

**OFFICIAL OCTOBER 2013 UPDATE SUBMISSION TO
THE NATIONAL TELECOMMUNICATIONS AND INFORMATION
ADMINISTRATION UNDER THE
STATE BROADBAND DATA AND DEVELOPMENT GRANT PROGRAM
FOR THE STATE OF IOWA**



October 1, 2013

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October 1, 2013

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

Dear Ms. Neville:

As the State Broadband Designated Entity, in partnership with Iowa Economic Development Authority, please accept this submission from Connected Nation on behalf of the state of Iowa's State Broadband Initiative (SBI) Grant Program, known as Connect Iowa.

Truly, now more than ever, the significance of complete and validated data through this effort is impacting lives in communities all across our great country. The Connect Iowa program and its collective stakeholder community continue to be faithful and energized contributors, and we are proud to play such a part in forging the innovation economy of the twenty-first century.

The artifacts that comprise this submission should be found to be compliant with the October 1, 2013, 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 Iowa: October 1, 2013

<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	Accuracy and Verification Report
n/a	DataPackage.xlsx	Worksheets of Contact Information, Record Count, and Provider Summary Table
n/a	n/a	List of Changes and Corrections to the Dataset
n/a	n/a	Non-Participating Provider (NPP) Narratives
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 April 2013 SBI data submission for the Connect Iowa program. Specifically, these new requirements are:

SBI Data Transfer Model

The submission of the broadband dataset for October 1, 2013, is contained within the SBI Data Transfer Model as provided to SBI Grantees on June 26, 2013. 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

On July 8, 2013, the program office released an “unknown broadband speeds” report on school and library Community Anchor Institutions (CAI), identifying the percentage of those CAI types that are missing subscribed download speed data or the federal ID code (CAI ID). The distributed list generated much excitement and support from staff as well as state leaders committed to improving CAI numbers universally. This October 2013 submission has seen an increase in the number of federal ID codes reported.

In collecting broadband service area datasets for inclusion on the National Broadband Map, this October 2013 submission includes business/commercial broadband service areas in addition to the residential datasets that have been collected for the SBI program. Following guidance from the program office, the end user category appropriately delineates the differences in residential service area, business service areas, and combination residential/business service areas. Further, all contacted providers were asked if they

provide broadband services to business customer within their existing coverage areas and, if so, this information was noted.

This submission also includes information regarding the data and coverage estimation of a non-participating provider. While Connect Iowa continues outreach to all providers prior to each submission period, the need to submit broadband service data for all providers regardless of their participation is evident as the SBI program continues into this seventh round of data submissions. The submission of this estimated broadband service area for providers that have not supplied data to Connect Iowa is essential in being able to portray a more accurate depiction of the current broadband landscape.

This October 2013 semi-annual data update under the SBI Grant Program continues to demonstrate our dedication to implementing 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 SBI program includes datasets for 100 percent of the Iowa provider community, or 199 of 199 total providers. There are 198 participating providers and 1 additional non-participating provider whose estimated coverage areas have been submitted. Of the 198 participating providers, 45 supplied an update to their network or coverage area(s), while 136 have reported no change. The remaining 17 represent providers who previously supplied data but were non-responsive in the October 2013 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 history is contained herein.

New to this October 2013 submission is reporting on the number of business/commercial providers included in the broadband datasets. Of the 199 residential providers represented in the above section, 13 are providers that do not distinguish between serving primarily residential or primarily non-residential users (end user category 5). Three business-only providers (end user category 2) are also included in this submission.

In addition to the facilities-based and middle-mile broadband providers tracked above, this submission contains datasets for 3 resellers that were able to provide sufficient information on their service area(s) to be included in the data transfer model.

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

Connect Iowa has also continued to perform broadband verification activities through several means. In addition to confirmation of service area(s) by each provider, Connect Iowa conducts field

validation efforts. To date, 186 (92.08 percent) providers have been validated through field verification activities. Additional details on verification activities are contained within the Field Validation Methodology.

The Connect Iowa website (www.connectiowa.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 Connect Iowa website encountered 6,161 unique visits during this reporting period (37,391 total to date for the life of the grant awarded on January 1, 2010). Additionally, this pronounced Web activity netted 6 broadband inquiries over this same reporting period (243 grant inception to date). The website also provides access to the My ConnectView™ interactive mapping application, which allows consumers and broadband providers to confirm or dispute the coverage represented on the broadband inventory map. These consumer-initiated actions are facilitated through the Connect Iowa website and the Connect Iowa interactive mapping tool (My ConnectView™) that offer the stakeholders the vehicles to provide information regarding availability in their respective service area, either in affirmation or contest of the reported data represented in the Connect Iowa mapping artifacts. Since the initial data collection and release of corresponding maps, feedback in the form of broadband inquiries has allowed Connect Iowa to identify additional areas that are in need of field validation, which is scheduled as soon as possible.

