Broadband Mapping Initiative

House Select Committee on
High Speed Internet in Rural Areas
December 18, 2008

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CONNECTED NATION℠

Our Mission

Connected Nation is a national non-profit 501(c)(3) organization that facilitates market-based strategies for 1) expanding broadband availability and 2) increasing broadband adoption rates across the United States through public-private partnerships.

We do these things because…

We believe states can realize a significant economic impact by accelerating broadband deployment into rural areas and by increasing broadband adoption in all areas, rural and urban.

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Our Work

Connected Nation facilitates three comprehensive, statewide broadband expansion initiatives:

CONNECTKENTUCKY℠

CONNECTED Tennessee
THE TRAIL TO INNOVATION℠

CONNECT OHIO℠

We have also produced (or are in the process of producing) broadband availability maps for the states of West Virginia, South Carolina, and Minnesota

Our Relationships with Broadband Providers

The initiatives we facilitate are, in every sense of the phrase, public-private partnerships – bringing state government and the private sector together around a common table to work collaboratively on broadband expansion.

We believe that broadband providers are part of the solution, not part of the problem.

Our goal is to help providers build their businesses, while creating a climate that makes it possible for them to extend service to unserved areas.

ConnectKentucky's Accomplishments Since 2004

- **96% of Kentucky households have access to Broadband (up from just 60% in four years)**
- **546,000 new households that have received broadband access since 2004**
- **Over $850 million in private capital invested in Kentucky's telecommunications infrastructure**
- **100% growth rate in home broadband adoption**
- **24% growth rate in home computer ownership – six times the national average (4%)**

The Four Key Components of the Connected Nation Model

- **Street-Level Broadband Infrastructure Mapping**
- **Market Intelligence through Survey Research**
- **Demand Creation and Planning at the Grassroots Level**
- **Computers for Underprivileged Households**

The Connect North Carolina Broadband Mapping Initiative:

Provider Participation is Critical

- **The purpose of the Connect North Carolina Broadband Mapping Initiative is to complement the work of the e-NC Authority by creating the state's first accurate street-level picture of where broadband service exists and doesn't exist across the state.**
- **The value of such a map lies not only in understanding the extent of broadband availability in North Carolina, but it will ultimately allow for future discussions and efforts to focus on those areas that are truly unserved.**
- **It is critical that all broadband providers—Cable, DSL, Fixed Wireless, Mobile (Cellular) Wireless, and Municipal Providers—participate in the mapping process so that the map is as accurate as it possibly can be.**

The Connect North Carolina Broadband Mapping Initiative:

Protecting Provider Data

- **Because Connect North Carolina will operate fully outside of state government, we can enter into non-disclosure agreements (NDAs) with each broadband provider to legally protect confidential and proprietary information.**
- **We have spent years building trust with providers of all shapes and sizes in other states, and it is our hope that we can build a mutually beneficial relationship with each and every company that provides service in North Carolina—from large to small.**
- **Once NDAs are in place, the second step consists of working with each provider to develop the most effective and responsible method for collecting that company's broadband coverage data in a way that is least burdensome but yields highly accurate results at the street level.**

Data Collection Methodology for Cable and DSL Providers

We have worked with cable and DSL providers in others states to develop various methods to represent broadband availability:

1. **If a cable or DSL company has already mapped its broadband availability in GIS format at the street level, Connected Nation can integrate these maps into the statewide broadband map.**

2. **Connected Nation can provide a company with electronic street/road maps for each North Carolina county. That company can then mark up those maps (either electronically or on physically on paper) noting the extent to which each street or road is served. When returned to Connected Nation, that data will be digitized into GIS format for each company's approval.**

Data Collection Methodology for Cable and DSL Providers

- continued -

3. **Connected Nation has the ability to geo-code addresses for the homes that are passed by broadband enabled systems. Connected Nation can also utilize the latitude and longitude coordinates of those addresses if that data is more convenient to format. Connected Nation will then create a coverage map for each company's approval in accordance with the data provided.**
4. **Connected Nation can develop broadband availability maps according to household density requirements for broadband deployment as they are provisioned in local franchise agreements, as long as the company has met those franchise requirements.**
5. **Connected Nation can also map the exact location of each DSL central office and remote terminal location and then create 2.5 mile (13,000 ft) radial buffers to represent the broadband availability that each DSLAM provides.**

Data Collection Methodology for Wireless Providers

We have worked with fixed and mobile (cellular) wireless providers in others states to develop various methods to represent wireless broadband availability:

1. **If a company has already mapped its broadband availability in GIS format based on topography and signal penetration, Connected Nation can integrate those maps into the statewide broadband map.**

2. **Longitude and latitude coordinates for each wireless tower location can be obtained from 1) the FCC, 2) on site by our wireless engineers, or 3) by the provider itself. A wireless propagation study will then be conducted based on the capability of the equipment located on each tower.**

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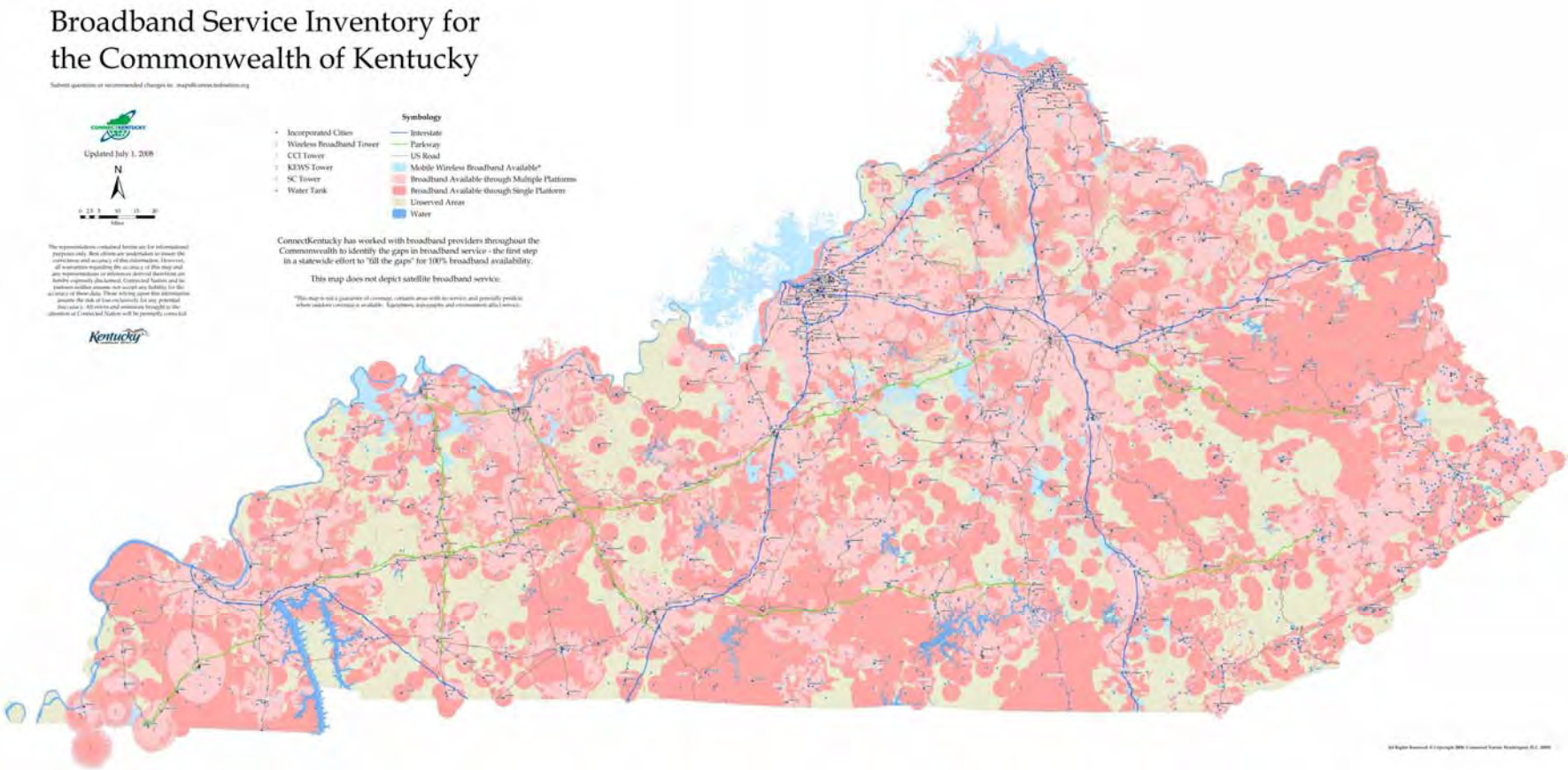
Broadband Availability Maps



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Broadband Availability Maps

CONNECTED Tennessee
THE TRAIL TO INNOVATION℠

Broadband Service Inventory for the State of Tennessee

Submit questions or recommended changes to: maps@connectednation.org

Updated September 30, 2008

N

0 5 10 20 30 40
Miles

This map does not depict satellite broadband service.

