

OFFICIAL OCTOBER 2010 UPDATE SUBMISSION TO
THE NATIONAL TELECOMMUNICATIONS AND INFORMATION
ADMINISTRATION UNDER THE
STATE BROADBAND DATA AND DEVELOPMENT GRANT PROGRAM
FOR THE COMMONWEALTH OF PUERTO RICO



CONNECT
PUERTO RICOSM

October 1, 2010



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COVER LETTER

September 28, 2010

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:

As the State Broadband Designated Entity, the Puerto Rico Office of the Chief Information Officer (OCIO), in partnership with Connected Nation, is pleased to present this submittal of the Commonwealth of Puerto Rico’s State Broadband Data and Development (SBDD) Grant Program, known as Connect Puerto Rico.

These artifacts should be found to be compliant with the October 1, 2010, 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, Connect Puerto Rico: October 1, 2010

<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 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_CAInstitutions	Community Anchor Institutions-Listing

Appendix A: 4	n/a	Community Anchor Institutions- Narratives
VII.A.1(a) n/a	n/a DataPackage.xls	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 initial SBDD data submission for the Connect Puerto Rico program, on April 30, 2010. Specifically, these new requirements are:

Census Blocks

This dataset should be found to be in full compliance with the request to use Census 2000 geography with the availability of wireline broadband services in census blocks with an area of no greater than two square miles.

SBDD Data Transfer Model

The submission of the broadband dataset for October 1, 2010, is contained within the SBDD Data Transfer Model as released on the Grantee Workspace on September 9, 2010. All efforts have been made to comply with formatting, domain, and metadata requirements to include as much information on each provider as possible.

It is therefore with great pleasure that the Connect Puerto Rico program submits this first, 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 the gathering of comprehensive and accurate state-level broadband mapping data, developing state-level broadband maps, aiding in the development and maintenance of a national broadband map, and undertaking statewide initiatives for broadband planning.

As the submission of this semi-annual data update is concentrated on the delivery of Broadband Service Availability and Community Anchor Institutions (CAI) data, we provide the following insight into the compilation of these datasets contained herein.

Broadband Service Availability — Provider Outreach

This data update submission under the SBDD includes the participation of approximately 47.1% of the Puerto Rico provider community, or 8 of 17 total providers. Of the 8 participating providers, 4 supplied an update to their network or coverage area(s), while 2 have reported no change. The remaining 2 represents providers who supplied initial submission data but were non-responsive in the October 2010 update effort or could not verify coverage areas at the time of this submission; therefore their initial dataset is being put forward as part of this compilation. A complete roster by

provider depicting participation status and contact record is contained herein. The 9 providers that are not represented in the attached datasets 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 Connect Puerto Rico principals that all commercially reasonable efforts were made to account for 100% of the known Puerto Rico broadband provider community, pursuant to this semi-annual data update submission.

At the program's inception, Connect Puerto Rico launched a website to create awareness about the initiative. Connectpr.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. It is also noteworthy that a public webinar was conducted on September 17 to demonstrate the functionality of the interactive maps and share some of the strategic broadband initiatives in Puerto Rico. During the week of this webinar, the number of website hits increased 57.95% over the previous week and appears to remain elevated beyond the average. These program stakeholders are an essential component in the larger Connect Puerto Rico data validation methodology.

As an indicator of stakeholder penetration, the Connect Puerto Rico website encountered 1,442 unique visits during this reporting period, which includes 1,238 visits to the English website and 204 visits to the Spanish website (1,818 total to date for the life of the grant awarded on December 20, 2009, which includes 1,614 to the English website and 204 to the Spanish website). Additionally, this pronounced web activity netted 8 broadband inquiries over this same reporting period (8 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 Connect Puerto Rico website and offer the citizens a vehicle to provide information regarding availability in their respective service area, either in affirmation or contest of the reported data represented in the Connect Puerto Rico 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. Additional information on field validation can be found in the Field Validation Narrative.