Community Anchor Institutions

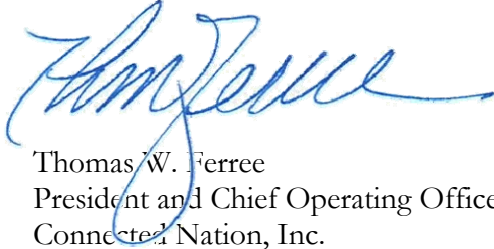
Connect Iowa remains committed to gathering data regarding the location and broadband connectivity of Community Anchor Institutions in accordance with the data requirements of the SBI NOFA Technical Appendix. The increased CAI data collection can be directly attributed to the “unknown broadband speeds” report received from the NTIA earlier this year. Multiple agencies and leaders have taken the opportunity to recommit to CAI data collection, reiterating the importance of a relationship-oriented approach with state-level agencies and organizations that generates more responses than local outreach.

In conjunction with the Iowa Economic Development Authority, outreach was conducted during this data update reporting period by Connect Iowa to continue identification of existing, centralized sources for CAI connectivity data. 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 Connect Iowa website. Building on the success of past campaigns to generate excitement about CAI outreach, research, and mapping, there have been two campaigns conducted since the previous NTIA data submission: Digital Learning (May 2013) and Education (August 2013). Connect Iowa has strengthened existing relationships with statewide associations to promote the importance of broadband connectivity at anchor institutions and participation in this data collection process. The value of these relationships continues to impact the entire success of the Grant Program, and the CAI engagement is a logical extension of new and existing relationships. Connect Iowa will continue to expand on these relationships over the coming months and utilize its contacts throughout the state to collect data and raise awareness of this project.

From our work in Iowa, as well as other states, we recognize the great value of this data to future collaboration efforts within the state as well as its value to the National Broadband Map. We plan to continue to bring best practices to the Connect Iowa 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 Connect Iowa 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 Iowa, as well as the United States and its territories through contribution to the National Broadband Map. We look forward to the continuing work ahead and improving upon our data collection methods.

Respectfully submitted,

A handwritten signature in blue ink, appearing to read 'Tom Ferree', written over the printed name and title.

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

IOWA COMMUNITY ANCHOR INSTITUTIONS METHODOLOGY

Connect Iowa remains committed to working with Iowa to gather data on the location and broadband connectivity of Community Anchor Institutions (CAI), in accordance with the data requirements of the SBI NOFA Technical Appendix. This commitment was further strengthened by the encouragement of NTIA to improve data numbers specifically in the K-12 school and library sectors. This encouragement translated very well with the state client as well as K-12 school and library points of contact. The impact will be seen in this submission as well as the upcoming April 2014 submission.

In addition to the encouragement from NTIA, Connect Iowa continues to promote sector-specific campaigns every quarter. Information received from these campaign outreaches is processed and compiled with all currently collected CAI data. Physical address information continues to be augmented through manual sourcing and geocoded by Connect Iowa through Esri ArcGIS software.

Connect Iowa continues to utilize a customized online survey hosted through SurveyMonkey, with a landing page on the Connect Iowa website that was developed during the first reporting period. This survey, in combination with a customized data-gathering spreadsheet, was distributed on a regular basis to a targeted list of CAI throughout the state as well as organizations and agencies that work closely with the CAI. The distributions were completed with the support of the state client. Connect Iowa 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 SBI NOFA.

The survey can be accessed at this link: <http://www.surveymonkey.com/s/RRZ9KHC>.

Connect Iowa realizes the value of key relationships, new and old, to promote the importance of broadband connectivity at Community Anchor Institutions and participation in this data collection process. It is apparent that these relationships are beneficial to the entire success of the grant program, and the CAI engagement is a logical extension of new and existing relationships. Connect Iowa will continue to build upon these relationships over the coming months and utilize its contacts throughout the state to collect data and raise awareness of this project.

In addition to fostering and building relationships with state agencies, associations, and organizations, Connect Iowa has also developed a sector-specific calendar that supports CAI outreach as well as research and communications efforts. This focused approach allows a corporate commitment to capturing CAI data in addition to developing meaningful sector-specific content. Since the April 2013 submission, the sector-specific approach included two month-long campaigns: Digital Literacy (May 2013) and Education (September 2013). During these campaigns, Connect Iowa committed to engage key stakeholders to educate them about the importance of our CAI data gathering efforts, distribute survey requests to sector representatives to gather CAI information, and provide campaign-specific education through communications and webinar resources. Continued outreach to and survey of schools, libraries, hospitals, local law enforcement, and fire stations helps build awareness and establishes a centralized database of key connectivity data for planning.