*In these areas, there is a strong likelihood for broadband availability; however, technology limitations in select areas may limit service to some homes.

**This map is not a guarantee of coverage, contains areas with no service, and generally predicts where outdoor coverage is available. Equipment, topography and environment affect service.

With the support of Governor Bredesen, the Department of Economic and Community Development, the Office for Information Resources, and the Tennessee Broadband Task Force, Connected Tennessee has worked with broadband providers throughout the State to identify the gaps in broadband service - the first step in a statewide effort to "fill the gaps" for 100% broadband availability.

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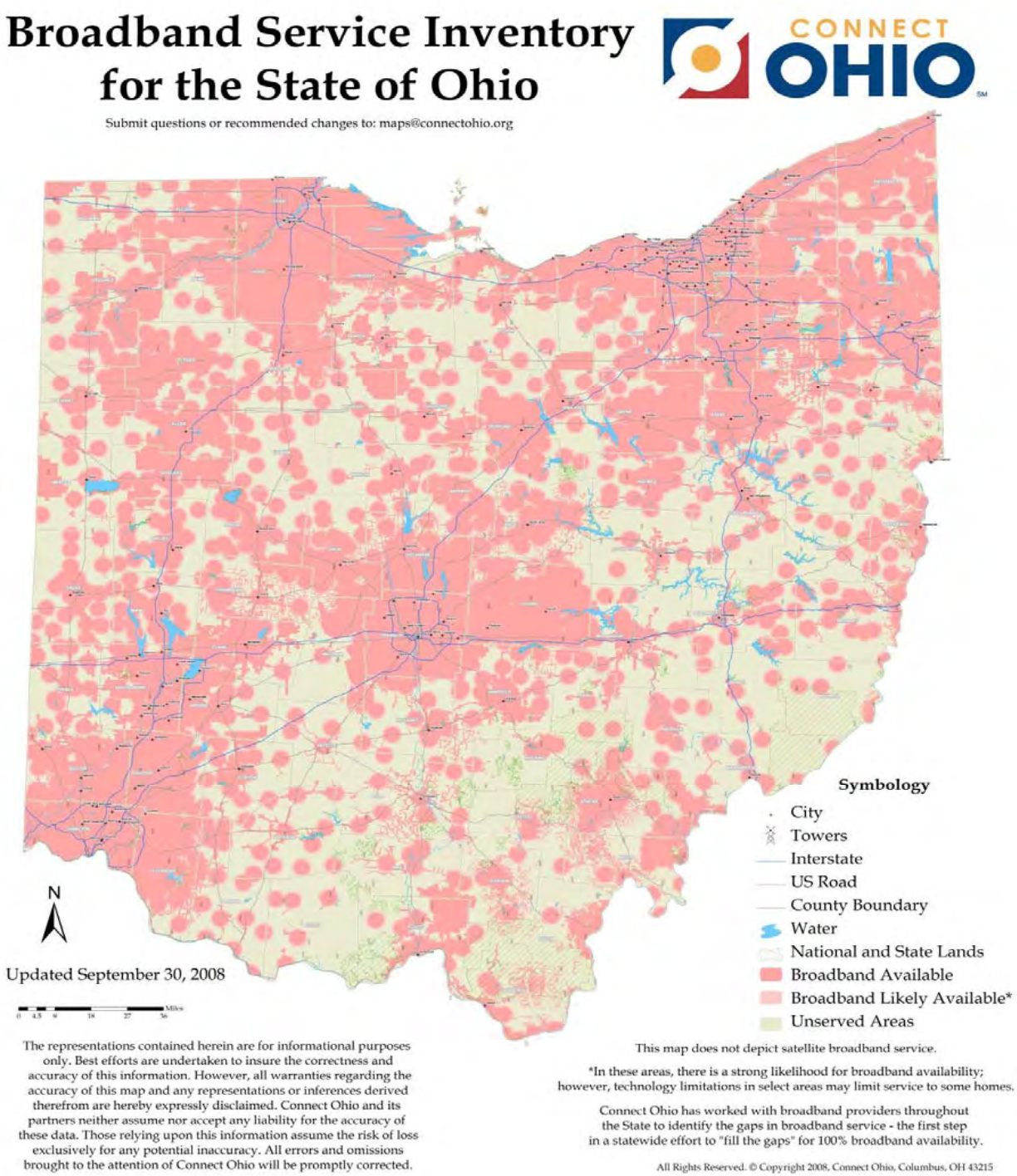
Symbology

- City
- Interstate
- US Road
- County Boundary
- National and State Lands
- Water
- Broadband Available
- Broadband Likely Available*
- Mobile Wireless Broadband Available**
- Unserved Areas



Broadband Availability Maps

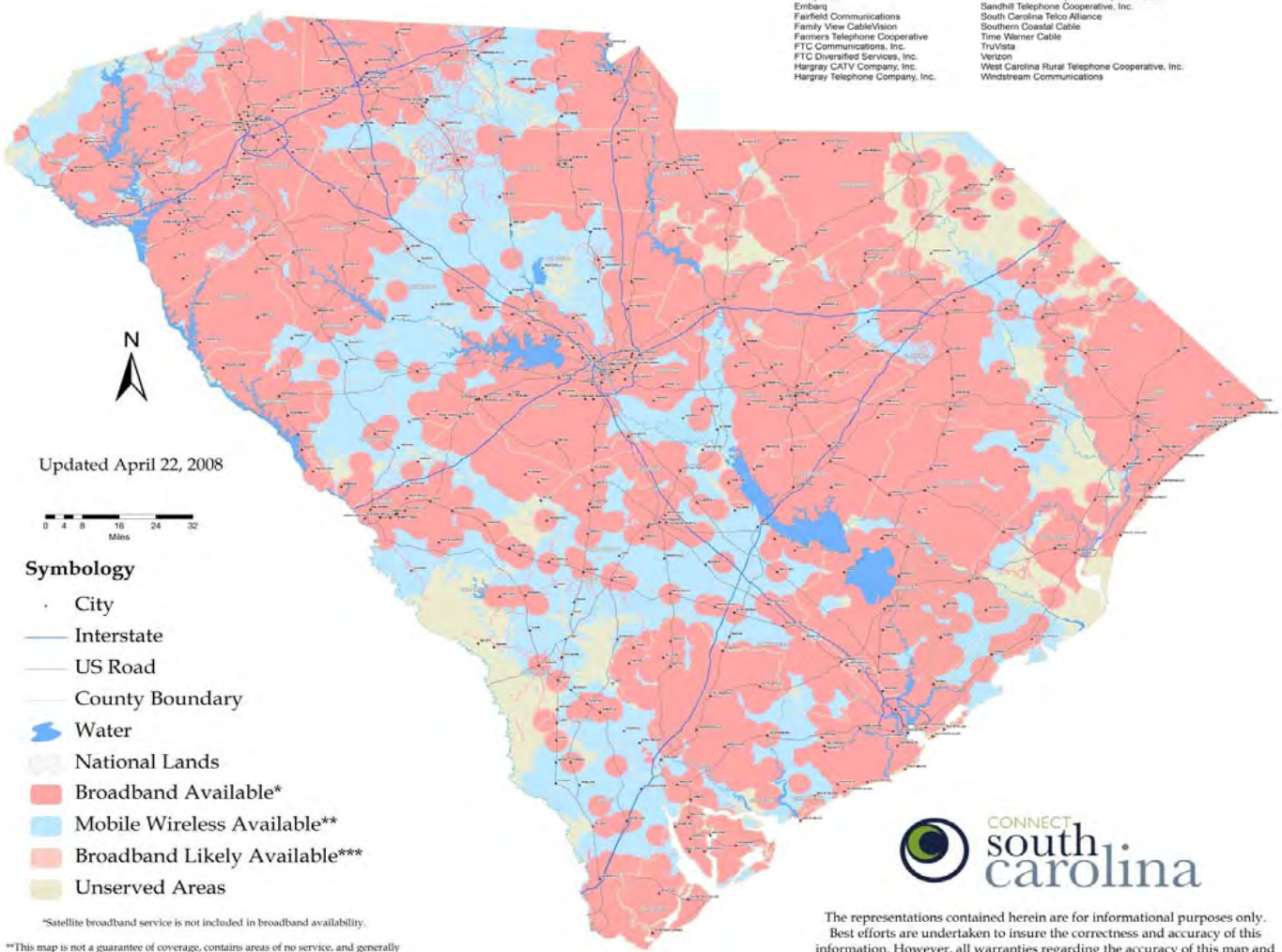
www.connectednation.org

Broadband Service Inventory for the State of South Carolina

Submit questions or recommended changes to: maps@connectednation.org
A digital copy of this map can be obtained at: http://connectednation.com/state_programs/south_carolina.php

