.bls.gov)).

**Healthcare Cost Savings:** According to the 2007 ConnectKentucky Residential Technology Assessment, 72% of home broadband users who use the Internet for healthcare purposes report that access to online health information has empowered them to become healthier.<sup>28</sup> Of the residents who have become healthier, 63% report that doing so has saved them money, with an average self-reported savings of \$217 per person.<sup>29</sup>

To conservatively estimate the impact of the boost in broadband adoption resulting from the ConnectKentucky initiatives, only the *actual* healthcare costs savings among broadband subscribers are analyzed – and this analysis is limited to broadband adoption above the expected rate. *An estimated 35% of all broadband users report saving an average of \$217 as a direct result of becoming healthier through obtaining healthcare information online. This translates into a \$9.4 million dollar annual self-reported healthcare cost savings for the additional 297,000 broadband users above the expected in Kentucky.* This does not account for savings to the state in Medicaid or other indirect health savings.

The ConnectKentucky survey also found that 47% of Kentuckians who use broadband to access healthcare information agree that by doing so, they have prevented potentially unnecessary trips to doctors, hospitals, emergency rooms or other healthcare professionals. Each patient's visit to a physician, emergency room or other medical facility costs money. *Among Kentucky broadband users, 37% report that online access to healthcare information has prevented an average of 4.2 unnecessary trips to receive medical care.*<sup>30</sup> *This equals more than 462,000 medical visits avoided among the 297,000 additional broadband users as a result of ConnectKentucky efforts.*

**Mileage Costs Saved:** The ability to conduct transactions online also means that Kentuckians with broadband spend less time in their cars.<sup>31</sup> Instant information and broadband-based access to relevant government services means not having to stand in line at shops and at town hall. In the 2007 ConnectKentucky residential survey, 66% of broadband users report driving an average of 102 fewer miles per month because of

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<sup>28</sup> 2007 ConnectKentucky Residential Technology Assessment: "Q15D. Obtaining healthcare information online has empowered me to be healthier?" n= 191 respondents with broadband service at home who obtain healthcare information online.

<sup>29</sup> 2007 ConnectKentucky Residential Technology Assessment: "Q16D1. About how much money would you estimate you have saved by becoming healthier in this way?" n= 191 respondents with broadband service at home who obtain healthcare information online.

<sup>30</sup> 2007 ConnectKentucky Residential Technology Assessment: "Q16E. About how many trips to a doctor, hospital or medical center have you saved by finding information online?" n= 191 respondents with broadband service at home who obtain healthcare information online.

<sup>31</sup> 2007 ConnectKentucky Residential Technology Assessment: "Q15C. I need to drive less often or fewer miles because of the things I do online" n=243 respondents with broadband service at home.



their online activity.<sup>32</sup> This yields a total annual savings of more than 1.2 billion vehicle miles. Of these savings, approximately 190 million miles per year can be attributed to larger than expected growth in broadband adoption. *Using the United States General Services Administration reimbursement rate for driving of \$0.485 per mile, it can be said that the ConnectKentucky initiative has yielded an annual savings of \$92.1 million in consumer driving costs.*

**Environmental Pollution:** Broadband adoption creates other positive externalities with respect to transportation, such as reduced gasoline consumption and reduced emissions. The estimated cost savings associated with a reduction in miles driven does not account for the significant environmental cost savings that result from fewer cars on the road. According to the World Resources Institute, the average 2005 fuel fleet economy was 21 miles per gallon.<sup>33</sup> According to the Center for Environmental Economic Development, 1 gallon of gas equates to 5.159 lbs. of carbon.<sup>34</sup> Given these figures and the savings of 190 million vehicle miles attributed to broadband adoption above expected, it can be estimated that ConnectKentucky efforts generated an annual reduction of 46.7 million pounds of carbon emissions. *In addition to the positive environmental impact and using the standard measurements for CO<sub>2</sub> emissions credits, the annual economic impact of 46.7 million pounds of carbon emissions can be estimated at \$252,200.*<sup>35</sup>