Connect Iowa conducts significant research as part of an ongoing process to identify existing, centralized sources for CAI connectivity data. In tandem with these efforts to identify existing data, Connect Iowa continues to identify key CAI contacts in an effort to distribute and promote the online survey and raise awareness of the importance of CAI broadband connectivity. Also, when possible, Connect Iowa works with the Iowa Economic Development Authority to identify existing relationships that can support CAI outreach.

Connect Iowa 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.

The greatest challenge with collecting CAI data continues to be educating the CAI about the Connect Iowa project as well as self-awareness of their own broadband connectivity (specifically upload and download speeds). Connect Iowa will continue to research key CAI organizations and agency contacts in an effort to raise awareness of this project among CAI. When applicable, the Iowa Economic Development Authority will continue to be briefed on the current CAI data and provided information so it can assist with outreach and promotion within the state.

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	1,888	1,888	1,874	193	759	757
Libraries	604	604	599	337	407	252
Healthcare	178	178	175	70	62	62
Public Safety	1,195	1,195	1,188	106	89	90
Higher Ed Institutions	107	107	104	31	31	31
Other Government	680	680	677	298	251	280
Other Non-Government	7	7	6	5	6	5
Total	4,659	4,659	4,623	1,040	1,605	1,477

Connect Iowa's CAI data witnessed a huge increase in the K-12 Schools sector due to a partnership with the Education SuperHighway. Education SuperHighway shared data for nearly 600 K-12 schools.

Additionally, efforts were made to increase the number of CAI IDs, or federal ID codes, submitted for K-12 school and library records. The K-12 schools now have 77.69% of the CAI IDs accounted for in the records, an increase of 289 since the April 2013 submission. Library records now have 93.99% of the CAI IDs accounted for in the records, an increase of 55 since the April 2013 submission; additional work will be completed prior to the April 2014 submission to further increase the number of CAI IDs submitted.

During the coming months, CAI data collection will be supported by regular reporting to the Connect Iowa team. The CAI data is proving an invaluable resource to all components of the Connect Iowa effort. The data identifies potential local champions, sector trends, and opportunities for improvement as well as opportunities to educate CAI not familiar with their current connectivity.

SBI DATA SUBMISSION METHODOLOGY

The submission of the broadband dataset for October 1, 2013, is contained within the SBI Data Transfer Model and additional components as provided to SBI Grantees on June 26, 2013.

Connected Nation (CN) 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, 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.

Connected Nation has complied with the following guidance documents published by NTIA:

- Technical Mapping Guide, as released on the Grantee Workspace on March 24, 2011, was 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.
- Naming Conventions and Category of End User, as released on the Grantee Workspace on March 26, 2012, was followed to ensure the consistency of individual file and zip package naming.
- Wireless Data Processing Guidance, as sent to SBI grantees on February 8, 2013, was followed to ensure that all fixed and mobile wireless provider coverage records are submitted to NTIA as separate, closed polygons whenever there is a variation in any of the required fields.

In addition to the methodologies contained herein, the Changes and Corrections documentation, 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 SBI Data Transfer Model for the state of Iowa.

Inventory of Deliverables, Connect Iowa: October 1, 2013

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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_CAInstitutions	Community Anchor Institutions-Listing.

The provider data collected by CN on behalf of the state of Iowa have been formatted per the given specifications and uploaded into the appropriate feature classes of the SBI 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.

In collecting broadband service area datasets for inclusion on the National Broadband Map, this October 2013 submission includes business/commercial broadband service areas in addition to the residential datasets that have been collected for the SBI program. Following guidance from the program office, the end user category appropriately delineates the differences in residential service area, business service areas, and combination residential/business service areas.

Connected Nation has continued outreach to satellite providers on their availability, technology, and speed information, but granular coverage is not yet available. Submitted within the wireless feature class are the satellite companies providing service to Iowa as a polygon of the state boundary. Efforts will continue to collect, process, or otherwise create more granular satellite data based on availability analyses and guidance received from NTIA. Process development continues as well to be able to create more granular satellite coverage based on satellite equipment positioning and geographic inputs; more granular satellite service areas should appear in the April 2014 submission.

DATASETS FOR IN-KIND MATCH

Connect Iowa received a listing of Community Anchor Institution (CAI) addresses and technology data from the Iowa Communications Network as part of an in-kind match contribution to assist Connect Iowa with its mapping and planning goals - \$25.

IOWA FIELD VALIDATION METHODOLOGY

CN 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 & Trips*;
- locating physical wire-line attributes (such as Central Offices, 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 CN's program specific websites.

