

**OFFICIAL APRIL 2011 UPDATE SUBMISSION TO
THE NATIONAL TELECOMMUNICATIONS AND INFORMATION
ADMINISTRATION UNDER THE
STATE BROADBAND DATA AND DEVELOPMENT GRANT PROGRAM
FOR THE STATE OF TENNESSEE**



CONNECTED
Tennessee
THE TRAIL TO INNOVATION®

April 1, 2011

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TENNESSEE COVER LETTER

April 1, 2011

Ms. Anne W. Neville
SBDD Grant Program Director
National Telecommunications and Information Administration
U.S. Department of Commerce
1401 Constitution Avenue, NW Room 4716
Washington, DC 20230

Dear Ms. Neville:

It is with highest regard that the collective stakeholders of Connected Tennessee offer congratulations to the U.S. Department of Commerce's National Telecommunications & Information Administration (NTIA) on the recent release of the National Broadband Map. This extraordinary milestone demonstrates the intense and joint effort of the NTIA, FCC, state governments, industry, and non-profits like Connected Nation, Connected Tennessee's parent organization, and will serve as a key tool for the American public and policymakers resulting in smarter investments and targeted state and local broadband policies and programs. We are proud of the role that Connected Tennessee has played in creating such a powerful tool that will surely benefit not just Tennesseans, but consumers and businesses nationwide.

Therefore, Connected Tennessee, as the State Broadband Designated Entity, in partnership with the Department of Finance and Administration's Office for Information Resources and Department of Economic and Community Development among other agencies, is pleased to present this submittal of the State of Tennessee's State Broadband Data and Development (SBDD) Grant Program, known as Connected Tennessee.

These artifacts should be found to be compliant with the April 1, 2011, deadline for the semi-annual data update and in accordance with the terms of the July 1, 2009, Notice of Funds Availability (NOFA) and all subsequent clarifications pertaining to delivery of State-Level Mapping of Broadband Service Availability. This packet includes:

Inventory of Deliverables, Connected Tennessee: April 1, 2011

| <u>NOFA Requirement</u> | <u>Data Transfer Model</u> | <u>Data Description</u> |
|-------------------------|----------------------------|---|
| Appendix A: 1(a)(i) | BB_Service_CensusBlock | Broadband Service Availability of Facilities-Based Providers in Census Blocks of No Greater Than Two Square Miles in Area |
| Appendix A: 1(a)(ii) | BB_Service_RoadSegment | Broadband Service Availability of Facilities-Based Providers by Road |

| | | |
|-------------------|-------------------------------|---|
| Appendix A: 1(b) | BB_Service_Wireless | Segment in Census Blocks Larger in Area Than Two Square Miles Broadband Service Availability of Wireless Services Not Provided to a Specific Address |
| Appendix A: 3(b) | BB_ConnectionPoint_MiddleMile | Broadband Service Infrastructure Middle-Mile and Backbone Interconnection Points |
| Appendix A: 4 | BB_Service_CAInstitutions | Community Anchor Institutions-Listing |
| Appendix A: 4 | n/a | Community Anchor Institutions-Narratives |
| VII.A.1(a) n/a | n/a DataPackage.xlsx | Accuracy and Verification Report Worksheets of Contact Information, Data Dictionary, and Provider Summary Table |
| n/a | n/a | Broadband Provider Roster and Participation Status |

In addition, this data update submission should be found to be compliant with the additional program requirements instituted by the National Telecommunications and Information Administration since the time of the October 2010 SBDD data submission for the Connected Tennessee program. Specifically, these new requirements are:

SBDD Data Transfer Model

The submission of the broadband dataset for April 1, 2011, is contained within the SBDD Data Transfer Model as released on the Grantee Workspace on January 14, 2011. All efforts have been made to comply with formatting, domain, and metadata requirements to include as much information on each provider as possible.

Additional Submission Guidance

This submission also includes the updated DataPackage spreadsheet with enhanced provider listings as well as satisfactory outputs from the SBDD_Check toolbox to ensure fewer unexpected values with the submitted broadband datasets prior to federal processing for the National Broadband Map update.

It is therefore with great pleasure that the Connected Tennessee program submits this April 2011 semi-annual data update under the State Broadband Data and Development Grant Program. We will continue to implement the joint purposes of the Recovery Act and the Broadband Data Improvement Act (BDIA) by gathering comprehensive and accurate state-level broadband mapping data, developing state-level broadband maps, aiding in the development and maintenance of the National Broadband Map, and undertaking statewide initiatives for broadband planning.

Broadband Service Availability — Provider Outreach and Verification

This data update submission under the SBDD includes the participation of approximately 86.67% of the Tennessee provider community, or 78 of 90 total providers. Of the 78 participating providers, 27 supplied an update to their network or coverage area(s), while 47 have reported no change. The remaining 4 represent providers who previously supplied data but were non-responsive in the April 2011 update effort; therefore their previous dataset is being put forward as part of this compilation. A complete roster by provider depicting participation status and contact record is contained herein. Of the 12 providers that are not represented in the attached datasets, 7 have either refused to participate in the voluntary program or have remained unresponsive to the numerous attempts at contact by Connected Tennessee. The remaining 5 providers are currently in some form of progress toward data submission but were not able to either submit or verify coverage areas at the time of this submission.