**Time Saved:** According to the 2007 ConnectKentucky statewide survey, 75% of Internet users agree that conducting online transactions has saved them time.<sup>36</sup> Broadband users are significantly more likely than dial-up users to agree that doing things online saves them time. Broadband users report saving nearly 40% more time than dial-up users. The average broadband user reports saving 15 hours a month by conducting transactions online.<sup>37</sup> The time saved by the additional 297,000 individuals accessing broadband in Kentucky above the expected amount translates into approximately 53.4 million hours saved each year. Assuming that one hour saved is equal in value to at

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<sup>32</sup> 2007 ConnectKentucky Residential Technology Assessment: “Q16C. About how many miles of driving per month do you save by having Internet service at home?” n=157 respondents with broadband service at home who agree that Internet service at home reduces the amount they need to drive.

<sup>33</sup> <http://embarq.wri.org/documents/Schipper-VehicEfficiency.pdf>.

<sup>34</sup> <http://ceedweb.org/PDFs/CO2Worksheet.pdf>.

<sup>35</sup> Using the average cost of carbon emission offsets charged by the 21 major U.S. carbon offset providers, as reported by Carbon Catalog ([www.carboncatalog.org](http://www.carboncatalog.org)) on 1/28/2008.

<sup>36</sup> 2007 ConnectKentucky Residential Technology Assessment.

<sup>37</sup> 2007 ConnectKentucky Residential Technology Assessment: “Q15B. Doing things online saves me time?” n=243 respondents with broadband service at home, and 113 respondents with dial-up service at home.

least one half hour of wage earned, these saved hours can account for an estimated \$429.8 million in value.<sup>38</sup>

**Summary of ConnectKentucky Impact:** The direct economic impacts of the additional 297,000 individuals accessing broadband in Kentucky can be quantified directly as follows:

- \$1.06 billion in annual direct wages from jobs created or saved in Kentucky
- \$9.4 million in annual self-reported healthcare costs savings
- \$92.1 million per year in mileage savings from broadband preventing unnecessary driving
- 46.7 million lbs of CO<sub>2</sub> emissions reduction per year in Kentucky (\$250,000 emission credits)
- \$429.8 million value in the 53.4 million hours saved per year from accessing broadband at home

Taken together, the combined estimate for the direct economic impact in Kentucky associated with a higher than expected statewide gain in broadband adoption is \$1.59 billion annually.

**Looking forward, if Kentucky continues to invest in an effective statewide broadband adoption strategy through ConnectKentucky, the state can expect to realize<sup>39</sup>:**

- **\$1.06 billion** in annual direct wages from jobs created or saved in Kentucky
- **\$9.3 million** in annual self-reported healthcare costs savings
- **\$91.1 million** per year in mileage savings from broadband preventing unnecessary driving
- **46.1 million** lbs of CO<sub>2</sub> emissions reduction per year in Kentucky (\$249,000 emission credits)
- **\$424.9 million** value in the 52.8 millions hours saved per year from accessing broadband at home

**The total estimated impact of continuing the ConnectKentucky program in Kentucky is \$1.59 billion annually.**

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<sup>38</sup> The estimates regarding the value of time saved is based on the assumption that broadband subscribers can use their extra free time to work more hours, contribute to communities through volunteer time or simply enjoy additional leisure time which has been shown to enhance productivity while on the clock.

<sup>39</sup> See Table 3. Kentucky impact figures for future years compared to the Kentucky 2005-2007 impact period will be similar, but not exact, as a result of using consistent methodology with varying employment data from year to year. Additionally, forward projections are rounded down from the exact 7.08 percentage point growth to a seven percentage growth point across states.