36 Providers Are Represented on This Map Including:

AT&T
ACSinc.NET
Aerolina Wireless Networks
Atlantic Broadband
Berkeley Cable TV
Bluffton Telephone Company
Charter Communications
Chesnee Telephone Company
Comcast Cable
Comporium
Embarq
Fairfield Communications
Family View CableVision
Farmers Telephone Cooperative
FTC Communications, Inc.
FTC Diversified Services, Inc.
Hargray CATV Company, Inc.
Hargray Telephone Company, Inc.
Home Telephone Company
Horry Telephone Cooperative, Inc.
HTC Communications, LLC
MainStreet Wireless
Northland Cable
Palmetto Rural Telephone Cooperative, Inc.
PBT Telecom
Pee Dee Online
Personally Complete
Piedmont Rural Telephone Cooperative, Inc.
Sandhill Telephone Cooperative, Inc.
South Carolina Telco Alliance
Southern Coastal Cable
Time Warner Cable
TruVista
Verizon
West Carolina Rural Telephone Cooperative, Inc.
Windstream Communications



*Satellite broadband service is not included in broadband availability.

**This map is not a guarantee of coverage, contains areas of no service, and generally predicts where outdoor coverage is available. Equipment, topography, and environment affect service.

***In these areas, there is a strong likelihood for broadband availability; however, technology limitations in select areas may limit service to some homes.

Connected Nation has worked with broadband providers throughout the State to identify the gaps in broadband service - the first step in a statewide effort to "fill the gaps" for 100% broadband availability.

CONNECT south carolina

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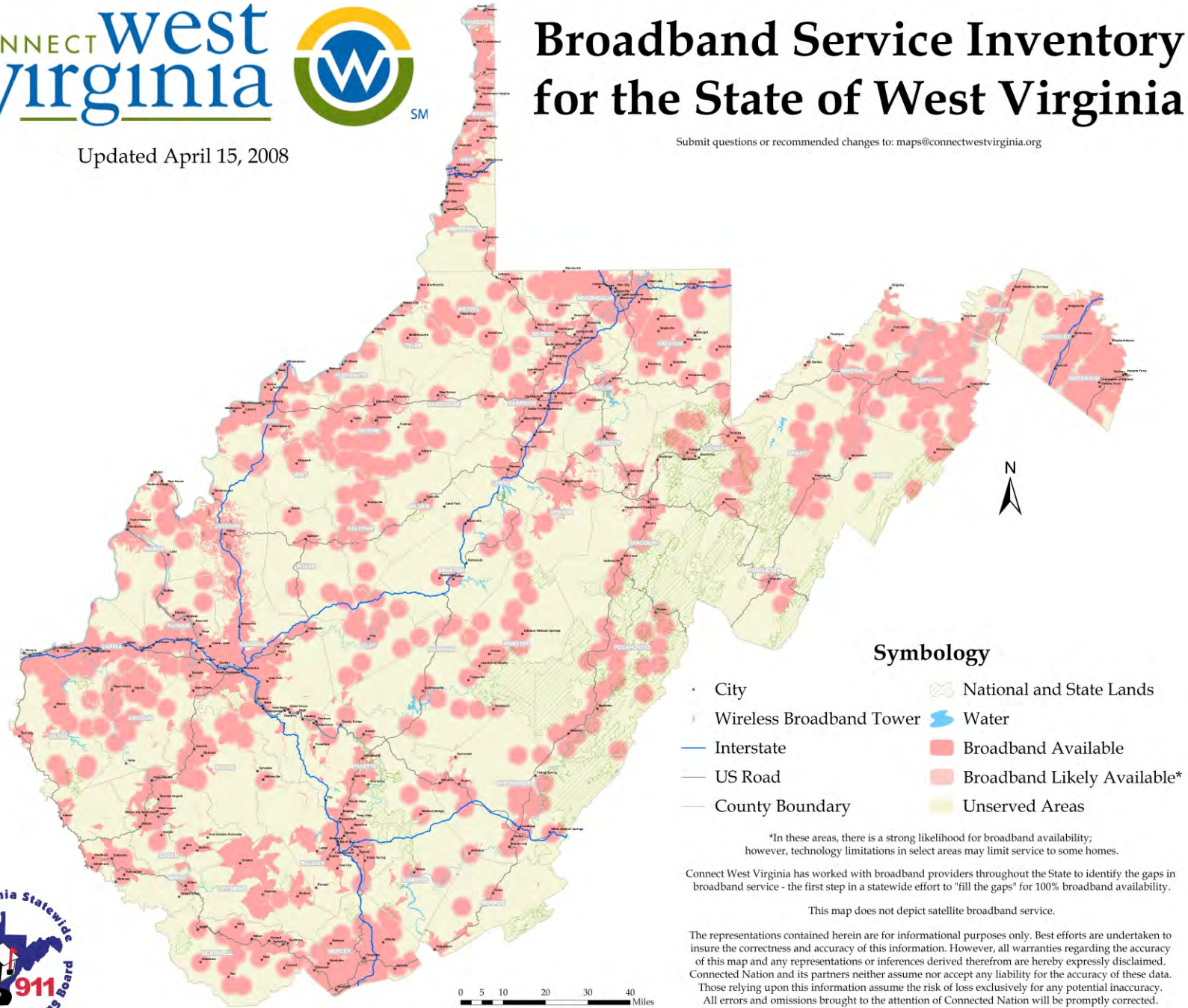
Broadband Availability Maps

CONNECT west Virginia

Broadband Service Inventory for the State of West Virginia

Updated April 15, 2008

Submit questions or recommended changes to: maps@connectwestvirginia.org



Symbology

- City
- Wireless Broadband Tower
- Interstate
- US Road
- County Boundary
- National and State Lands
- Water
- Broadband Available
- Broadband Likely Available*
- Unserved Areas

*In these areas, there is a strong likelihood for broadband availability; however, technology limitations in select areas may limit service to some homes.

Connect West Virginia has worked with broadband providers throughout the State to identify the gaps in broadband service - the first step in a statewide effort to "fill the gaps" for 100% broadband availability.

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West Virginia Statewide Addressing and Mapping Board 911

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Analyzing Unserved Areas

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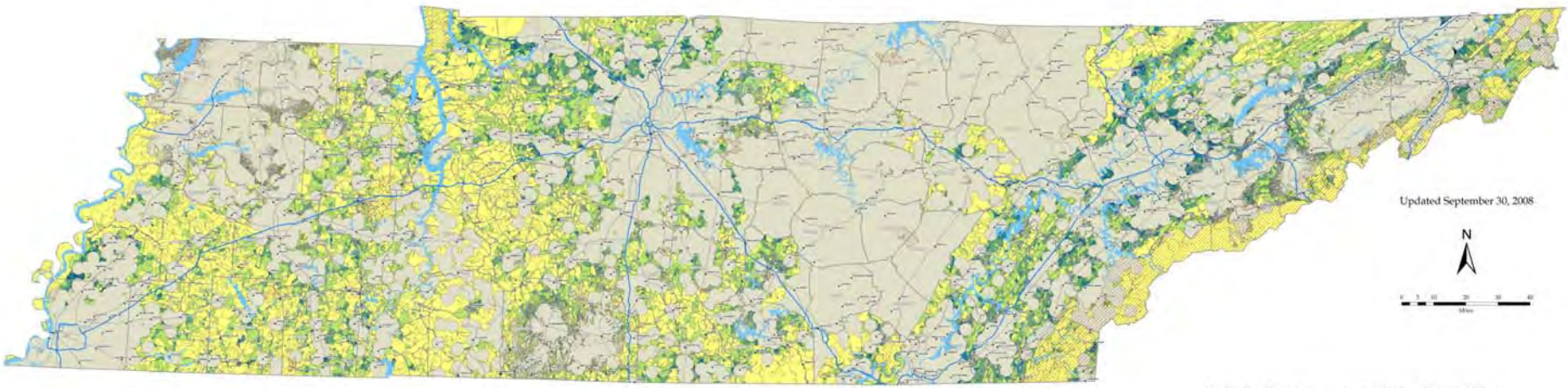
THE TRAIL TO INNOVATION

Density of Households Unserved by a Broadband Provider by Census Block

Submit questions or recommended changes to: maps@connectednation.org



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Symbology

- City
- Interstate
- US Road
- County Boundary
- Water
- National and State Lands

Number of Households per Square Mile, per Census Block

- 0 - 8
- 9 - 20
- 21 - 40
- 41 - 85
- 86+
- Area less than 0.25 square mile
- Broadband Available*

*Satellite broadband service is not included in broadband availability.