As the aforementioned roster and attached methodology documentation will attest, it is the collective opinion of the Connected Tennessee principals that all commercially reasonable efforts were made to account for 100% of the known Tennessee broadband provider community, pursuant to this semi-annual data update submission.

Connected Tennessee has also continued to perform broadband verification activities through several means. In addition to confirmation of service area(s) by each provider, Connected Tennessee conducts field validation efforts. To date, 30 (33.33%) providers have been validated through field verification activities. Additional details on verification activities are contained within the Field Validation Narrative.

At the program's inception, Connected Tennessee launched a website to create awareness about the initiative. connectedtennessee.org continues to serve a prominent role in the outreach and data collection effort. This program asset provides a way for the general public to participate in the process by offering interactive tools for users to test their connection speed, submit broadband inquiries, or contact a program representative.

As an indicator of stakeholder penetration, the Connected Tennessee website encountered 6,241 unique visits during this reporting period (27,071 total to date for the life of the grant awarded on December 20, 2009). Additionally, this pronounced Web activity netted 380 broadband inquiries over this same reporting period (1,263 grant inception to date). The website also provides the BroadbandStat application, which allows the consumer to confirm or dispute the coverage represented on the broadband inventory map. These consumer initiated actions are facilitated through the Connected Tennessee website and the Connected Tennessee Interactive Mapping Tool (BroadbandStat) that offer the citizens the vehicles to provide information regarding availability in their respective service area, either in affirmation or contest of the reported data represented in the Connected Tennessee mapping artifacts. Since the initial data collection and release of corresponding maps, feedback in the form of broadband inquiries has allowed Connected Nation to identify additional areas that are in need of field validation, which is scheduled as soon as possible.

Community Anchor Institutions

Connected Tennessee has established an ongoing mechanism for gathering data on the location and broadband connectivity of Community Anchor Institutions (CAI), in accordance with the data requirements of the SBDD NOFA Technical Appendix.

In conjunction with the State of Tennessee, outreach was conducted during this data update reporting period by Connected Tennessee to continue identification of existing, centralized sources for CAI connectivity data. During this reporting period Connected Tennessee secured data from the NetTN network. NetTN provides broadband service to state agencies, local governments, institutions of higher education, K-12 schools, libraries, eHealth, 911, and non-profits throughout the State of Tennessee. Additionally, outreach was coordinated to distribute the CAI survey to institutions throughout the state through multiple methods including a customized online survey available on the Connected Tennessee website. During this reporting period Connected Tennessee has continued to utilize the contacts of statewide associations and partners to promote the importance of broadband connectivity at anchor institutions and participation in this data collection process. Connected Tennessee will continue to build upon these relationships over the coming months to collect data and raise awareness of this project.

While we continue to document institutions and the related addresses, the connectivity data collected in most categories remains incomplete at this time. Connected Tennessee will be implementing a number of new processes to increase participation including launching a CAI newsletter to connect communities across the state, increasing industry-specific planning to target new community contacts, and revising the CAI portion of our website to increase visibility and content. From our work in Tennessee, as well as other states, we recognize the great value of this data to future collaboration efforts within the state and its value to the recently released National Broadband Map. We plan to continue to bring best practices to the Connected Tennessee efforts, along with an investment of both human and technical resources required to reach our goal of increasing the data that is secured and reported as part of this process.

The Connected Tennessee program exists to improve data on the deployment and adoption of broadband services and to assist in the extension of broadband technology across all regions of the great State of Tennessee, as well as the United States through contribution to the National Broadband Map. We look forward to the continuing work ahead.

Respectfully submitted,



Michael L. Ramage
Executive Director
Connected Tennessee



Thomas W. Ferree
Chief Operating Officer
Connected Nation, Inc.

DATA ACQUISITION: TENNESSEE COMMUNITY ANCHOR INSTITUTIONS

In this third reporting period of the SBDD, Connected Tennessee, working in close coordination with the State of Tennessee, has established an ongoing mechanism for gathering data on the location and broadband connectivity of Community Anchor Institutions (CAI), in accordance with the data requirements of the SBDD NOFA Technical Appendix. During this reporting period Connected Tennessee has continued to focus efforts on conducting outreach and raising awareness of this important project.

Connected Tennessee has continued to identify and process CAI data obtained through an ongoing statewide outreach campaign. Physical address information continues to be augmented through manual sourcing and geocoded by Connected Tennessee through ESRI ArcGIS software.

Connected Tennessee continues to utilize a customized online survey on the Connected Tennessee website that was developed during the first reporting period. This survey, in combination with a customized data gathering spreadsheet, was distributed to a targeted list of CAI throughout the state. Connected Tennessee will continue to use these data gathering tools for future targeted outreach efforts throughout the coming months leading up to the next reporting period. These materials are customized to fit the CAI categories as defined in the SBDD NOFA.

The survey can be accessed at this link:

http://www.connectedtennessee.org/broadband_landscape/community_anchor_institution_survey.php

Connected Tennessee has worked diligently during this reporting period to conduct research as part of an ongoing process to identify existing, centralized sources for CAI connectivity data. Through our partnership with the State of Tennessee, an existing statewide CAI broadband network was identified and the data has been included in this reporting submission. The NetTN network database includes over 1,800 complete connectivity data points for CAI in all sectors. More information about this network can be found on the NetTN website, <http://www.nettn.net/Home.aspx>.

In tandem with these efforts to identify existing data, Connected Tennessee continues to identify key CAI contacts among all CAI categories in an effort to distribute and promote the online survey and raise awareness of the importance of CAI broadband connectivity.