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## ESTIMATING THE ECONOMIC IMPACT OF A CONNECTED NATION

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Despite the widely recognized benefits associated with broadband in the United States,<sup>40</sup> there are still many areas in the United States where broadband is simply unavailable. Accentuating the challenge is an overall lack of dependable data regarding exactly where broadband is and is not available.<sup>41</sup>

A 2006 GAO report concluded that “when the availability of broadband to households, as well as demographic characteristics, are taken into account, rural households no longer appear less likely than urban households to subscribe to broadband. That is, the difference in the subscribership to broadband among urban and rural households appears to be related to the difference in availability of the service across these areas, and not to a lower disposition of rural households to purchase the service.”<sup>42</sup> Therefore, it appears that with the universal availability of broadband, the current 31% rural broadband adoption rate would eventually become much closer to the urban broadband adoption rate of 52%.

If the rest of the states in the U.S. were empowered to develop initiatives similar to accelerate broadband, one would expect to see increased adoption in suburban and urban areas, but especially in rural areas, as rural areas are most significantly affected by broadband availability increases. In fact, if every state could accelerate their broadband adoption by seven percentage points above the expected, like Kentucky did with the ConnectKentucky initiative, one would expect the following impact for the United States as a whole (for individual state results see Table 3):

- **\$92 billion** through an additional 2.4 million jobs per year created or retained<sup>43</sup>

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<sup>40</sup> Robert W. Crandall, Robert E. Litan, and William Lehr, “The Effects of Broadband Deployment on Output and Employment: A Cross-Sectional Analysis Of U.S. Data,” *Issues in Economic Policy: The Brookings Institution*, No. 6, July 2007.

<sup>41</sup> According to a report by John Horrigan, Associate Director of Research for the Pew Internet and American Life Project, “When the Pew Internet Project asked dial-up users in 2004 whether broadband was available where they live, 15% said it was not available, a figure that stood at 27% for rural Americans. Those numbers might be lower in 2007, but there is a dearth of reliable nationwide information on where broadband is unavailable,” U.S. Lags behind Why It Will Be Hard to Close the Broadband Divide by John B. Horrigan, page 3-4. [http://www.pewinternet.org/pdfs/Broadband\\_Commentary.pdf](http://www.pewinternet.org/pdfs/Broadband_Commentary.pdf). Friday, 10 August 2007.

<sup>42</sup> General Accounting Office, *Broadband Deployment Is Extensive Throughout the United States, but It Is Difficult to Assess the Extent of Deployment Gaps in Rural Areas*, May 2006, p. 30.

<sup>43</sup> Job growth is calculated using 2006 private, non-farm employment from the Bureau of Labor Statistics in accordance with Crandall et al. methodology, using a coefficient of .593 to calculate job growth over a two year period. Job growth is estimated over a two year period assuming a seven

- **\$662 million** saved per year in reduced healthcare costs
- **\$6.4 billion** per year in mileage savings from preventing unnecessary driving
- **\$18 million** in carbon credits associated with 3.2 billion fewer lbs of CO<sub>2</sub> emissions per year in the United States
- **\$35.2 billion** in value from 3.8 billion more hours saved per year from accessing broadband at home
- **\$134 billion** per year in total direct economic impact for the United States

**If every state were to implement programs modeled after ConnectKentucky and experience a modest increase in the growth rate of broadband adoption over what should be expected without a broadband focused program, the estimate of direct economic benefit is more than \$134 billion per year (Table 3).**

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percentage point increase in broadband adoption above expected growth. Direct income growth is estimated using May 2006 wage estimates for each state from the Bureau of Labor Statistics. All figures are annualized.

**Table 3: A State-by-State Summary of the Annual Economic Impact Associated with Accelerating Broadband for Each State**