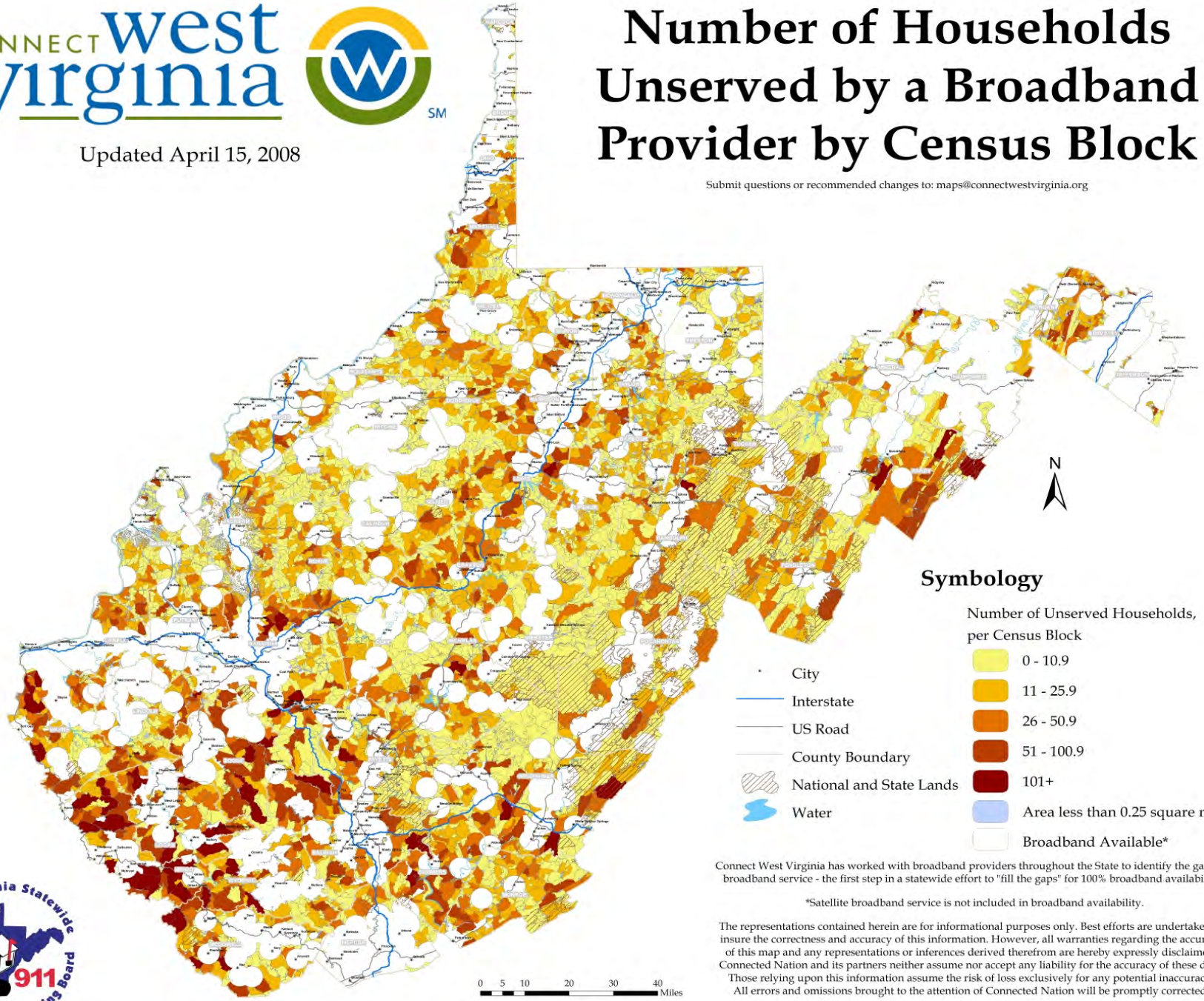
With the support of Governor Bredesen, the Department of Economic and Community Development, the Office for Information Resources, and the Tennessee Broadband Task Force, Connected Tennessee has worked with broadband providers throughout the State to identify the gaps in broadband service - the first step in a statewide effort to "fill the gaps" for 100% broadband availability.

CONNECT west Virginia SM

Updated April 15, 2008

Number of Households Unserved by a Broadband Provider by Census Block

Submit questions or recommended changes to: maps@connectwestvirginia.org



Symbology

Number of Unserved Households, per Census Block

- 0 - 10.9
- 11 - 25.9
- 26 - 50.9
- 51 - 100.9
- 101+
- Area less than 0.25 square mile
- Broadband Available*

- City
- Interstate
- US Road
- County Boundary
- National and State Lands
- Water

Connect West Virginia has worked with broadband providers throughout the State to identify the gaps in broadband service - the first step in a statewide effort to "fill the gaps" for 100% broadband availability.

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West Virginia Statewide Addressing and Mapping Board 911

Kentucky Broadband Service Inventory - Microsoft Internet Explorer provided by ConnectKentucky

http://12.180.242.34/KyBroadband/default.aspx

Kentucky Broadband Service Inventory

KENTUCKY BROADBAND SERVICE INVENTORY

ConnectKentucky | Connected Nation | Help | Map Your Address | Identify Broadband Providers

Tasks

Locate Address

Results

- 400 North Main St., Williamstown, KY, 41097 (3)
  - [x] 400 N MAIN ST, KY, 41097
  - [ ] 400 S MAIN ST, KY, 41097
  - [ ] 398 N MAIN ST, KY, 41097

Overview Map

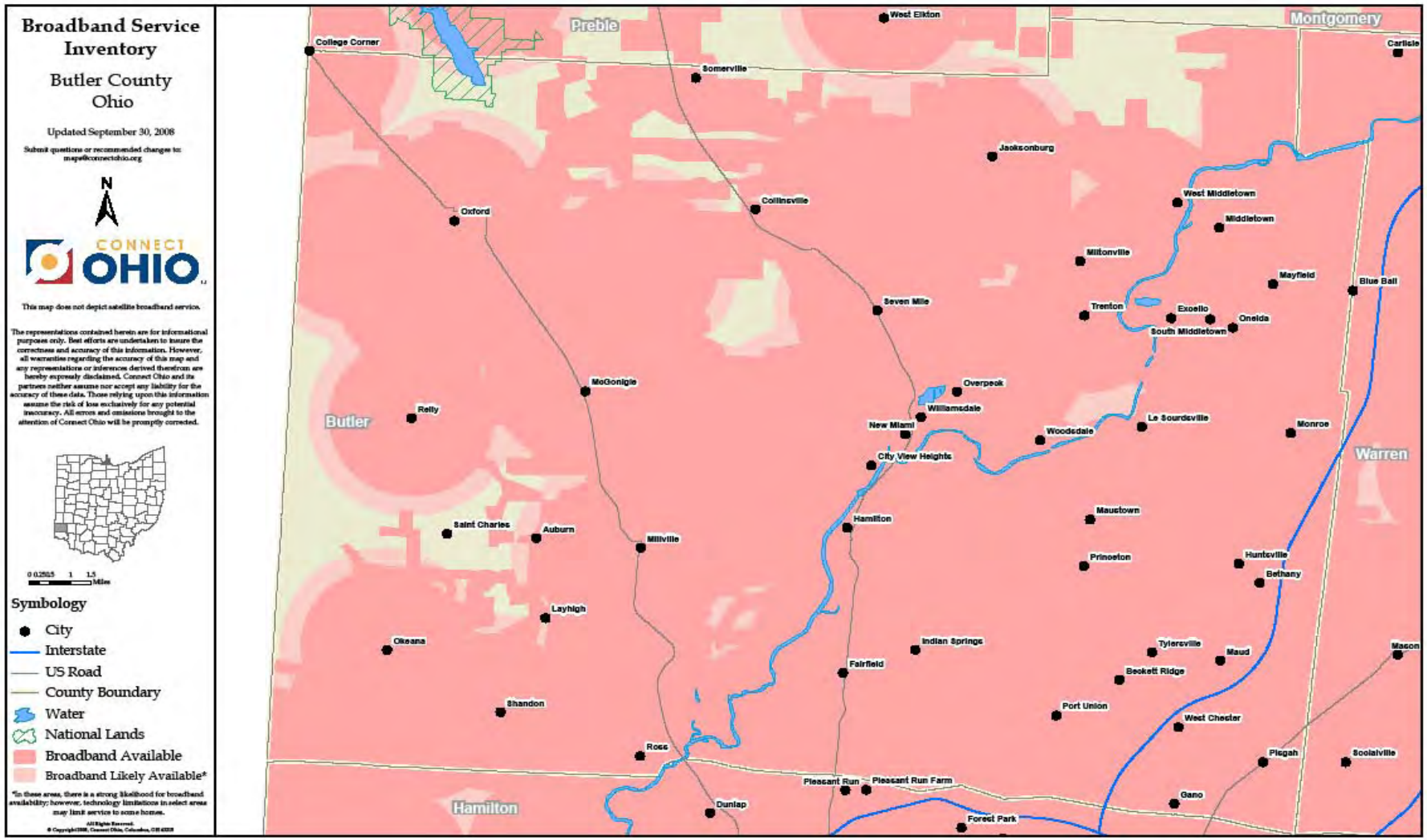
Legend

- [x] KyBroadband
  - [x] Incorporated City
  - [ ] Proposed Sewer Lines
  - [ ] Proposed Water Lines
  - [ ] Proposed Transportation Projects
  - [x] Interstate
  - [x] Parkway
  - [x] US Road