Connected Tennessee has an ongoing mission to educate CAI throughout the state on the importance of participating in the project. Participation by these institutions will raise awareness about the importance of broadband connectivity and the need to report the requested data for inclusion on the National Broadband Map. To assist with our data collection efforts, Connected Tennessee is developing a CAI newsletter to be distributed quarterly beginning in April 2011. The newsletter will highlight a CAI in Tennessee, encourage institutions to share their data, and highlight the National Broadband Map.

The greatest challenge with collecting this data continues to be the difficulty in securing CAI broadband connectivity data specifically for public safety and healthcare CAI. Connected Tennessee will continue its ongoing work with the State of Tennessee and key organization contacts in an effort to raise awareness of this project among CAI.

A CAI summary of all processed and submitted data is provided below:

| CAI Type | Total | Physical Address | Lat/Long | Technology of Transmission | Download Speed | Upload Speed |
|------------------------|--------------|------------------|--------------|----------------------------|----------------|--------------|
| K-12 Schools | 2,396 | 2,396 | 2,396 | 760 | 760 | 759 |
| Libraries | 259 | 259 | 259 | 231 | 231 | 231 |
| Healthcare | 825 | 825 | 825 | 113 | 112 | 112 |
| Public Safety | 742 | 742 | 738 | 257 | 101 | 101 |
| Higher Ed Institutions | 317 | 317 | 316 | 156 | 160 | 104 |
| Other Government | 1,262 | 1,262 | 1,261 | 1,181 | 1,141 | 1,140 |
| Other Non-Government | 164 | 164 | 163 | 72 | 69 | 69 |
| Total | 5,965 | 5,965 | 5,958 | 2,770 | 2,574 | 2,516 |

SBDD DATA SUBMISSION METHODOLOGY

The submission of the broadband dataset for April 1, 2011, is contained within the SBDD Data Transfer Model and additional components as released on the Grantee Workspace on January 14, 2011. Connected Nation has reviewed all literature that relates to the release and use of this data transfer model and recognizes that it does not replace or dictate how data is stored, processed, or displayed for the state or territory, as it is meant primarily as a means to transfer the broadband data from all states and territories and populate the National Broadband Map in a seamless fashion. Guidance from the Technical Mapping Guide, as released on the Grantee Workspace on March 24, 2011, was also followed to ensure the completeness and validity of the submission through completion steps and checklists, completing the DataPackage spreadsheet, uploading broadband datasets into the Data Transfer Model, and checking the dataset using the SBDD_CheckSubmission receipt process.

In addition to the narratives and methodologies contained herein, as well as the DataPackage.xls containing contact information, the data dictionary, and a provider summary table, the following feature classes are submitted within the SBDD Data Transfer Model for the State of Tennessee.

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| Appendix A: 1(a)(ii) | BB_Service_RoadSegment | Broadband Service Availability of Facilities-Based Providers by Road Segment in Census Blocks Larger in Area Than Two Square Miles. |
| Appendix A: 1(b) | BB_Service_Wireless | Broadband Service Availability of Wireless Services Not Provided to a Specific Address. |
| Appendix A: 3(b) | BB_ConnectionPoint_MiddleMile | Broadband Service Infrastructure Middle-Mile and Backbone Interconnection Points. |
| Appendix A: 4 | BB_Service_CAIstitutions | Community Anchor Institutions-Listing. |

The provider data collected by Connected Nation on behalf of the State of Tennessee have been formatted per the given specifications and uploaded into the appropriate feature classes of the SBDD Data Transfer Model. Wireline availability is contained within census blocks and road segments, wireless availability is contained as polygons of coverage areas, and middle-mile connections and community anchor institutions are contained as point data. All speed data is contained at the census block, road segment, or wireless polygon level of availability. All efforts have been made to comply with formatting, domain, and metadata requirements to include as much information as possible.

Connected Nation has continued outreach to satellite providers on their availability, technology, and speed information, but it is not included in this submission dataset. Additional information is necessary to be able to show where service satisfactorily exists in the state, rather than submitting the entire boundary of the state as the serviceable area. Analysis information distributed and discussed with the satellite providers, as well as any additional guidance from the Program Office on the desired analysis for satellite-serviceable areas, will be implemented for the October 2011 data submission.

TENNESSEE FIELD VALIDATION NARRATIVE

Connected Nation focused a portion of its time on specific validation processes such as:

- conducting random spectrum analysis studies throughout the state using an Avcom PSA-37-XP spectrum analyzer;
- conducting mobile speed tests throughout the state using an iPhone, Android (or other smart phone) as well as provider-specific aircards (Sprint 3G/4G, Clearwire et al);

- identifying pre-selected, provider-submitted wireless transmit tower sites and cross-referencing data about that tower against the Federal Communications Commission (FCC) databases such as Antenna Structure Registration and/or the Universal Licensing System;
- cross-referencing Federal Registration Number data against available FCC Form 477 data as well as the FCC **CO**mmission **RE**gistration **S**ystem (CORES);
- validating provider submitted data (for example: latitude/longitude) using a handheld Garmin eTrex Summit GPS unit or GPS enabled software such as Microsoft Streets and Trips;
- locating physical wire-line attributes (such as remote terminals, CATV plant, etc.) and comparing them against provider submitted data; and
- conducting on-net and off-net speed tests using the FCC portal at <http://www.broadband.gov/qualitytest/about/> or using the Ookla Net Metrics enabled speed test utility located on each of Connected Nation's state specific websites.