Community Anchor Institutions

Connect Puerto Rico 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 Puerto Rico Office of the Chief Information Officer, significant additional research and outreach was conducted during this data update reporting period by Connect Puerto Rico to continue identification of existing, centralized sources for CAI connectivity data. Outreach was coordinated to distribute the CAI survey to institutions throughout the state. This coordination has resulted in the identification of key contacts at numerous statewide organizations including the Consejo General de Educación, Consejo de Educación de Puerto Rico, and Departamento de Salud – OIAT. The Puerto Rico Office of the Chief Information Officer assisted in the outreach effort by providing their contact information for their CAI partners. Connect Puerto Rico has identified and processed a list of CAI through a combination of datasets including publicly available and privately held datasets from online sources, including:

- Consejo de Educación Superior de Puerto Rico
<http://www.ces.gobierno.pr>
- The National Public Safety Information Bureau
<http://www.safetysource.com>
- American Hospital Association
http://www.hospitalconnect.com/hospitalconnect_app/hospitalfinder
- National Center for Education Statistics
Public Schools: <http://nces.ed.gov/ccd/schoolsearch/>
Private Schools: <http://nces.ed.gov/surveys/pss/privateschoolsearch/>
Colleges: <http://nces.ed.gov/collegenavigator>
Libraries: <http://nces.ed.gov/surveys/libraries/librarysearch/>
- United States Fire Administration
<http://www.usfa.dhs.gov/applications/census/search.cfm>

As of this semi-annual reporting period, a total of 58.9% Puerto Rico CAI were identified, addressed, and geocoded. As is evident in the datasets being conveyed, while we were able to document institutions and the related addresses, the connectivity data collected in most categories remains less than complete. From our work in Puerto Rico, as well as other states, we recognize the great value of this data to future collaboration efforts within the state, and to the accomplishment of the purposes in the recently released National Broadband Plan. We plan to continue to bring best practices to the Puerto Rico efforts, along with an investment of both human and technical resources required to reach these goals in advance of the submission of the semi-annual update of this data due in April 2011.

In acquiring both broadband availability and CAI data within the Commonwealth of Puerto Rico, Connected Nation made special effort to engage all federally recognized tribal lands in the area covered by the Puerto Rico SBDD grant. According to the U.S. Department of the Interior — Bureau of Indian Affairs, there are no federally recognized tribal lands in this area.



The Connect Puerto Rico 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 Commonwealth of Puerto Rico, as well as the United States through contribution to the National Broadband Map. We look forward to the remaining work ahead.

Respectfully submitted,

A handwritten signature in blue ink, appearing to read "Tom Ferree", written over a light blue circular stamp.

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

cc: Juan Eugenio Rodriguez de Hostos, CIO
Government of Puerto Rico

DATA ACQUISITION: PUERTO RICO COMMUNITY ANCHOR INSTITUTIONS

In this second reporting period of the SBDD, Connect Puerto Rico, working in close coordination with the Puerto Rico Office of the Chief Information Officer (OCIO) and the Puerto Rico Infrastructure Financing Authority (PRIFA), 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. Connect Puerto Rico has focused efforts during this reporting period on conducting outreach and raising awareness of this important project.

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

Connect Puerto Rico continues to utilize a customized online survey in both English and Spanish hosted through SurveyMonkey, with a landing page on Connect Puerto Rico's websites. The English survey was developed during the first reporting period; the Spanish survey was developed during the second reporting period in response to questions from institutions that primarily speak Spanish. Having the ability to reach institutions in both languages will allow Connect Puerto Rico to effectively target and communicate with a broader number of CAI in the commonwealth. Connect Puerto Rico 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.

English Survey Link:

http://www.connectpr.org/mapping/Community_Anchor_Institution_Data_Collection.php

Spanish Survey Link:

http://es.connectpr.org/mapa/recopilacion_de_datos_de_instituciones_comunitarias_ancla.php

The OCIO and Connect Puerto Rico have worked closely together during this reporting period to conduct research as part of an ongoing process to identify existing, centralized sources for CAI connectivity data. The research has resulted in the identification of databases within the commonwealth containing partial CAI connectivity data. In tandem with these efforts to identify existing data, Connect Puerto Rico is working 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. This coordination has resulted in the identification of key contacts at numerous statewide organizations including the Consejo General de Educación, Consejo de Educación de Puerto Rico, and Departamento de Salud – OIAT. Connect Puerto Rico also continues to operate a CAI hotline to answer questions related to the survey tools and CAI data collection.