Internet 100%

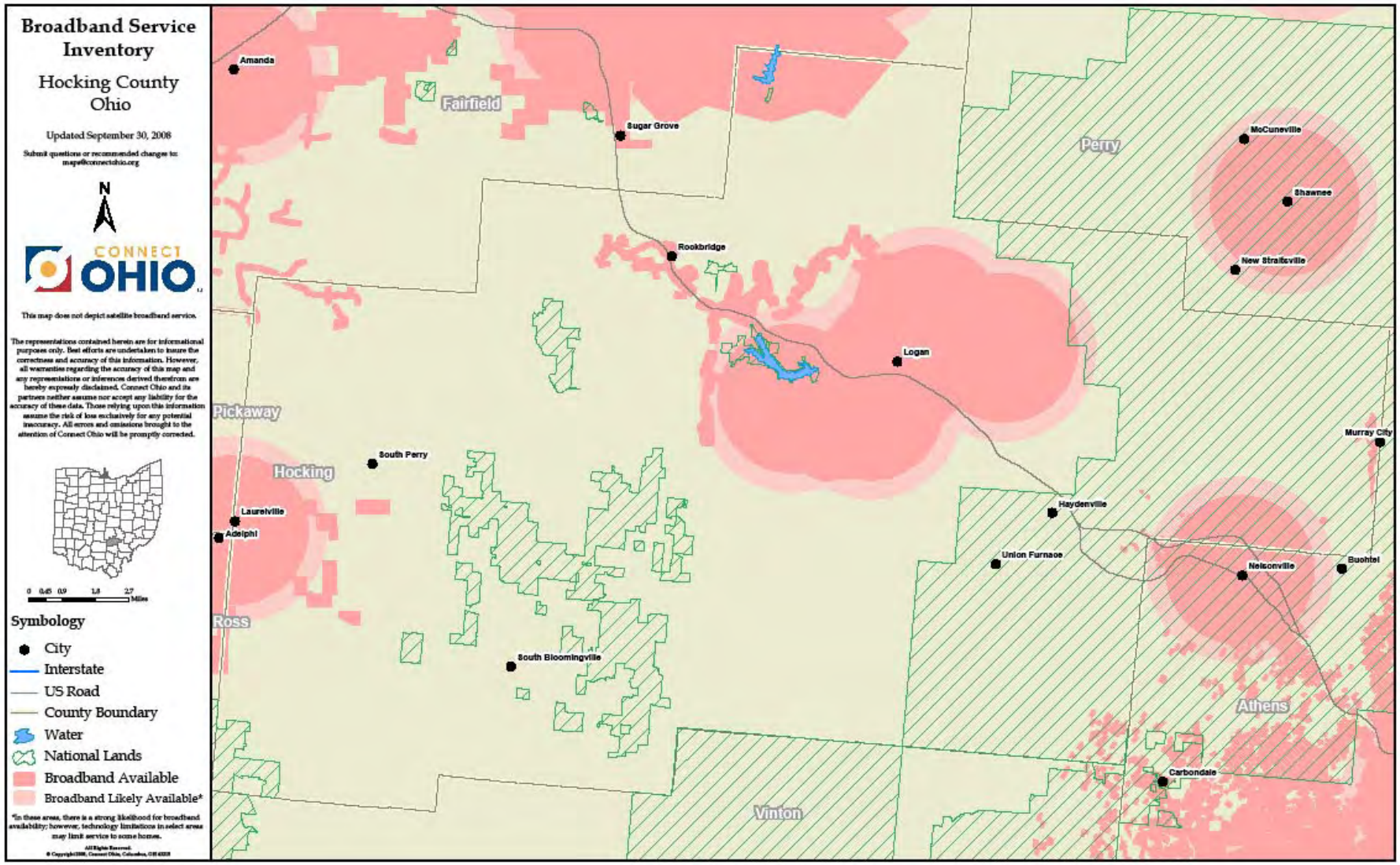
start | Inbox - Microsoft Out... | 20080513 KMB Video ... | Kentucky Broadband ... | 3:08 PM

Community-level data for providers, policymakers, & local planning efforts



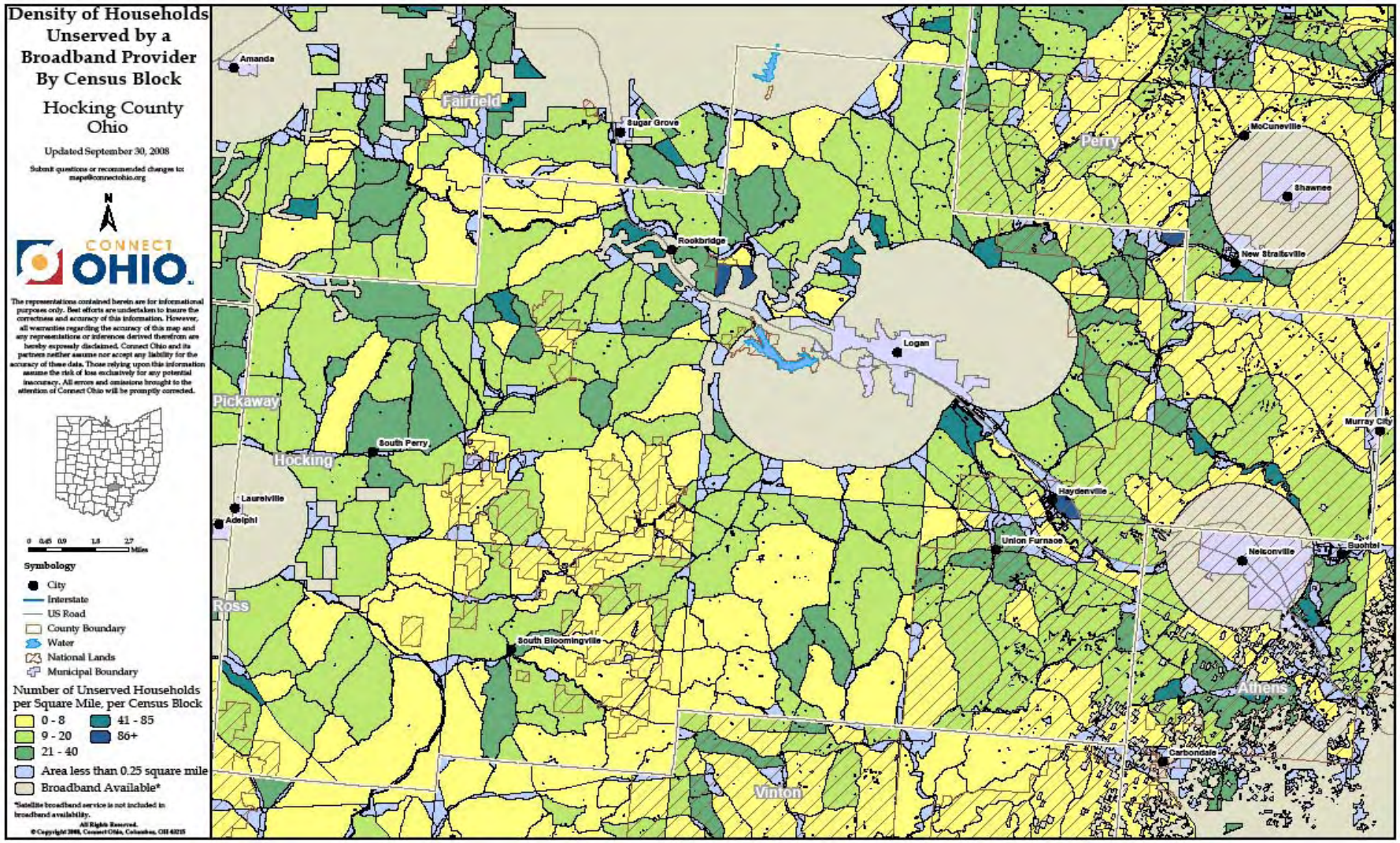
Community-level data for providers, policymakers, & local planning efforts