Additionally, Connected Nation cross-referenced numerous public documents in order to ensure that all known broadband providers were located and contacted. This included searching membership logs from the trade associations (WISPA, WCAI, PCIA, etc.), the Cable Television Fact Book, Public Utility Commission records, Public Service Commission records, Chamber of Commerce, etc.

To date Connected Nation's staff conducted on-site validation tests in Tennessee on the following providers: Ardmore Telephone Company Inc., AT&T, Beasley Wireless, Ben Lomand Rural Telephone Cooperative Inc., Big River, Cellular South Inc., Clearwire Corporation, Columbia Power & Water Systems, CRU Enterprises, DotSpot Wireless, ECSIS.Net, Frontier Communications Corporation, High Country Online, Jackson Energy Authority, Ken-Tenn Wireless LLC, Leap Wireless International Inc., Millington Telephone Company, NetEase, NewWave Communications, Planet Connect Internet, QuickRelay Wireless Communications, Sprint. TEC of Jackson Inc., T-Mobile USA Inc., Trenton Cable TV Company, U.S. Cellular, UltraNet, Verizon Communications Inc. and Xpansion Networks.

From program initiation through this reporting period, Connected Nation has completed in-the-field validation testing against 30 companies (out of a universe of 90 viable providers) totaling 33.33% within the State of Tennessee.

ACCURACY AND VERIFICATION: METHODOLOGY - PROVIDER VALIDATION

Broadband providers maintain their service area data in many different formats, all in varying levels of complexity and granularity. In order to ensure that the data required by the NTIA is standardized across all providers and that it is as accurate as possible, Connected Nation translates and formats the data that providers are able to supply into a GIS shapefile and produces maps for the provider to review. The resulting map(s) and review process allow for providers to see their service area in a geographic format – for some providers, this is the first time they have seen maps of their broadband service area. Having the mapped service area allows providers to quickly identify any issues that appear in the data representation, whether the issue is in the data translation into a GIS format or from the original data collection and submission. Often data is provided from various

sources and through the review and revision process, local engineers who operate the networks and work in the field are able to ensure that the tabular data that has been submitted is accurate and represents the real-world network extent. Any issues in how the service area is represented on the map(s) are remedied by Connected Nation, whether they are additions, removal of service, or any other revisions. Revised maps of service area representations are sent to the provider for review and approval; Connected Nation will revise data and return maps as many times as necessary until the provider is in agreement that the map represents their service area as accurately as possible. Once the review process has been completed and final approval of the data is provided, the data is deemed ready for NTIA submission.

Once the data collection has been aggregated at a statewide level, static maps of statewide and county-level availability are produced and made publicly available. In addition, consumers can visit the interactive online tool, BroadbandStat, to create customized views of broadband service areas and analyze corresponding demographic information. Leveraging broadband service data on various platforms allows for public users, providers, and other stakeholders to review, scrutinize, and provide feedback on the represented data. This feedback becomes a validation method in itself as consumers submit inquiries to Connected Nation either affirming where service is not available or identifying areas where broadband service is shown on the map, but in actuality is not available. This allows for a follow-up to providers regarding revisions to the data as it is represented; it also allows for Connected Nation to identify locations where on-site visits may be necessary to complete field validation of available services. Public feedback on all forms of mapping products serves as a localized validation method for provider-supplied information and allows Connected Nation to resolve inaccuracies as they are identified to ensure that only the highest quality information is provided to stakeholders.

Estimates derived from provider-validated data indicate that approximately 4.94% of Tennessee households do not have terrestrial fixed broadband service available, and approximately 0.42%¹ of Tennessee households have neither mobile nor fixed broadband service available.²

Within rural areas of the state, results derived from provider-validated data indicate that approximately 9.07% of rural Tennessee households do not have terrestrial fixed broadband service available, and approximately 0.83%³ of rural Tennessee households have neither mobile nor fixed broadband service available.⁴

¹ In accordance with NTIA's definition of available broadband service as specified in the SBDD NOFA, this estimate includes both terrestrial fixed *and* mobile broadband service, if the service offers download speeds of at least 768 Kbps and upload speeds greater than 200 Kbps.

² Due to the nature of the SBDD data collection methodology as defined by the NTIA and based on both census block geographic units and street segment data, the estimates of broadband availability derived from provider-validated data may include an overstatement of the actual number of households with broadband availability. Under the census block-based data collection method, a provider will typically report broadband availability for an entire census block whether its network is present across the whole or only a subset of that census block. This potential overestimation at the census block level can be amplified as the data is aggregated across the entire state.

³ See footnote 1.

⁴ See footnote 2.