	Total Annual Economic Impact	Annual Net Job Growth from the Increase in Broadband	Direct Annual Income Growth from the Increase in Broadband	Average Annual Healthcare Costs Saved	Average Annual Mileage Costs Saved	Average Annual Hours Saved	Annual Value of Hours Saved	Average Annual lbs of CO <sub>2</sub> Emissions Cut	Value of Carbon Offsets
Alabama	\$1,692,307,789	33,451	\$1,118,595,872	\$10,187,810	\$99,216,165	57,715,987	\$464,036,535	50,255,886	\$271,408
Alaska	\$317,188,552	4,846	\$212,849,167	\$1,484,307	\$14,018,776	8,408,897	\$88,797,954	7,100,920	\$38,349
Arizona	\$2,498,704,035	46,358	\$1,680,954,424	\$13,659,679	\$129,327,410	77,384,824	\$674,408,744	65,508,111	\$353,778
Arkansas	\$963,684,222	20,577	\$635,196,771	\$6,226,667	\$60,352,819	35,275,319	\$261,742,869	30,570,465	\$165,097
California	\$17,287,110,398	262,042	\$11,577,026,715	\$80,761,066	\$768,277,259	457,527,657	\$4,858,943,717	389,154,873	\$2,101,641
Colorado	\$2,351,248,032	39,665	\$1,644,109,297	\$10,529,720	\$101,888,351	59,652,980	\$594,441,946	51,609,426	\$278,718
Connecticut	\$1,938,746,950	29,765	\$1,368,285,351	\$7,763,882	\$76,465,884	43,983,951	\$486,022,659	38,732,204	\$209,174
Delaware	\$452,660,929	7,796	\$324,919,691	\$1,890,627	\$18,478,024	10,710,782	\$107,322,040	9,359,659	\$50,547
Florida	\$7,531,595,950	143,405	\$5,136,752,665	\$40,072,871	\$399,029,270	227,020,858	\$1,954,649,591	202,119,981	\$1,091,554
Georgia	\$3,907,660,865	71,059	\$2,639,837,894	\$20,743,080	\$197,143,135	117,513,714	\$1,049,397,466	99,858,756	\$539,290
Hawaii	\$578,001,026	10,284	\$371,874,880	\$2,847,646	\$28,011,744	16,132,486	\$149,790,130	14,188,767	\$76,627
Idaho	\$565,942,345	10,859	\$378,002,347	\$3,248,525	\$30,661,907	18,403,549	\$153,945,689	15,531,152	\$83,876
Illinois	\$6,207,888,316	105,622	\$4,321,003,997	\$28,425,487	\$273,919,566	161,036,091	\$1,583,789,952	138,748,261	\$749,314
Indiana	\$2,679,847,808	52,863	\$1,860,248,442	\$13,985,762	\$134,940,477	79,232,151	\$670,303,994	68,351,293	\$369,133
Iowa	\$1,237,290,273	26,064	\$866,632,289	\$6,605,940	\$64,670,465	37,423,974	\$299,204,671	32,757,480	\$176,908
Kansas	\$1,154,893,120	22,828	\$798,081,721	\$6,123,002	\$58,974,133	34,688,036	\$291,552,939	29,872,121	\$161,325
Kentucky	\$1,587,239,467	31,699	\$1,061,603,244	\$9,317,330	\$91,153,941	52,784,546	\$424,915,597	46,172,134	\$249,354
Louisiana	\$1,556,816,993	31,313	\$1,030,199,954	\$9,498,299	\$91,233,861	53,809,773	\$425,635,307	46,212,615	\$249,572
Maine	\$544,607,277	10,577	\$371,878,460	\$2,927,562	\$29,575,200	16,585,225	\$140,145,152	14,980,703	\$80,904
Maryland	\$2,813,857,230	43,922	\$1,933,873,816	\$12,440,005	\$121,232,549	70,475,128	\$745,979,225	61,407,827	\$331,635
Massachusetts	\$3,840,751,425	58,411	\$2,765,167,106	\$14,259,724	\$141,613,044	80,784,197	\$919,324,165	71,731,143	\$387,386
Michigan	\$4,637,508,875	76,200	\$3,141,722,166	\$22,363,953	\$217,268,265	126,696,281	\$1,255,560,149	110,052,723	\$594,343
Minnesota	\$2,791,482,532	48,691	\$2,021,172,957	\$11,446,205	\$111,405,012	64,845,051	\$647,153,606	56,429,893	\$304,751
Mississippi	\$905,743,973	18,723	\$570,305,184	\$6,447,452	\$61,452,087	36,526,113	\$267,371,146	31,127,277	\$168,104