Connect Puerto Rico has an ongoing mission to educate CAI throughout the commonwealth 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 Connect Puerto Rico interactive map.

The greatest challenge faced in both reporting periods continues to be the difficulty in securing CAI broadband connectivity data. Connect Puerto Rico will continue its ongoing work with Puerto Rico’s key CAI contacts in an effort to raise awareness of this project. Future efforts will involve targeted planning with representatives from each of the CAI categories, as well as a structured outreach to each category, supported by messaging and meetings showcasing the value of these data for planning and collaboration purposes. Targeted outreach efforts will be conducted through phone calls, industry/trade association meetings, and newsletters.

SBDD DATA TRANSFER MODEL METHODOLOGY

The submission of the broadband dataset for October 1, 2010, is contained within the SBDD Data Transfer Model as released on the Grantee Workspace on September 9, 2010. 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.

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 Commonwealth of Puerto Rico.

Inventory of Deliverables, Connect Puerto Rico: October 1, 2010

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The provider data collected by Connected Nation on behalf of the Commonwealth of Puerto Rico 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, middle-mile connections and community anchor institutions are contained as point data, and the subscriber weighted nominal speed (if available) is contained within the overview feature class. 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.

PUERTO RICO FIELD VALIDATION NARRATIVE

As of the date of this report several key milestones and indicators are worthy of mentioning in order for NTIA to have a better understanding of the provider landscape on the island of Puerto Rico.

Puerto Rico has an estimated Internet access penetration of less than 40% and a low degree of personal computer and technology literacy when compared to other jurisdictions in the United States. There is a relatively low degree of competition among Internet service providers, and constructing new infrastructure is costly due to Puerto Rico's mountainous topography and costs of shipping. The Connect Puerto Rico staff has identified 16 broadband providers (offering speeds of at least 768 kbps x 200 kbps) with 50% of those companies voluntarily contributing data for the augmentation of the State Broadband Data and Development Grant program. The Connect Puerto Rico staff has met with 6 of the 8 contributing providers (America Movil d/b/a Puerto Rico Telephone Company, AT&T, Data@ccess, Liberty Cablevision of Puerto Rico, PREPA Networks Corp., and Worldnet Telecommunications. Sprint Nextel and HughesNet have also submitted broadband data for the program).

On September 17, 2010, Connect Puerto Rico launched its fully interactive map (BroadbandStat) via webinar to an audience which included the island's broadband providers, government officials, representatives from Community Anchor Institutions, and consumers at large. Connect Puerto Rico was pleased with the launch as it allowed non-participating providers to view (and realize the immediate benefits of) this interactive mapping tool. As a result, discussions have commenced with 2 companies now wishing to participate and positive comments from the remaining 6 providers in Puerto Rico.

On-site meetings with the island’s providers, as well as Junta Reglamentadora de Telecomunicaciones de Puerto Rico, have begun to garner a new sense of trust and local support of the SBDD initiative. Forty-three field validation studies have occurred on 6 providers (35.29% of the provider community):

- **Mobile Broadband and 3G Wireless:**
 - **Location:** Carolina, Ponce, Salinas, Villalba, San Juan, Salinas
 - **Company:** AT&T Mobility
 - **Location:** Carolina, Ponce, Salinas, Arecibo
 - **Company:** Sprint Nextel

- **Backhaul:**
 - **Location:** San Juan
 - **Company:** Data@ccess Communications, Inc.
 - **Location:** Fajardo
 - **Company:** Worldnet Telecommunications

- **DSL:**
 - **Location:** Carolina, Ponce, Salinas, Villalba, Cespedes, Barceloneta
 - **Company:** Puerto Rico Telephone Company

- **Cable Modem:**
 - **Location:** Barceloneta, Arecibo, Fajardo
 - **Company:** Liberty Cablevision of Puerto Rico

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 to an island-wide level, static maps of island-wide and municipality-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.