WIRELESS METHODOLOGY

Broadband Service Availability in Provider's Service Area Wireless Services Not Provided to a Specific Address

Data solicited from a fixed wireless provider to create propagation models include, but are not limited to:

1. The name of the structure
2. Whether the transmitting device is operational or proposed
3. The maximum advertised downstream speed, the maximum advertised upstream speed
4. The typical downstream speed, the typical upstream speed (peak periods for both)
5. The frequency range of spectrum being used (as prescribed by NTIA)
6. The primary population center(s) being served (for geopolitical boundary reference)
7. The physical address of the transmit site (in the event latitude/longitude is unavailable from the provider this allows a quick reference point for geocoding)
8. Latitude in either Degrees, Minutes and Seconds and/or in Decimal Degrees (typically received as NAD 27 or NAD 83)
9. Longitude in either Degrees, Minutes and Seconds and/or in Decimal Degrees (typically received as NAD 27 or NAD 83)
10. Antenna pattern (e.g. omni-directional, 180°, 120°, 90°, etc.)
11. Azimuth of antenna (e.g. 360° with magnetic declination if known)
12. Approximate transmit radius (in feet, miles, or kilometers)
13. Polarity of transmit antenna (Vertical or Horizontal)
14. Transmit antenna gain (in dBi)
15. Line loss (applicable only to providers using coax, heliax, waveguide or other forms of cabling – excludes power-over-Ethernet devices)
16. Mechanical and/or Electrical beam tilt (if applicable)
17. Equipment Manufacturer (allows easy cross-reference against manufacturer's specification sheet)
18. Power output of the transmitting device (if unknown, FCC standards or manufacturer specifications are applied)
19. AMSL at base of tower site
20. Antenna centerline AGL (height of antenna above ground level measured at the centerline of the actual antenna)
21. Foliage factors (Evergreens/Deciduous and percent of ground cover)
22. Ground Clutter (primarily used in rural areas to account for foliage and in metropolitan areas to account for types and heights of buildings if known)
23. Average gain of receive antenna
24. Receive antenna is estimated at height above average terrain (HAAT) of 6.2 meters/20 feet

25. Federal Registration Numbers (if applicable) which may allow opportunities to cross-reference and/or obtain additional data from the Federal Communications Commission Universal Licensing System and the **CO**mmission **RE**gistration **S**ystem

Propagation modeling is an empirical mathematical formulation for the characterization of radio wave propagation as a function of frequency, distance, and other conditions. Propagation software(s) typically use the Irregular Terrain Model (also known as Longley-Rice) of radio propagation for frequencies between 20 MHz and 20 GHz. This model is based on electromagnetic theory and statistical analyses of the combination of terrain features and radio measurements, then predicting the median attenuation of a radio signal as a function of distance and the variability of the signal in time and in space. For metropolitan areas, the software can typically be adjusted to use the Okumura-Hata model which accounts for predicting the behavior of cellular transmissions in areas where buildings are the primary obstructions. The resulting product from either model depicts a graphical illustration of the theoretical propagation characteristics of a selected frequency range based on defined variables (receiver sensitivity of the home/mobile device, foliage factor, and digital elevation terrain input).

BROADBAND INQUIRIES METHODOLOGY

Connected Nation collects consumer feedback in the form of broadband inquiries. These inquiries represent any type of communication received from the public regarding broadband service. Once broadband inquiries are received across the state, this information is overlaid with the broadband availability information which was collected through the SBDD program. This allows for a real-world comparison of the broadband landscape to the information received from broadband inquiries. Broadband inquiries are able to provide three types of information: 1) Residents who do not have broadband but want it. 2) Residents who have broadband but want a different provider. 3) Residents who do not have broadband, but the broadband inventory maps indicate that they do.

Through the collection of broadband inquiries, a visual demand for broadband is presented. This visualization allows Connected Nation the ability to validate broadband availability maps for accuracy. If residents within a region state that they are without broadband, but the broadband inventory maps show otherwise, this allows Connected Nation to approach the providers within that area in an effort to trim down their coverage to more accurately represent real-world availability on the ground. On the other hand, if there is a region in the territory in which broadband is not available, the broadband inquiries allow providers close to that region to see where they can successfully expand their broadband networks, leading to a high return on investment. In short, the higher number of inquiries leads to a higher level of certainty in regard to the broadband availability maps. Since the initial data collection and release of corresponding maps, feedback in the form of broadband inquiries has allowed Connected Nation to identify additional areas that are in need of field validation, which are scheduled as soon as possible. Additional information on field validation can be found in the Field Validation Narrative.

The broadband inquiry process has been implemented in each of the Connected Nation state programs with successful results. Altogether Connected Nation has received over 16,000 broadband inquiries since 2007, allowing the state programs to evaluate each inquiry for broadband demand and

data verification. These inquiries are continuously examined against current broadband availability, updated every six months, to determine if previously unserved households have been expanded to and can now receive broadband at their residence. This database of broadband inquiries has also allowed the Connected Nation state programs to aggregate demand in concentrated areas to show providers the exact locations where the population has made it clear that they would purchase broadband if it was made available to them. Providers in the states have responded to this process and have expanded to areas knowing that their investment will be worthwhile. Data verification methods have also proven successful, as the state programs have been able to show those inquiries that indicate the broadband service areas are misrepresented on the map to providers, who then verify where service cannot reach in regard to that residence(s). The broadband coverage in these states has been altered to create a more accurate map based on the inquiries submitted by the public.

During this reporting period, the Connected Tennessee project has received a total of 380 inquiries (1,263 grant inception to date). As more inquiries are submitted to Connected Tennessee, a more thorough validation of the broadband landscape can be performed, while also allowing providers to see which areas have a high demand for broadband adoption.

BROADBANDSTAT METHODOLOGY

BroadbandStat is an online, interactive mapping tool for viewing, analyzing, and validating broadband data. Developed through a partnership with ESRI, the market leader in geographic information system (GIS) software, BroadbandStat is a multi-functional, user-friendly way for local leaders, policymakers, consumers, and technology providers to devise a plan for the expansion and adoption of broadband.