Hocking County, Ohio



Community-level data for providers, policymakers, & local planning efforts

Hocking County, Ohio



Other Maps:
Upload & Download Speeds & Broadband Inquiries

- **Connected Nation will also produce a statewide broadband speed map that will depict average *actual* upload and download speeds at the county level of detail for all providers in that county. The data for this map will be obtained from speedtest.net, speedmatters.org, and the speed testing tool on the Connect North Carolina web site.**
- **Connected Nation will also track broadband availability inquiries submitted via the Connect North Carolina web site and will periodically provide that data, including interested subscribers, to the state's broadband providers. A map pinpointing the physical address of each inquiry can be created upon request.**

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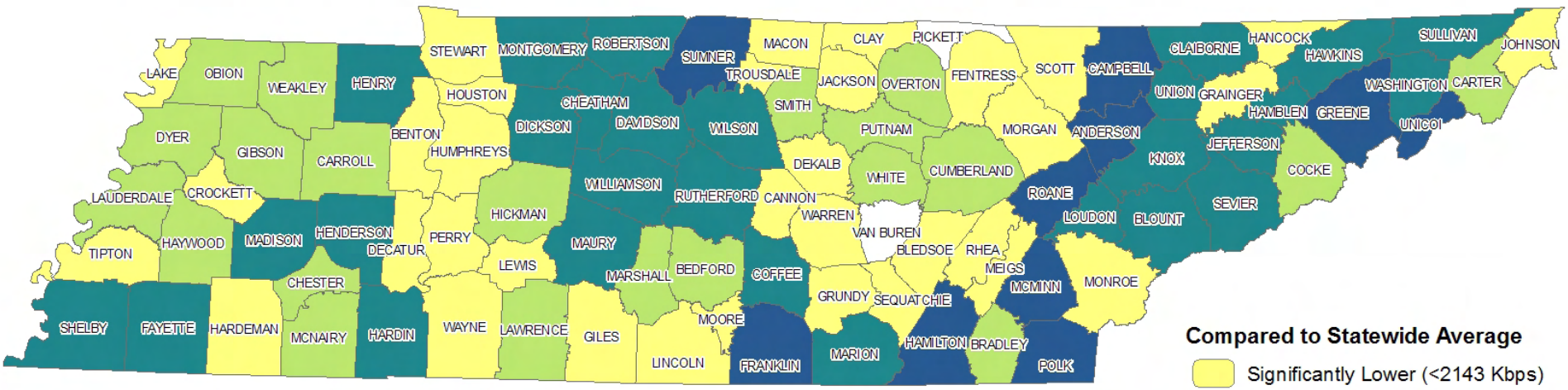
Average Residential Download Speed for the State of Tennessee

Submit questions or recommended changes to: maps@connectednation.org



Compared to Statewide Average

- Significantly Lower (<2143 Kbps)
- Lower (2143 - 3611 Kbps)
- Higher (3611 - 6381 Kbps)
- Significantly Higher (>6381 Kbps)
- Insufficient Sample

Average Statewide Download Speed: 3611 KBPS

Updated June 5, 2008

This map shows average download speeds based on the residential broadband speed tests in each county. The map does not reflect commercial or business broadband speeds, broadband availability or adoption, nor does it show available bandwidth within an area.

Information represented herein reflects speed test data provided by Speedtest.net, CWA's speedmatters.org and Connected Tennessee's Speed Test.

Speed Matters

SPEEDTEST.NET

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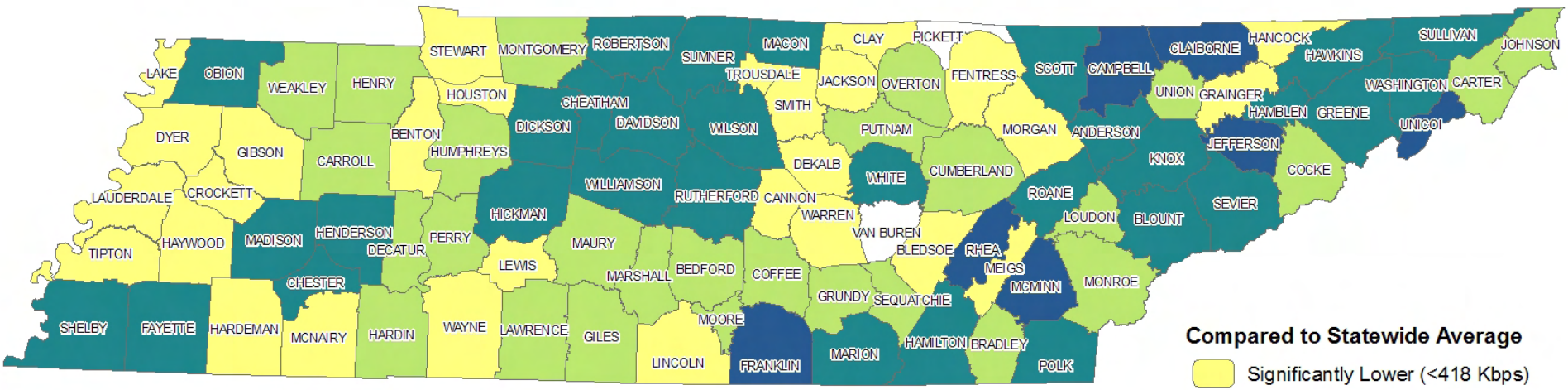
CONNECTED Tennessee
THE TRAIL TO INNOVATION℠

Average Residential Upload Speed for the State of Tennessee

Submit questions or recommended changes to: maps@connectednation.org



Average Statewide Upload Speed: 692 KBPS

Updated June 5, 2008

This map shows average upload speeds based on the residential broadband speed tests in each county. The map does not reflect commercial or business broadband speeds, broadband availability or adoption, nor does it show available bandwidth within an area.

Information represented herein reflects speed test data provided by Speedtest.net, CWA's speedmatters.org and Connected Tennessee's Speed Test.

Speed Matters SPEEDTEST.NET

The Five Key Components of the Connected Nation Model

- **Street-Level Broadband Infrastructure Mapping**
- **Market Intelligence through Survey Research**
- **Services to Providers and Local Governments**
- **Demand Creation and Planning at the Grassroots Level**
- **Computers for Underprivileged Households**

Key Component #2:
Market Intelligence through Survey Research
Statistically-significant survey samples in EACH county

- **What are the barriers that are keeping people from adopting broadband?**
  - **Simply a lack of availability?**
  - **Computer ownership is low?**
  - **Lack of computer literacy?**
  - **Perceived lack of value to one's life?**
  - **Is the cost too high?**

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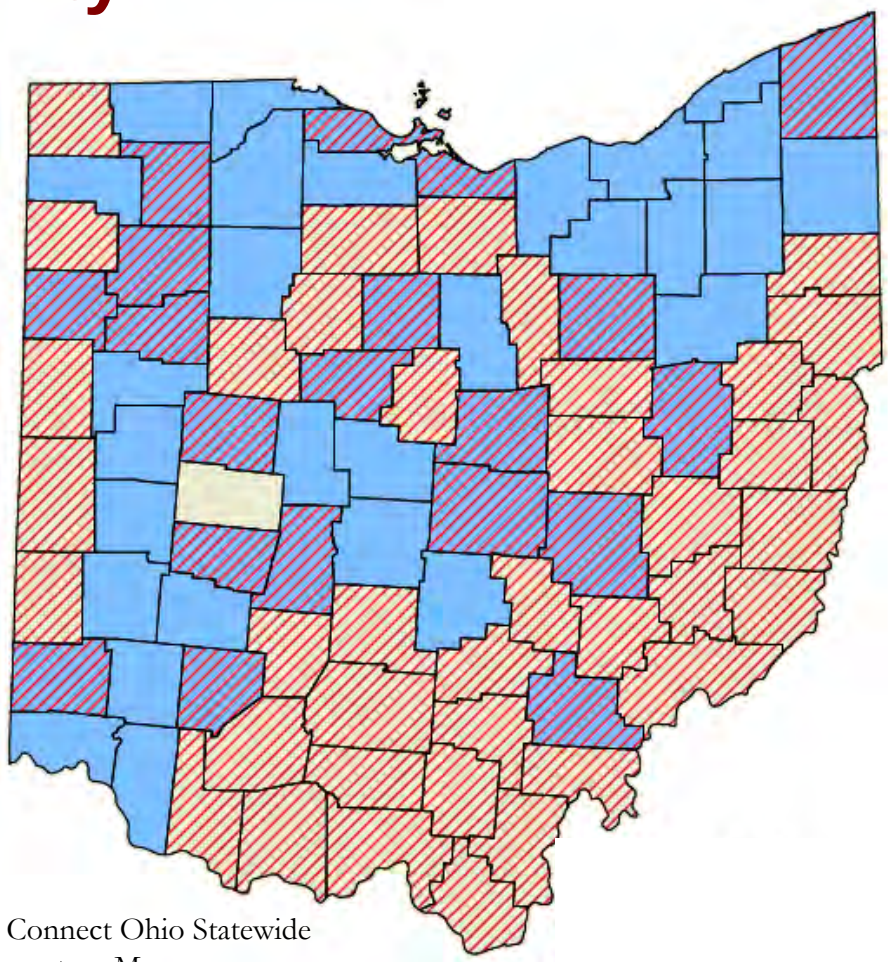
Ohio Broadband Availability and Adoption by County

Low broadband adoption is not limited to areas with low broadband availability.