Additionally, CN cross-referenced numerous public documents in order to ensure that all known broadband providers were located and contacted. This included searching membership logs from 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 has conducted on-site validation tests in Iowa on the following providers: Ace Telephone Association; Algona Municipal Utilities; Alliance Communications; Alpine Communications; Ambercomm; Arcadia Telephone; AT&T Inc.; Atkins Telephone; Aventure Communications; Ayrshire Farms Mutual Telephone Company; BEVCOMM; Bitwind Communications LLC; Brooklyn Mutual Telecommunications Cooperative; Butler-Bremer; Cable ONE Inc.; Casey Mutual Telephone Company; Cedar Falls Utilities; Central Scott Telephone; CenturyLink (acquired Qwest Corporation); Chat Mobility; Circle Computer Resources (d.b.a. Cramer IT); Citizens Mutual Telephone Cooperative; City of Hawarden; Clarence Telephone Company; Clear Lake Independent Telephone; Clearwire Corporation; CML Telephone Cooperative Association of Meriden, Iowa; Colo Telephone Company; Communications 1 Network; Community Cable Television Agency of O'Brien County; Community Digital Wireless; Complete Communication Services; Coon Rapids Municipal; Coon Valley Cooperative Telephone; Cooperative Telephone Company; Cooperative Telephone Exchange; Cornbelt Telephone; Cumberland Telephone; Danville Mutual Telephone Company; Dumont Telephone; East Buchanan Telephone Cooperative; Ellsworth Cooperative Telephone Exchange; Evertek Enterprises; Farmers & Merchants Mutual Telephone Company; Farmers Cooperative Telephone Company-Dysart; Farmers Mutual Cooperative Telephone Company – Harlan; Farmers Mutual Telephone Company-Jesup; Farmers Telephone Company-Essex (also d.b.a. Heartland Net); Farmers Mutual Telephone of Stanton; Fenton Co-Op Telephone Company; FiberComm LC; Frontier Communications Corporation; Goldfield Access Network; Grand Mound Cooperative; Grand River Mutual Telephone Corporation; Griswold Cooperative Telephone; Grundy Center Municipal Utilities; Harlan Municipal Utilities; Hickory Tech; Hospers Telephone Exchange; Hubbard Cooperative Telephone Association and Cable; Huxley Communications Cooperative; I-35 Telephone Company; IAMO Telephone Company; ImOn Communications; Internet Consulting Services LLC; Internet

Solver, Inc.; Iowa Connect Inc.; Iowa Network Services; Iowa Telecom Service Inc.; JAB Wireless (formerly d.b.a. KeyOn Communications, Dynamic Broadband, NetConX and Prairie iNet); Jefferson Telephone Company; Junction Telephone; Kalnet; Kalona Cooperative Telephone Company; KDSC Inc.; Killduff Telephone; La Motte Telephone Company Inc.; LaPorte City Telephone Company; Laurens Municipal Communications Utility; Leap Wireless International; Lehigh Telephone; Lenox Municipal Utilities; LoganNet; Lone Rock Cooperative Telephone Company; Long Lines; Lost Nation-Elwood Telephone Company; Mabel Cooperative Telephone; Mahaska Communications Group; Manning Municipal; Marne and Elkhorn Telephone; Martelle Telephone; Massena Telephone Company; MCC Iowa (d.b.a. Mediacom Iowa LLC); Mediapolis Telephone Company; MidIowa Net; Miles Cooperative Telephone Association; Milford Cable TV Inc.; Minburn Communications; Minerva Valley Telephone Cablevision, Inc.; Monarc Technologies; Muscatine Power & Water (d.b.a. MachLink); Mutual Telephone Company; Mutual Telephone Company of Morning Sun Iowa; Nexgen Integrated Communications, LLC; New Ulm Telecom, Inc.; Northern Iowa Telephone Company; Northwest Telephone Company; Ogden Telephone Company; OmniTel Communications; Osage Municipal Communications Utility; Palmer Telephone; Panora Communications Cooperative; Partner Communications Cooperative; Peoples Telephone; Premier Communications; Radcliffe Telephone Company, Inc.; Readlyn Telephone; Reasnor Telephone; RingTel Communications; River Valley Telecommunications Cooperative; Rockwell Cooperative Telephone Association; Royal Telephone Company; Ruralwaves Wireless Internet; Sac County Mutual Telephone; Scranton Telephone Company; Sharon Telephone Company; SpeedNet LLC (d.b.a. Speed Connect); Spencer Municipal Utilities; Sprint Nextel Corporation; Sully Telephone Association; Superior Telephone Cooperative; Swisher Telephone; Templeton Telephone Company; Terril Telephone Cooperative; Titonka Telephone; T-Mobile USA; Traer Municipal Utilities; U.S. Cellular; USA Communications (d.b.a. Farmers Mutual Telephone Cooperative-Shellsburg); Van Buren Telephone Company Inc.; Verizon Communications Inc.; Villisca Farmers Telephone Company; Walnut Telephone Company; Webb Dickens Telephone Corporation; Webster-Calhoun-Cooper Telephone Association; Wellman Cooperative Telephone Association; West Liberty Telephone Company (also d.b.a. Cloudburst 9 LLC and Liberty Communications); Western Iowa Networks; Western Iowa Telephone Association; WideOpenWest Finance, LLC; Windstream (d.b.a. Iowa Telecom Services); Winnebago Cooperative Telecom Association; Woolstock Mutual Telephone; and WTC Communications, Inc.