DATA VALIDATION: SURVEY RESEARCH

Between August and September 2010, Connect Puerto Rico conducted a statistically significant telephone survey of 814 businesses, to offer as a comparison against the provider-validated island-wide broadband inventory. The survey provides an estimate of the percentage of all Puerto Rico businesses island-wide that report that they are unaware of available broadband service at their location. These figures are then compared against broadband availability estimates derived from provider-supplied data to provide a macro level comparison to the provider-validated data. This test measures how island businesses' awareness of broadband availability compares to provider-validated availability information. Results are reported below.

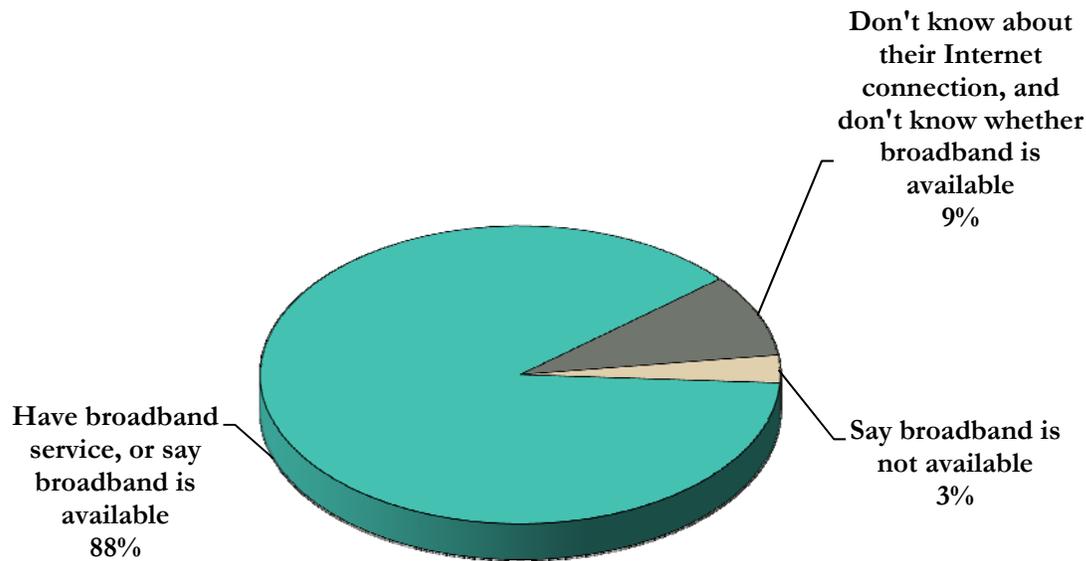
DATA VALIDATION: METHODOLOGY

Connect Puerto Rico conducted a random digit dial (RDD) survey of 814 businesses contacted between August 5 and September 3, 2010. Data were collected by telephone through live, computer-assisted interviews, with quotas set by business size and industry sector to ensure adequate representation of all businesses across the island. Weights were applied to correct for minor variations and ensure that the sample matched the U.S. Census estimates of the island's business establishments, as reported in their County Business Patterns Report. The island-wide full sample (n=814) provides a margin of error of $\pm 5.1\%$ at the 95% level of confidence. This sample error accounts for sample weighting, using the effective sample size. For the purposes of this survey, broadband is defined as "an Internet connection with speeds of 768 kilobits per second or higher in at least one direction." Due to the extremely low number of business establishments in rural municipalities, as defined by the U.S. Census, the sample of rural business establishments was too low to provide statistically significant results.

Results

Island-wide, 3% of businesses report that broadband service is not available at their location, 88% report with certainty that broadband is available, and 9% are unaware of their own broadband service or whether broadband service is even offered at their location (Figure 1).

Figure 1.
Awareness of broadband availability among Puerto Rico businesses



Taking into account the survey’s margin of error, the results estimate that between 0% and 8.1% of Puerto Rico businesses do not have broadband service available.

Estimates derived from provider-validated data indicate that approximately 8.34% of Puerto Rico households do not have terrestrial fixed broadband service available, and approximately 0.84%¹ of Puerto Rico households have neither mobile nor fixed broadband service available.²

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 island.