First and foremost, BroadbandStat allows consumers to locate their residence and identify providers that offer broadband Internet service to that location. The interactive platform allows for users to build and evaluate broadband expansion scenarios using a wealth of data, including education and population demographics, broadband availability, and research about the barriers to adoption.

New functionality in BroadbandStat allows the consumer to provide feedback on the broadband data displayed on the interactive map. Through the collection of this feedback, a visual demand for broadband is presented. This visualization allows the Connected Nation state programs the ability to validate the broadband availability for accuracy. If residents within a region state they are without broadband, but the interactive map shows otherwise, this allows Connected Nation to approach the providers within that area in an effort to trim down their coverage to more accurately represent real-world availability on the ground.

The Connected Tennessee project launched BroadbandStat on February 10, 2010, and has received a total of 5,729 visits to date, of which 1,063 occurred this reporting period.

SPEED TEST METHODOLOGY

The 2,269 speed tests that are represented in the Connected Tennessee Speed Test Report during this reporting period (7,149 grant inception to date) are the result of a partnership between Connected Nation and Ookla Net Metrics. Utilizing this relationship increases the level of confidence in the data being collected and provides for a far greater sample size than could be collected by a single testing site.

Ookla owns and operates Speedtest.net, as well as develops and deploys speed tests, such as the Connected Tennessee speed test website, for partners around the world. This network of sites that is developed and run on its testing technology provides Ookla with a vast dataset that, due to the variability of geographic information collected across the varying speed test sites, is geocoded utilizing Geo-IP technology. This technology allows for tests to be geocoded to points of aggregation, typically larger nodes across provider networks. While there are hundreds of thousands of tests that have been conducted, the level of aggregation is only sufficient for county-level detail due to the test results being located at these larger nodes and not at an absolute location for each speed test.

In an effort to validate broadband data from the Connected Tennessee project, speed test information is collected throughout the state. Speed tests provide speed information on the path taken through all networks (a provider's network as well as additional networks) a local machine must connect to in order to reach the host test. The benefit of this collection of speed information is two-tiered. First, it allows for a comprehensive dataset of speeds, while also providing Connected Tennessee with the information on where broadband services are available. Second, unlike theoretical speed information which was received through the data collection process, the use of speed tests provide real-world information on the speeds that currently exist within the State of Tennessee.



Broadband Provider Log

| | |
|------------------------------------|-----|
| Complete | 92 |
| Non-Responsive/Refused | 10 |
| In Progress | 10 |
| Count of Datasets by Viable Status | 112 |
| Total Unique Providers Represented | 90 |