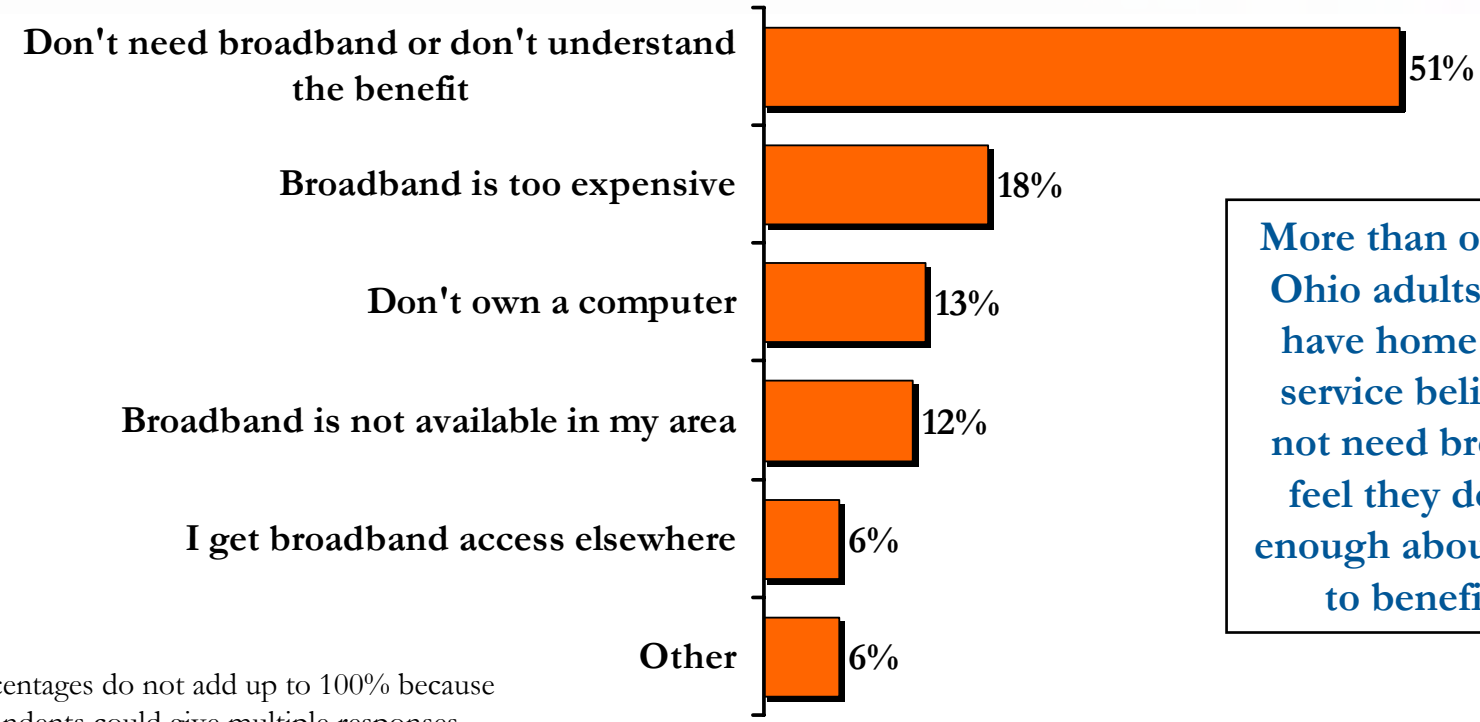
92% of Ohioans have broadband availability, yet only 55% actually subscribe.



Source: 2008 Connect Ohio Statewide Broadband Inventory Map

Barriers to Broadband Adoption

Among Ohio residents who do not subscribe to home broadband service:*



More than one-half of all Ohio adults who do not have home broadband service believe they do not need broadband, or feel they do not know enough about broadband to benefit from it.

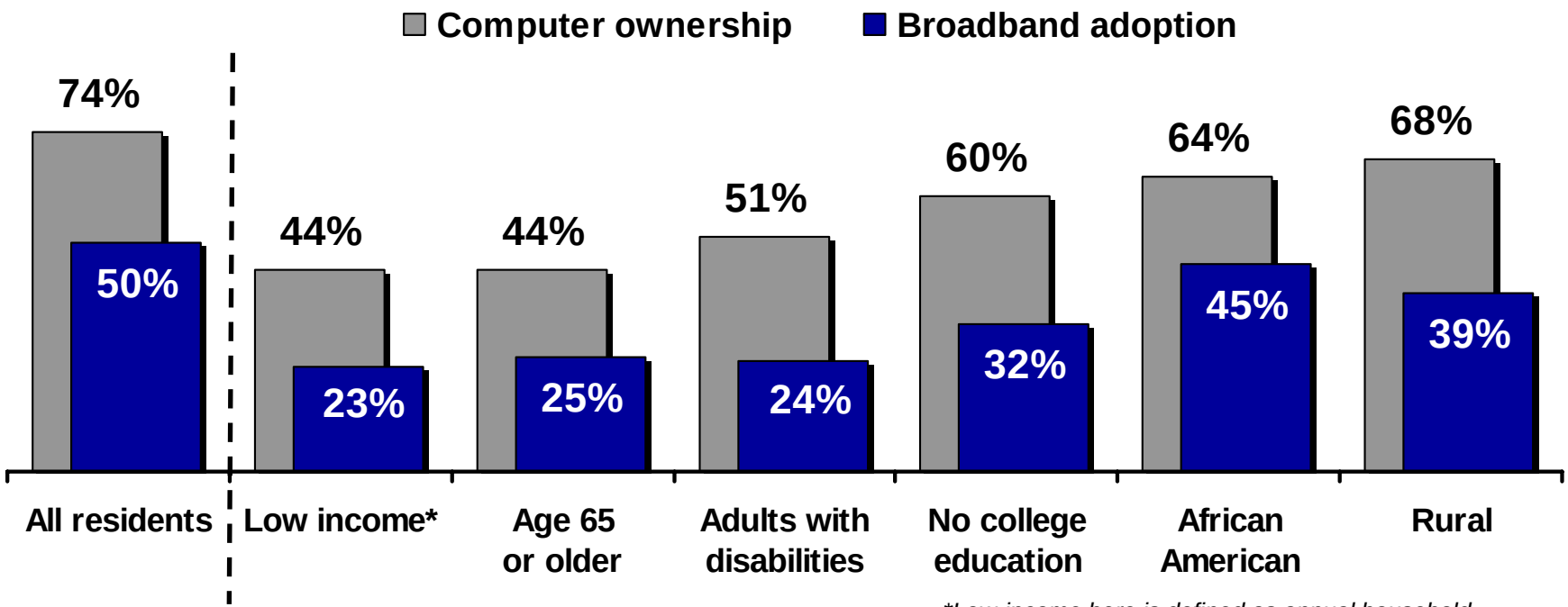
*Percentages do not add up to 100% because respondents could give multiple responses.

Q: Why don't you subscribe to broadband Internet service?
Or if broadband is not available:
Q: Why wouldn't you subscribe to broadband Internet service?
(n = 542 OH residents with no home broadband service)

Source: 2008 Connect Ohio Statewide Residential Technology Assessment

Computer Ownership and Broadband Adoption Among Demographic Groups

Computer ownership and broadband adoption are lower than average among several demographic groups.