From program initiation through this reporting period, CN has completed in-the-field validation testing against 186 companies (out of a universe of 202 viable providers) totaling 92.08 percent within the state of Iowa. This percentage also considers the non-participating provider record submitted to NTIA as may be contained herein (see “Data Submission and Coverage Estimation of Non-Participating Provider” below).

CN has also continued to review provider datasets for accurate speed information, platform listings, and other intricacies that may fall outside of the standard SBI Data Transfer Model parameters, as included with the submission materials provided to grantees on June 26, 2013. Any providers whose submitted coverage and attributes are anticipated to come into question have been further reviewed and confirmed; details on a case-by-case basis are presented below.

Coon Rapids Municipal Communications Utility (Business Only)

Issue: Technology of transmission code 41 with maximum advertised download and upload speeds in tier 8, higher than expected value range for the technology.

Resolution: Provider confirmed that CRMU offers speed tier 8 and uses cable modems that are DOCSIS 1.0 & 2.0 at this time.

Farmers Mutual Telephone – Nora Springs


Issue: Technology of transmission code 40 with maximum advertised download speed in tier 8, lower than expected value range for the technology.

Resolution: Provider confirmed that they offer tier 8 speeds on DOCSIS 3.0.

Mediacom Communications Corporation

Issue: Technology of transmission code 40 with maximum advertised download speed in tier 8, lower than expected value range for the technology.

Resolution: Provider website advertises 30 Mbps download speed; screenshot below.



Prime Plus*

↓ Download speed: up to **30 Mbps***

↑ Upload speed: up to **2 Mbps**

Monthly Usage Allowance: **350 GB†**

Prime Plus is a super speedway for multiple tasks that require speed and more broadband capacity. It's the ideal speed for gamers who need to respond fast, and households with multiple users and multiple devices. Prime Plus 30 Mbps is available in Mediacom digital markets, and consists of download speeds of up to 20 Mbps in other areas.

Osage Municipal Utilities

Issue: Technology of transmission code 41 with maximum advertised download speed in tier 8, higher than expected value range for the technology.

Resolution: Provider website advertises 25 Mbps service; screenshot below.

Speed	Residential	Business
Lite (1 mbps/512 kbps)	\$29.95	\$29.95
Plus (10/2 mbps)	\$45.95	\$55.95
Premium (15/4 mbps)	\$65.95	\$75.95
Extreme (25/10 mbps)	\$99.95	\$249.95

WideOpenWest Finance, LLC.

Issue: Technology of transmission code 40 with maximum advertised download speed in tier 8, lower than expected value range for the technology.

Resolution: Provider website advertises 25 Mbps service; screenshot below.

25/30 Mbps

The optimal choice for multi-user households, frequent gaming, regular video streaming and file sharing. (5 Mbps upload)

DATA SUBMISSION AND COVERAGE ESTIMATION OF NON-PARTICIPATING PROVIDER (NPP)

As part of its ongoing broadband mapping efforts, CN has developed a series of processes with the goal of submitting coverage estimation mapping data to NTIA for every known and qualifying last-mile broadband provider, regardless of platform type (cable modem, DSL, fixed wireless, etc.).

The section below provides a summary of the status of CN's outreach and findings on all non-participating provider coverage for the October 2013 SBI submission.

Rural Waves

The coverage estimation for Rural Waves was not updated from the previous submission in April 2013. The full white paper containing the most recent coverage estimation for this provider can be found within the October 2012 submission to NTIA.

CONNECTED NATION SATELLITE BROADBAND FIELD TESTING REPORT

Connected Nation's Engineering and Technical Services (ETS) team has two main objectives in validating a provider's broadband service: 1) confirm the provider's presence in the target testing area, and 2) confirm that the provider's Internet service meets or exceeds the required minimum broadband speed.

Over the past three years, attempts to use any of our tailored validation techniques for satellite validation proved futile as the basic tools for validating other platforms do not exist for satellite. For example, residential satellite equipment for broadband is difficult to distinguish from satellite video gear as viewed from the street. Further, a satellite installer can serve several counties, and may not have a retail presence. As a result, confirming the presence of a specific satellite provider in any targeted community has been challenging. In trying to confirm broadband speeds, historically slow speeds and high latency on the satellite services have also prevented this level of validation.

The ETS team recently devised an approach to confirm both presence and speed by deepening the desk-top research in advance of field validation, accessing controlled use of satellite testing equipment, and leveraging CN's rich database of broadband inquiries.