| Provider Name | Platform | Status | NDA Execution Date | Notes |
|--|-----------------|--|--------------------|---|
| Ardmore Telephone Company Inc | ILEC/CLEC | Data Added to Statewide Inventory | 2/16/2010 | |
| AT&T Inc. | ILEC/CLEC | Data Added to Statewide Inventory | 12/16/2009 | |
| AT&T Inc. | Mobile Wireless | Data Added to Statewide Inventory | 12/16/2009 | |
| Ben Lomand Rural Telephone Coop., Inc. | Fiber | Data Added to Statewide Inventory | 10/21/2009 | |
| Cable ONE Inc. | Cable | Data Added to Statewide Inventory | 12/7/2009 | |
| CenturyLink | ILEC/CLEC | Data Added to Statewide Inventory | 12/4/2009 | |
| Charter Communications Inc. | Cable | Data Added to Statewide Inventory | 12/15/2009 | |
| Clearwire Corporation | Mobile Wireless | Data Added to Statewide Inventory | 3/3/2010 | |
| Comcast Cable Communications, LLC | Cable | Data Added to Statewide Inventory | 12/7/2009 | |
| ECSIS.NET | Fixed Wireless | Data Added to Statewide Inventory | 10/29/2009 | |
| Electric Power Board for the City of Chattanooga | Fiber | Data Added to Statewide Inventory | | |
| Fayetteville Public Utilities | Cable | Data Added to Statewide Inventory | | |
| Frontier Communications Corporation | ILEC/CLEC | Data Added to Statewide Inventory | 1/22/2010 | |
| Leap Wireless International, Inc. | Mobile Wireless | Data Added to Statewide Inventory | 4/6/2010 | |
| MidSouth Satellite, LLC | Fixed Wireless | Data Added to Statewide Inventory | 7/7/2010 | |
| Millington CATV, Inc. | ILEC/CLEC | Data Added to Statewide Inventory | 10/19/2009 | |
| Millington CATV, Inc. | Cable | Data Added to Statewide Inventory | 10/19/2009 | |
| Monster Broadband, Inc. | Fixed Wireless | Data Added to Statewide Inventory | 11/6/2009 | |
| Planet Connect Internet | Fixed Wireless | Data Added to Statewide Inventory | | |
| Rural Tennessee Wireless Broadband (RTWB) | Fixed Wireless | Data Added to Statewide Inventory | 2/15/2011 | |
| Sprint Nextel Corporation | Mobile Wireless | Data Added to Statewide Inventory | 1/14/2010 | |
| T-Mobile USA, Inc. | Mobile Wireless | Data Added to Statewide Inventory | 1/8/2010 | |
| TDS Telecommunications Corporation | ILEC/CLEC | Data Added to Statewide Inventory | 1/27/2010 | |
| TDS Telecommunications Corporation | Fiber | Data Added to Statewide Inventory | 1/27/2010 | |
| United States Cellular Corporation | Mobile Wireless | Data Added to Statewide Inventory | 2/15/2011 | |
| Verizon Communications, Inc. | Mobile Wireless | Data Added to Statewide Inventory | 12/14/2009 | |
| Zito Midwest LLC | Cable | Data Added to Statewide Inventory | 2/17/2011 | [JAN-19-11 Daryl Coffey] Zito Midwest purchased Galaxy Cable. |
| DIECA Communications, Inc. | Backhaul | Backhaul Provider Only Processing Complete | 1/19/2010 | |
| Level 3 Communications, LLC | Backhaul | Backhaul Provider Only Processing Complete | 12/14/2009 | |
| MidSouth Satellite, LLC | Backhaul | Backhaul Provider Only Processing Complete | 7/7/2010 | |
| T-Mobile USA, Inc. | Backhaul | Backhaul Provider Only Processing Complete | 1/8/2010 | |
| TDS Telecommunications Corporation | Backhaul | Backhaul Provider Only Processing Complete | 1/27/2010 | |
| Zayo Group, LLC | Backhaul | Backhaul Provider Only Processing Complete | | |
| NTCH, Inc. | Mobile Wireless | Provider Gathering Data | | |
| TELE-PAGE Inc. | Fixed Wireless | Provider Gathering Data | 1/26/2010 | |
| Access Cable Television, Inc. | Cable | No Update to Provide | | |
| AT&T Inc. | Backhaul | No Update to Provide | 12/16/2009 | |
| Aurora Cable TV | Cable | No Update to Provide | 3/12/2010 | |
| Beasley Wireless | Fixed Wireless | No Update to Provide | 1/19/2010 | |
| Ben Lomand Rural Telephone Coop., Inc. | ILEC/CLEC | No Update to Provide | 10/21/2009 | |
| Bledsoe Telephone Cooperative Inc | ILEC/CLEC | No Update to Provide | 1/20/2010 | |
| BreezeAir.net | Fixed Wireless | No Update to Provide | 8/17/2010 | |
| Bristol Tennessee Essential Services | Fiber | No Update to Provide | 9/1/2010 | |
| Celina Cable Communications, Inc. | Cable | No Update to Provide | 1/15/2010 | |
| Cellular South, Inc. | Mobile Wireless | No Update to Provide | 4/12/2010 | |
| CenturyLink | Backhaul | No Update to Provide | 12/4/2009 | |
| Columbia Power & Water Systems | Cable | No Update to Provide | | |
| CRU Enterprises, Inc. | Fixed Wireless | No Update to Provide | 2/4/2010 | |
| DeKalb Telephone Cooperative, Inc. | ILEC/CLEC | No Update to Provide | 2/24/2010 | |
| DeltaCom, Inc. | Backhaul | No Update to Provide | 2/16/2010 | |
| ETC Communications, LLC | Cable | No Update to Provide | 10/14/2009 | |
| High Country Online LLC | Fixed Wireless | No Update to Provide | 3/4/2010 | |
| Highland Telephone Cooperative, Inc. | ILEC/CLEC | No Update to Provide | 3/14/2010 | |
| iGiles/DotSpot.Net | Fixed Wireless | No Update to Provide | 2/25/2010 | |
| Info-Ed Inc | Fixed Wireless | No Update to Provide | 2/9/2010 | |
| InfoStructure Inc. | Cable | No Update to Provide | 10/2/2009 | |
| Iris Networks | Backhaul | No Update to Provide | 1/5/2010 | |
| Jackson Energy Authority | Fiber | No Update to Provide | 3/17/2010 | |
| James Cable LLC | Cable | No Update to Provide | 1/11/2010 | |
| Ken-Tenn Wireless, L.L.C. | Fixed Wireless | No Update to Provide | 1/25/2010 | |
| Loretto Telephone Company, Inc. | ILEC/CLEC | No Update to Provide | 3/16/2010 | |
| Mediacom Southeast LLC | Cable | No Update to Provide | 1/12/2010 | |
| Morristown Utilities Commission | Fiber | No Update to Provide | 3/25/2010 | |
| NetEase | Fixed Wireless | No Update to Provide | 2/3/2010 | |
| NewWave Communications | Cable | No Update to Provide | 10/13/2009 | |
| North Central Communications | ILEC/CLEC | No Update to Provide | 2/5/2010 | |
| OnWav, Inc. | Fixed Wireless | No Update to Provide | 3/15/2010 | |
| Pickwick Cablevision, Inc. | Cable | No Update to Provide | | |
| Pulaski Electric System | Fiber | No Update to Provide | 12/30/2009 | |
| Skyline Telephone Membership Corporation | ILEC/CLEC | No Update to Provide | 2/2/2010 | |
| Skyline Telephone Membership Corporation | Backhaul | No Update to Provide | 2/2/2010 | |