Missouri	\$2,501,367,723	48,592	\$1,733,262,586	\$12,942,827	\$126,066,630	73,323,711	\$628,750,822	63,856,431	\$344,858
Montana	\$337,218,046	7,198	\$225,220,226	\$2,092,557	\$20,700,888	11,854,754	\$89,147,748	10,485,604	\$56,628
Nebraska	\$783,129,301	16,280	\$558,411,615	\$3,917,222	\$37,725,489	22,191,847	\$182,971,776	19,109,062	\$103,199
Nevada	\$1,175,028,256	23,482	\$845,359,452	\$5,528,117	\$52,939,525	31,317,891	\$271,056,344	26,815,416	\$144,817
New Hampshire	\$634,062,329	11,374	\$446,419,295	\$2,912,766	\$28,960,278	16,501,406	\$155,690,768	14,669,227	\$79,222
New Jersey	\$4,636,703,229	71,109	\$3,231,890,665	\$19,326,718	\$188,794,006	109,489,738	\$1,196,175,390	95,629,679	\$516,451
New Mexico	\$694,119,894	13,184	\$447,977,912	\$4,329,844	\$41,293,689	24,529,436	\$200,405,489	20,916,460	\$112,960
New York	\$9,909,345,962	147,884	\$6,776,023,161	\$42,767,217	\$420,637,031	242,284,874	\$2,668,767,889	213,064,943	\$1,150,663
North Carolina	\$3,626,061,051	69,432	\$2,466,214,037	\$19,619,004	\$190,523,446	111,145,595	\$949,183,383	96,505,690	\$521,182
North Dakota	\$264,354,171	5,755	\$186,703,927	\$1,408,578	\$13,960,441	7,979,877	\$62,243,037	7,071,371	\$38,189
Ohio	\$5,165,789,104	96,312	\$3,598,197,715	\$25,426,175	\$247,968,322	144,044,384	\$1,293,518,569	125,603,198	\$678,323
Oklahoma	\$1,270,219,076	25,603	\$833,901,696	\$7,928,700	\$76,474,057	44,917,679	\$351,705,426	38,736,344	\$209,197
Oregon	\$1,653,094,131	29,383	\$1,133,296,659	\$8,197,950	\$80,851,438	46,443,033	\$430,526,912	40,953,615	\$221,171
Pennsylvania	\$5,618,124,596	103,916	\$3,905,168,316	\$27,558,567	\$274,060,290	156,124,817	\$1,410,587,724	138,819,542	\$749,699
Rhode Island	\$517,684,416	8,896	\$360,983,164	\$2,364,979	\$23,573,532	13,398,078	\$130,698,255	11,940,682	\$64,486
South Carolina	\$1,628,562,600	32,629	\$1,089,806,446	\$9,572,467	\$93,461,551	54,229,946	\$435,466,470	47,341,006	\$255,666
South Dakota	\$295,051,946	6,718	\$204,642,266	\$1,732,113	\$16,753,192	9,812,771	\$71,878,545	8,485,981	\$45,829
Tennessee	\$2,450,739,704	49,142	\$1,682,608,846	\$13,377,207	\$130,689,201	75,784,562	\$623,706,946	66,197,898	\$357,503
Texas	\$9,424,006,380	173,117	\$6,303,206,537	\$52,074,637	\$486,029,518	295,013,274	\$2,581,366,143	246,188,147	\$1,329,546
Utah	\$1,066,414,382	20,728	\$736,673,777	\$5,648,921	\$50,494,153	32,002,271	\$273,459,402	25,576,764	\$138,128
Vermont	\$275,359,624	5,270	\$191,553,395	\$1,382,086	\$13,953,557	7,829,796	\$68,432,416	7,067,884	\$38,170
Virginia	\$3,764,632,826	63,344	\$2,625,619,577	\$16,930,580	\$165,834,683	95,915,137	\$955,794,341	84,000,111	\$453,645
Washington	\$3,056,439,915	48,365	\$2,075,358,306	\$14,168,025	\$138,603,982	80,264,707	\$827,930,448	70,206,965	\$379,155
West Virginia	\$616,017,781	12,690	\$398,961,244	\$4,028,290	\$40,504,254	22,821,071	\$172,413,192	20,516,588	\$110,800
Wisconsin	\$2,613,219,462	50,748	\$1,863,975,895	\$12,308,818	\$120,871,181	69,731,928	\$615,732,922	61,224,784	\$330,646
Wyoming	\$215,933,328	4,383	\$150,308,706	\$1,140,841	\$11,197,254	6,463,094	\$53,255,896	5,671,736	\$30,630
<b>Total</b>	<b>\$134,235,457,615</b>	<b>2,352,552</b>	<b>\$91,927,439,829</b>	<b>\$ 661,941,807</b>	<b>\$6,413,230,933</b>	<b>3,750,033,246</b>	<b>\$35,215,301,497</b>	<b>3,248,488,796</b>	<b>\$17,543,549</b>