Through on-line research, CN was able to identify multiple dealers authorized to install specific satellite services throughout the state. By doing so, the presence of a satellite broadband provider could be confirmed in certain areas of the state and rejected in others. By working with satellite provider representatives and obtaining the temporary use of satellite broadband equipment, CN technicians were then able to transport the satellite equipment to targeted testing areas, connect and engage the equipment, and perform validating speed tests. As a further effort, CN was also able to enlist the participation of satellite broadband users to conduct speed tests on the CN's state websites. See Appendix B for the complete report and test results on this validation methodology.

PROVIDER VALIDATION METHODOLOGY

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, CN 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 CN, 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; CN 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. However, if approval is not received from a provider in time for the submission, but CN believes the new/updated service area to be accurate, then the coverage will be submitted to NTIA without final provider approval with a note regarding the situation made in the provider log.

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, My ConnectView, 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 CN 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 CN 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 CN to resolve inaccuracies as they are identified to ensure that only the highest quality information is provided to stakeholders.

Additionally, non-participating provider narratives that were submitted in previous mapping cycles are subjected to the same level of scrutiny. Occasionally, a provider may elect to voluntarily participate (thus eliminating the need for future data estimation activities in the field). However, more often than not, the NPP narrative is updated with a combination of data gleaned from the provider's website, data obtained through FCC research, and/or data collected/verified in the field by a CN staff engineer.

Estimates derived from provider-validated data indicate that approximately 1.74 percent of Iowa households do not have terrestrial fixed broadband service available, and approximately 0.01 percent of Iowa households have neither mobile nor fixed broadband service available.

Within rural areas of the state, results derived from provider-validated data indicate that approximately 3.14 percent of rural Iowa households do not have terrestrial fixed broadband service available, and approximately 0.01 percent of rural Iowa households have neither mobile nor fixed broadband service available. Please note that the availability estimates presented are based on Census 2010 household information.

The estimates above, in accordance with NTIA's definition of available broadband service as specified in the SBI NOFA, include broadband service with download speeds of at least 768 Kbps and upload speeds greater than 200 Kbps.

In addition, due to the nature of the SBI 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.

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). This may include (but is not limited to) spectrum authorizations identified within the Federal Communications Commission (FCC) Universal Licensing System (ULS) database or located on the FCC's Spectrum Dashboard. This research often proves to be exceptionally effective when estimating the coverage area of an NPP.
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. omnidirectional, 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 FCC's ULS and the **CO**mmission **RE**gistration **S**ystem.

Propagation modeling combines scientific data and 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).

After converting propagation models into a geospatial format, additional processing is completed to remove the small pixels representing service present in the resulting dataset. These areas are initially created based on the parameters entered in the software from the provider equipment information, the underlying data parameters of elevation, hill shade, etc., and the limitations of the software itself to display a broadband service area as accurately as possible. Generally, these random pixel striations appear as a result of signal levels reaching the highest elevated points within the prescribed radius. Typically, while this pixilation anomaly shows legitimate areas where signals can be received, these highly elevated points may have exceedingly sparse populations or are entirely void of population. As a result, and congruent to the *Wireless Technology Methodologies and Business Logic* white paper submitted to NTIA on January 20, 2011, all independent pixels representing service that are less than 0.125 square miles in area have been removed from the geospatial representation of each wireless provider.

BROADBAND INQUIRIES METHODOLOGY

CN collects consumer feedback in the form of broadband inquiries (BBIs). These inquiries represent any type of communication received from the public regarding broadband service. Once BBIs are received across the state, this information is overlaid with the broadband availability information which was collected through the SBI program. This allows for a real-world comparison of the broadband landscape to the information received from broadband inquiries. Consumers submitting these inbound comments and/or inquiries are able to provide information regarding five categories: 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; 4) residents who have broadband but want a faster connection speed; and 5) residents who have broadband but want a less expensive service option.

BBIs are submitted frequently by consumers via the Connect Iowa website. Inquiries often seek help to identify local broadband provider options, or to learn when a specific provider may be able to provide service to that consumer. Consumer comments also provide information which may help modify maps with actual service area information. The primary objectives of CN regarding these inquiries are 1) to improve the accuracy of the state maps with submitted consumer information and follow-up field research; 2) to provide broadband options to consumers through cooperation with mapped providers and by facilitating new broadband service options; and 3) to map and analyze information from consumers about areas of unmet broadband demand and alternatives to currently mapped services. A prime example of the second option is the utilization of the Rural Utility Service satellite eligibility tool. By simply entering the consumer's address, the CN engineer can quickly determine if the consumer meets the initial qualification status for BIP satellite subsidies.

New BBIs are assigned to either the GIS department or the Engineering & Technical Services (ETS) team depending on the category entered by the consumer on the website submission form. The GIS or ETS team members respond to each inquiry according to the information entered by the consumer. Many BBIs can be resolved through desktop research; however, if a BBI requires

research in the field, the assigned ETS team member conducts such research when performing field validations in the area of the inquiry, or at another such time as is practical and appropriate. GIS and ETS team members respond to and conclude BBIs via telephone contact and/or e-mail communication.