Q: Does your household have a computer?
Q: Which of the following describe the type of Internet service you have at home?
n = 3,005 residents in Ohio, Tennessee and Kentucky

**Low-income here is defined as annual household income less than $25,000*
Source: 2007-2008 ConnectKentucky, Connected Tennessee, and Connect Ohio Residential Technology Assessments

The Four Key Components of the Connected Nation Model

- **Street-Level Broadband Infrastructure Mapping**
- **Market Intelligence through Survey Research**
- **Demand Creation and Planning at the Grassroots Level**
- **Computers for Underprivileged Households**

Key Component #3:
Demand Creation and Planning at the Grassroots Level

- **Facilitate a county by county statewide technology awareness and planning campaign that:**
  1) **Takes inventory of all the resources that the state and private sector have developed that could be deployed at the community level in a more coordinated fashion so as to build demand for computing applications and increase computer literacy;**
  2) **Leverages existing regional and community leadership infrastructure for assessment and visioning in technology planning;**
  3) **Monitors and measures positive impact over time**
  4) **Coordinates technology planning for both private and public entities in every county to identify relevant applications and drive adoption across nine different community sectors**

Key Component #3:
Demand Creation and Planning at the Grassroots Level

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CONNECTED NATION

Organization: _____

Your Name: _____

This assessment tool is designed to quickly assess where the community stands today. A rating of ***Level 1 is the lowest,*** *Level 5 is the highest* and ***Level 0 is disconnected.***

AGRICULTURE

Stage	Networked Places	Applications & Services	Leadership
0	Not using the Internet.	No computer use. No website. All contacts via phone and postal mail.	There is no technology or telecom plan.
1	**Some** growers, suppliers and processors have limited access through a dial-up connection.	**Some** growers, suppliers and processors use e-mail and Internet.	The Internet is seen as a possible enhancement to the way daily business is conducted.
2	**Some** growers, suppliers and processors have always-on connections to the Internet at their desks.	**Some** growers, suppliers and processors have an informational website. **Some** growers, suppliers and processors transmit or receive some orders electronically.	The Internet is seen as essential to business operations. Employees are trained on basic applications.
3	**Most** growers, suppliers and processors have always-on connections to the Internet. **Some** mobile workers have laptop computers and can access the network remotely. Affordable videoconferencing facilities are available in the community.	**Most** growers, suppliers and processors have informational websites. **Some** websites can accept credit card purchases. **Some** growers, suppliers and processors participate in the electronic supply chain.	**Some** suppliers and processors permit employees periodically to telework. **Some** growers, suppliers and processors encourage employees to take work-related classes **offline**.
4	**Some** growers, suppliers and processors use VoIP to save money. **Some** workers have converted from desktop computers to portable devices with wireless connections. **Some** office computers have webcams for videoconferencing.	**Some** growers, suppliers and processors out-source most of their computing services. **Some** growers, suppliers and processors sell goods out of state or internationally.	Training on new technology is a priority. **Some** suppliers and processors permit employees to telework one or two days a week. **Some** facilities encourage employees to take work-related courses **online**.
5	**Most** growers, suppliers and processors use VoIP to save money. **Most** computers have video cameras. **Some** growers, suppliers and processors use Radio Frequency Identification (RFID) to track inventory and equipment.	**Some** growers, suppliers and processors send and receive video mail. **Some** growers, suppliers and processors outsource most of their computing services. **Some** growers, suppliers and processors routinely use multiparty videoconferencing to coordinate operations.	**Some** suppliers and processors have restruc-tured to focus on their core contribution and outsource nonessential functions. New hires are required to have experience using new technology in business applications.

Community Benchmarking/ Assessment Tool

Based on a series of metrics developed by Connected Nation, participants assess their sector on a scale of 0 to 5 and share their vision

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CONNECTED NATION

Sector: ❑ Agriculture ❑ Business & Industry ❑ Community-Based Organizations ❑ Government ❑ Healthcare ❑ Higher Education ❑ K-12 ❑ Libraries ❑ Tourism, Recreation & Parks

Name: _____

Organization: _____

COMMUNITY BENCHMARK WORKSHOP

Column	Current Assessment	2-Year Goal	Comments/Notes
	0 1 2 3 4 5	0 1 2 3 4 5	
Networked Places			
Applications & Services			
Leadership			

Define Current State
resources, applications, limitations/barriers, etc.:

Explain Future Vision
How advanced communications services will make your sector more successful (include resources and applications needed or desired):

2-3 Ideas for Action Initiatives
Ways to help your sector achieve your two-year goals and get you closer to your vision. Please include cross-sector idea.

★

★

★

Community Benchmarking/ Assessment Tool

Based on a series of metrics developed by Connected Nation, participants assess their sector on a scale of 0 to 5 and share their vision

The Four Key Components of the Connected Nation Model

- **Street-Level Broadband Infrastructure Mapping**
- **Market Intelligence through Survey Research**
- **Demand Creation and Planning at the Grassroots Level**
- **Computers for Underprivileged Households**

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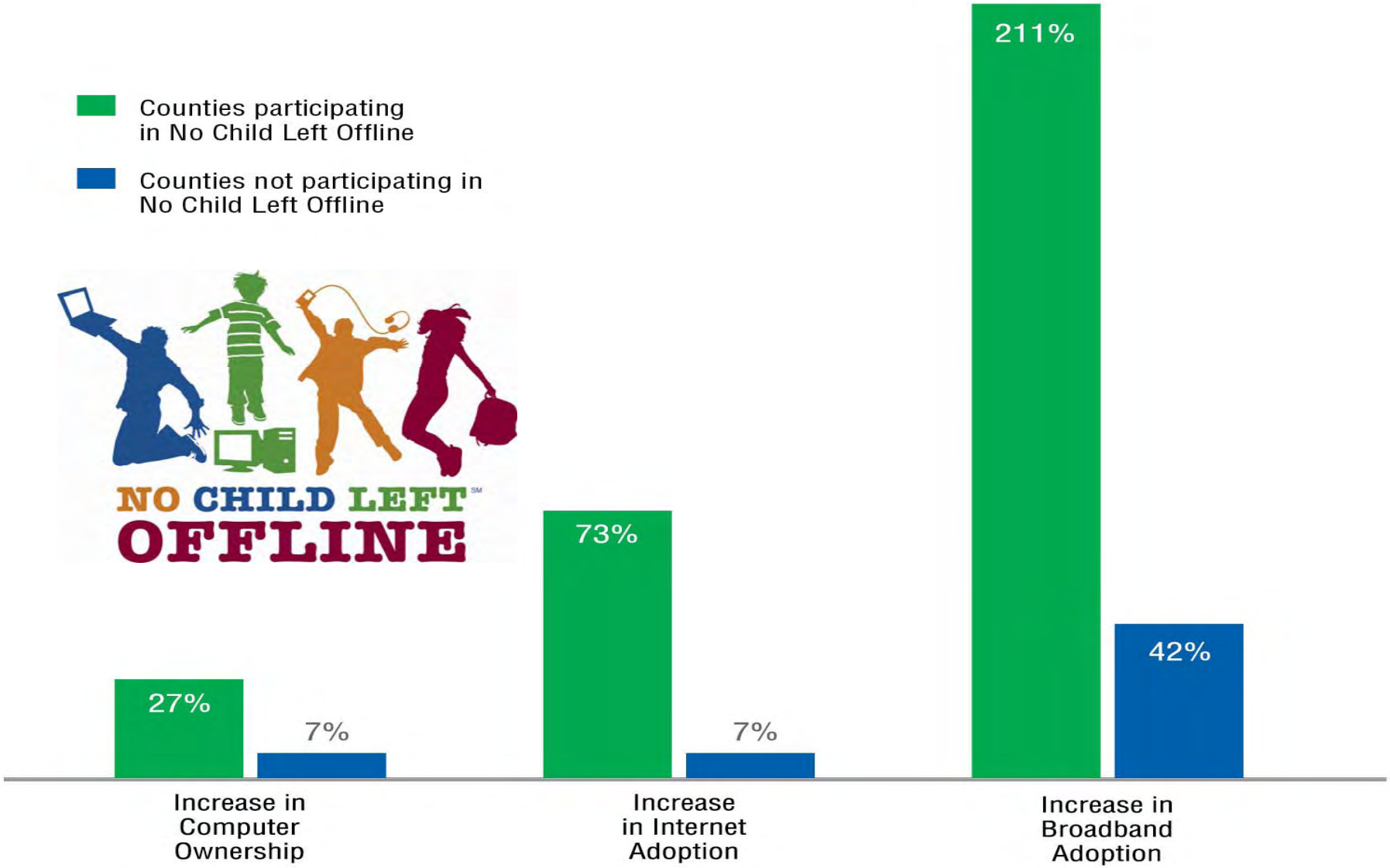
Key Component #5:
Computers for Underprivileged Households

- **Nearly all youths between 12-17 use the Internet for school work – but children from low income families are half as likely to have a computer at home**
- **In collaboration with the state, the private sector, and private foundations, we distribute low-cost new and/or refurbished state-retired computers to the homes of underprivileged middle school students**



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.

Broadband Mapping Initiative

House Select Committee on
High Speed Internet in Rural Areas
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