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| Softek, Inc. | Fixed Wireless | No Update to Provide | 1/14/2010 | |
| Spirit Broadband | Cable | No Update to Provide | 3/29/2010 | |
| Sprint Nextel Corporation | Backhaul | No Update to Provide | 1/14/2010 | |
| Surfmore.Net, Inc. | Fixed Wireless | No Update to Provide | 1/25/2010 | |
| TEC of Jackson, Inc | ILEC/CLEC | No Update to Provide | 7/29/2010 | |
| TEC of Jackson, Inc | ILEC/CLEC | No Update to Provide | 7/29/2010 | |
| TEC of Jackson, Inc | ILEC/CLEC | No Update to Provide | 7/29/2010 | |
| TEC of Jackson, Inc | Backhaul | No Update to Provide | 7/29/2010 | |
| TEC of Jackson, Inc | Backhaul | No Update to Provide | 7/29/2010 | |
| Trenton TV Cable Company | Cable | No Update to Provide | | |
| Tullahoma Utilities Board | Fiber | No Update to Provide | | |
| tw telecom of tennessee, llc | Backhaul | No Update to Provide | 3/31/2010 | |
| Twin Lakes Telephone Cooperative Corporation | ILEC/CLEC | No Update to Provide | 1/14/2010 | |
| Ultratnet High-Speed Internet | Fixed Wireless | No Update to Provide | 2/23/2010 | |
| Wave2Wave Communications Inc. | Backhaul | No Update to Provide | 4/28/2010 | |
| West Kentucky Rural Telephone Coop Corp Inc | ILEC/CLEC | No Update to Provide | 1/7/2010 | |
| XO Communications, LLC | Backhaul | No Update to Provide | 2/12/2010 | |
| Clarksville Department of Electricity | Fiber | No Update Provided - Use Last Submission Data | | |
| OrbWireless.net | Fixed Wireless | No Update Provided - Use Last Submission Data | | |
| QuickRelay Wireless Communications | Fixed Wireless | No Update Provided - Use Last Submission Data | | |
| United Telephone Company, Inc. - TN | ILEC/CLEC | No Update Provided - Use Last Submission Data | 2/25/2010 | |
| Verizon Communications, Inc. | Backhaul | No Update Provided - Use Last Submission Data | 12/14/2009 | |
| TNets Internet | Fixed Wireless | Solicited Initial Data | | |
| United Telephone Company, Inc. - TN | Fiber | Solicited Initial Data | 2/25/2010 | |
| Wisper, LLC | Fixed Wireless | Solicited Initial Data | 2/22/2011 | |
| ABG Wireless, LLC | Fixed Wireless | Refused to Participate | | [FEB-14-11 Deanna Ward] Provider representative indicated that they did not want to participate. |
| Birch Communications, Inc. | ILEC/CLEC | Refused to Participate | | [JAN-11-11 Jill Lindgren] Provider has chosen not to participate. The main concern was more with the fact he does not want to divulge the information publicly on his speeds or coverage area. |
| Birch Communications, Inc. | Backhaul | Refused to Participate | | [JAN-11-11 Jill Lindgren] Provider has chosen not to participate. The main concern was more with the fact he does not want to divulge the information publicly on his speeds or coverage area. |
| TNWEB, LLC | ILEC/CLEC | Refused to Participate | | [FEB-03-11 Deanna Ward] E-mail received from provider asking not to be contacted again. |
| TNWEB, LLC | Fixed Wireless | Refused to Participate | | [FEB-03-11 Deanna Ward] E-mail received from provider asking not to be contacted again. |
| Trinity Communications LLC | Cable | Refused to Participate | | [FEB-16-11 Alyson Sumerford] Contacted provider by phone and was told, "put so much time into this last year and provided no fruits for my business. I have bigger things to worry about right now." |
| Endless Sphere Technology | Fixed Wireless | Non-Responsive to Multiple Attempts | 2/17/2010 | In addition to multiple contact attempts made between January 21, 2010 and September 1, 2010, six attempts were made during this submission period. |
| Knology of Tennessee, Inc. | Cable | Non-Responsive to Multiple Attempts | | In addition to multiple contact attempts made between August 18, 2009 and August 24, 2010, five attempts were made during this submission period. |
| Knology of Tennessee, Inc. | Backhaul | Non-Responsive to Multiple Attempts | | In addition to multiple contact attempts made between August 18, 2009 and August 24, 2010, six attempts were made during this submission period. |
| US LEC of Tennessee Inc. | Backhaul | Non-Responsive to Multiple Attempts | | Five contact attempts were made between August 31, 2010 and February 22, 2011. |
| DIECA Communications, Inc. | ILEC/CLEC | Other | 1/19/2010 | [FEB-18-11 Wes Kerr] Provider doesn't offer residential DSL, and the last mile data will not be included in the data submission. |
| DISH Network Corporation | Satellite | Other | 1/27/2010 | [MAR-09-11 Ashley Littell] Satellite data will not be submitted due to additional information being necessary to show where service is available in the state, rather than submitting the entire state boundary as serviceable area. |
| Global Crossing Telecommunications, Inc. | Backhaul | Other | | [FEB-17-11 Wes Kerr] Received word from a provider representative that they still have a Network Security agreement with several Federal agencies and cannot provide data at this time. |
| Hughes Network Systems, LLC | Satellite | Other | 2/5/2010 | [MAR-09-11 Ashley Littell] Satellite data will not be submitted due to additional information being necessary to show where service is available in the state, rather than submitting the entire state boundary as serviceable area. |

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| WildBlue Communications, Inc. | Satellite | Other | 1/8/2010 | [MAR-09-11 Ashley Littell] Satellite data will not be submitted due to additional information being necessary to show where service is available in the state, rather than submitting the entire state boundary as serviceable area. |
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