The broadband inquiry process has been implemented in each of the CN state programs with successful results. Altogether CN has received over 18,996 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 CN 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 Connect Iowa project has received a total of 6 inquiries (243 grant inception to date). As more inquiries are submitted to Connect Iowa, 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.

MY CONNECTVIEW METHODOLOGY

My ConnectView is an interactive online mapping tool for viewing, analyzing, and validating broadband data. Developed using Esri's ArcGIS for Server and Adobe's Flex Framework and hosted and maintained by Connected Nation, My ConnectView 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, My ConnectView 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 several coverage analysis layers, speed analyses, Community Anchor Institutions, and tools to search and export household demographic information, as well as extract data in GIS, spreadsheet, and/or PDF formats.

My ConnectView also features more interactive data layers and additional tools than ever before to allow the consumer to explore the broadband data. My ConnectView provides consumers with the ability to print, e-mail, and 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 CN 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 CN 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 Connect Iowa project launched My ConnectView on April 2, 2012, and has received 1,505 visits this reporting period; to date the interactive mapping application has received 10,830 visits.

SPEED TEST METHODOLOGY

The 811 speed tests that are represented in the Connect Iowa Speed Test Report during this reporting period (6,498 grant inception to date) are the result of a partnership between CN 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 Iowa 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 Connect Iowa 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 Connect Iowa with the information on where broadband services are available. Second, unlike theoretical speed information which may be 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 Iowa.

PROVIDERS DEEMED NON-VIABLE

The following list of companies represents the remainder of the broadband provider universe that was originally identified as complete for outreach to begin for the State Broadband Initiative. These providers are not included in the Data Package for the October 2013 submission because they have been deemed non-eligible under the parameters and guidance of the SBI grant program. This list of companies includes, but is not limited to: providers offering service but below the current definition of broadband, those that have gone out of business, technology consulting firms, infrastructure or

network construction companies, non-facilities based general resellers that have not provided sufficient mapping information, etc.

	Company Name	URL	Comments
1	21Globe, Inc.	http://www.21globe.com/	Does not offer broadband services; not a broadband provider. Website works but not updated since December 2012.
2	360networks	http://www.360networks.com	Acquired by another company.
3	650Net	http://www.650net.net	Website references emergency food and power items.
4	A 007 Access	n/a	This company is a nonfacilities-based reseller.
5	AAA Internet Service	http://aaainter.net/dsl	Dial-up service with nonfacilities-based DSL.
6	Aaccess Network Communications	n/a	This company is not a broadband provider.
7	Access Media 3, Inc.	n/a	This company has no service offerings in Iowa.
8	ACERX.NET	http://acerx.net	Nonfacilities-based reseller of national and regional broadband companies with cable, DSL, and mobile wireless applications.
9	Affinity Wireless Solutions, LLC	n/a	This company was acquired by KeyOn Communications.
10	Airespring, Inc.	http://www.airespring.com/	This company is a nonfacilities-based reseller.
11	Airewaves Broadband, LLC	www.airewaves.com	Airewaves website is an audio-based web service; domain is listed as for sale.
12	AirNet	n/a	This company is no longer in business.
13	American Relay	n/a	This company is not a broadband provider.

14	Arrowheadnet.com	n/a	This company is not a broadband provider.
15	Bannon Communications	n/a	This company is not a broadband provider.
16	bargainisp.net	n/a	This company is not a broadband provider.
17	Barnes City Cooperative Telephone Company	n/a	This company is not a broadband provider.
18	Bel-Net Network Services	n/a	This company is no longer in business.
19	Broadband National	http://www.broadbandnational.com/	Nonfacilities-based reseller of national and regional broadband companies offering residential/business cable and DSL services.
20	BTC	n/a	This company was acquired by Western Iowa Networks.
21	Cable Television	n/a	This company is no longer in business.
22	Calhoun County Electric Co-Op	n/a	This company is not a broadband provider.
23	Camino-Net Internet Services	http://www.camino-net.com	Website is redirected to http://www.mytechproservices.com/ offering ancillary (not broadband) services.
24	Cannon Valley Telecom, Inc.	n/a	This company does business in MN.
25	Celito Communications	n/a	This company has no service offerings in Iowa.
26	cFree Wireless Network	n/a	This company is no longer in business.
27	CFY-CyberNet	n/a	This company is doing business as Cedar Falls Utilities.
28	City of Brookings Telephone Fund	http://www.swiftel.net/	This company is a nonfacilities-based reseller of Sprint.
29	Cleartouch.Com	n/a	This company is no longer in business.