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## POLICY RECOMMENDATIONS

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Many have recognized the need for a national broadband policy. The case for such a policy has been eloquently captured in Dr. Robert Atkinson's recent "Framing a National Broadband Policy." In that report, Dr. Atkinson suggests that if left to market forces alone and with no intervening factor, broadband is not likely to be adopted at a rate that is universally pleasing or constructive. It stands to reason that national policy-makers would make broadband expanding policy a priority as a platform for developing solutions in a number of critical areas: healthcare, education, environmental degradation and even homeland security.

As federal policy attempts to provide solutions to the need for a nationwide ubiquitous broadband, the data from the Kentucky experience and the assessment of Connected Nation analysts conclude that the most constructive national solution for broadband expansion is to enable state governments to implement demand creating and supply enhancing programming. Given the cultural, structural, regulatory and topographical variables that influence how broadband can expand, a state is the largest subsystem that can be identified in which to enact effective and cost efficient solutions. Supporting this assumption is once again the data from the ConnectKentucky program. From 2005 to 2007, the time frame under consideration for this study, more than \$740 million in private capital was invested in Kentucky telecommunications infrastructure. The public investment in the program implementation and research that encouraged private telecommunications investment was approximately \$7 million dollars. The household availability of broadband in Kentucky went from 60% to 95% during that time.

Based on Connected Nation's experience in Kentucky and after launching similar initiatives in other states, Connected Nation advocates for passage and enactment of legislation that includes:

- Recognition of the critical role of public-private partnerships in broadband expansion
- Federal enabling of state/local response to broadband deployment and demand aggregation
- Recognition of the indispensable role non-profits play in program implementation

Connected Nation has supported the following bills in the 110<sup>th</sup> Congress that directly seek to replicate and help export the ConnectKentucky model nationwide:

- S. 1190/H.R. 3627 – the Connect the Nation Act of 2007
- S. 1492 – the Broadband Data Improvement Act
- H.R. 3919 – the Broadband Census of America Act of 2007

**Connected Nation is encouraged that each of these broadly supported efforts would effectively enable statewide broadband initiatives that can accelerate broadband growth. The stated level of funding authorization among the four currently viable bills ranges from \$40 million per year (S. 1190 or S. 1492) to H.R. 3919's \$145 million for FY2010 (with \$70 million and \$120 million authorized in the two preceding fiscal years). Relative to the expected annual impact of \$134 billion, the return on investment related to the legislation provides a compelling case for passage.**

Time is of the essence. Farm Bill negotiations should include agreement of these elements. The United States can ill afford the passing of another year without policies that will stimulate broadband growth, particularly in previously underserved or overlooked areas. Much consensus building has occurred around broadband policy needs during this Congress. The time for action is now.



**Enabling Technology. Empowering People.**

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