Results derived from provider-validated data indicate that approximately 12.76% of rural Puerto Rico households do not have terrestrial fixed broadband service available, and approximately 1.39%³ of rural Puerto Rico households have neither mobile nor fixed broadband service available.⁴ Since the total universe of business establishments in rural municipalities is so small, no comparable figure is available for rural Puerto Rico business establishments.

WIRELESS METHODOLOGY

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

Data is solicited from the wireless provider to include, but is not limited to:

1. The name of the structure
2. Whether the transmitting device is operational or proposed
3. The maximum advertised downstream speed and the maximum advertised upstream speed
4. The typical downstream speed and 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. Latitude in either Degrees, Minutes and Seconds and/or in Decimal Degrees (typically received as NAD 27 or NAD 83)
8. Longitude in either Degrees, Minutes and Seconds and/or in Decimal Degrees (typically received as NAD 27 or NAD 83)
9. 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)
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 manufacturers' specification sheet)
18. Power output of the transmitting device (if unknown FCC standards 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)

³ Ibid.

⁴ Ibid.

21. Foliage factors (evergreens/deciduous and percent of ground cover)
22. Ground clutter (primarily used only in metropolitan areas – accounts for types and heights of buildings)

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 typically uses 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, 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 island, 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, 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 several other Connected Nation state programs with successful results. Citizens in the State of Tennessee have submitted over 10,000 broadband inquiries since 2007, allowing the Connected Tennessee program to evaluate each inquiry for broadband demand and data verification. These inquiries are continuously examined against current broadband availability, updated every three months, to determine if previously unserved households have been expanded to and can now receive broadband access at their residence. This database of broadband inquiries has also allowed Connected Tennessee 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 state 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 Connected Tennessee has 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 Tennessee has been altered to create a more accurate map based on the inquiries submitted by the public.

During this reporting period, the Connect Puerto Rico project has received a total of 8 inquiries (8 grant inception to date). As more inquiries are submitted to Connect Puerto Rico, 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.

The Connect Puerto Rico project launched BroadbandStat on September 17 and has received a total of 145 visits to date.

SPEED TEST METHODOLOGY

The 198 speed tests that are represented in the Connect Puerto Rico Speed Test Report during this reporting period (247 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 Connect Puerto Rico speed test website, for partners around the world. This network of sites that is developed and run on their 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- or municipality-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 Connect Puerto Rico project, speed test information is collected throughout the commonwealth. 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. This collection of speed information is two tiered. First, it allows for a comprehensive dataset of speeds, while also providing Connect Puerto Rico 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 Commonwealth of Puerto Rico.



Broadband Provider Log

Complete	9
Non-Responsive/Refused	0
In Progress	9
Count of Datasets by Status	18
Total Unique Providers Represented	17

Provider Name	Platform	Status	NDA Execution Date	Notes
AT&T Inc.	Mobile Wireless	Data Added to Statewide Inventory	12/16/2009	
Liberty Cablevision of Puerto Rico, Ltd. #1	Cable	Data Added to Statewide Inventory	10/19/2009	
Sprint Nextel Corporation	Mobile Wireless	Data Added to Statewide Inventory	1/14/2010	
MCI Communications Services, Inc.	Backhaul	Backhaul Provider Only Processing Complete		
Sprint Nextel Corporation	Backhaul	Backhaul Provider Only Processing Complete	1/14/2010	
PREPA Networks Corp		No Update to Provide	4/21/2010	
Worldnet Telecommunications		No Update to Provide	4/19/2010	
America Movil S.A.B. DE C.V.		No Update Provided - Use Initial Data	4/23/2010	
Data@ccess Communications, Inc.		No Update Provided - Use Initial Data	9/29/2009	
Aeronet Wireless Broadband Corp.		Solicited Initial Data		
Ayustar Corp		Solicited Initial Data	7/12/2010	
Caribbean Internet		Solicited Initial Data		
Neptuno Networks, Inc.		Solicited Initial Data	4/29/2010	
Onelink Communications		Solicited Initial Data		
Orizon Wireless Corp		Solicited Initial Data		
Puerto Rico Cable Acquisition Company, Inc.		Solicited Initial Data		
Telefonica International Holding, BV		Solicited Initial Data		
Hughes Network Systems, LLC		Other	2/5/2010	[SEPT-16-10 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.