30	Com Link	n/a	This company is no longer in business.
31	Comelec Services, Inc.	n/a	Acquired by another company.
32	CommSpeed Iowa, L.L.C.	n/a	This company was acquired by SpeedNet, LLC.
33	Community Internet Service	n/a	This company is no longer in business.
34	Covad Communications	n/a	This company has no service offerings in Iowa.
35	CyberStorm Wireless	n/a	This company is no longer in business.
36	Deltaforce	n/a	This company is not a broadband provider.
37	deluxehost.com	http://deluxe-host.com	Company delivers web hosting services.
38	DGUI	n/a	This company is no longer in business.
39	Dial National	n/a	This company is no longer in business.
40	Dialer.net	www.dialer.net	England-based, international pay-as-you-go mobile wireless and hot spot reseller.
41	Digital Telecommunications, Inc.	n/a	This company is no longer in business.
42	DSL @ Interlync	http://www.interlync.com/	This company is a nonfacilities-based reseller.
43	DTS-NET.COM	http://www.dts-net.com/	Web-hosting and non-facilities based reseller.
44	Dura Cable	n/a	This company is not a broadband provider.
45	EarthLink Business	http://www.earthlinkbusiness.com/	This company is a nonfacilities-based reseller.
46	Farmers Telephone Company - Batavia	http://www.bataviatelephone.com	This company offers service but it is below the FCC definition of broadband.

47	Fast Dependable Access	n/a	This company is no longer in business.
48	Forbin Wireless	http://www.forbin.net/	This company offers service but it is below the FCC definition of broadband.
49	fyreSTORM Wireless	n/a	This company is no longer in business.
50	Global Crossing Telecommunications, Inc.	http://www.globalcrossing.com	Acquired by another company.
51	Hubwest	n/a	This company is not a broadband provider.
52	Hubwest Protected Networks LLC	n/a	This company is not a broadband provider.
53	I Spot ACCESS	n/a	This company is not a broadband provider.
54	IMGISP.NET	http://www.imgisp.net/	Domain name is for sale.
55	Incredible Networks	www.incredible-networks.com	Incredible Networks is an independent network engineering services business based in Adelaide Australia.
56	Indianola Municipal Utilities	n/a	This company is not a broadband provider.
57	Inercom Communications, Inc.	n/a	This company is no longer in business.
58	Interactiveinfo.com Inc.	n/a	This company does business in New York and has no service offerings in Iowa.
59	Inter-County Cable Company	n/a	This company is doing business as Brooklyn Mutual Telecommunications Cooperative.
60	Interlink LC	n/a	This company is no longer in business.
61	Iowa Cable and Telecommunications Association	n/a	This company is not a broadband provider.

62	Iowa City Telecommunications	n/a	This company is not a broadband provider.
63	Iowa Connect, Inc.	http://www.iowaconnect.com/	Acquired by another company.
64	IowaOne.net	n/a	This company is no longer in business.
65	IPNS	n/a	This company does business in Oregon and has no service offerings in Iowa.
66	iRadical	n/a	Could not locate any information on company.
67	i-rule.net	n/a	This company is no longer in business.
68	ISPartner.net	n/a	Could not locate any information on company.
69	Jenco Speed Web	n/a	This company offers fixed wireless in Ohio and has no service offerings in Iowa.
70	Knology of the Plains, Inc.	http://www.knology.com/	Acquired by another company.
71	LCSisp.com	http://www.lcsisp.com/index.cfm	Website no longer in service.
72	LightEdge Solutions, Inc.	n/a	This company is not a broadband provider.
73	Lightyear Network Solutions, LLC	http://lightyear.net/	This company is a nonfacilities-based reseller.
74	Local Link	n/a	This company has no service offerings in Iowa.
75	Longview Communications	n/a	This company has no service offerings in Iowa.
76	MainBoard	http://www.mainboard.cc/internet.htm	Website no longer in service.
77	Maine Cable and Wireless	http://www.maineableandwireless.com	Could not locate any information on company. Redirects to a "coming soon" website for Maine Culinary Workshop.

78	Manilla Telephone Company	n/a	This company was acquired by Farmers Mutual Telephone Cooperative of Harlan, IA.
79	Maple Leaf Networks	n/a	This company has no service offerings in Iowa.
80	Marcin Company	n/a	No longer in business; phone and website are both inactive.
81	Metropolitan Telecommunications Holding Company	n/a	This company is a nonfacilities-based reseller.
82	MFW Cable	n/a	This company is not a broadband provider.
83	Millenicom Inc.	http://www.millenicom.com/	Reseller of 3G and 4G mobile wireless services.
84	Nanomega.Com	www.nanomega.com	Website is listed on Go-Daddy as for sale.
85	NetAccess, Inc.	http://www.nas.net/	Canadian based ISP; does not offer service in U.S.
86	Netconnect	http://www.n-connect.net/	Acquired by another company.
87	NetConX, Inc.	http://www.netconx.net/wireless.shtml	Acquired by another company.
88	NetSpeed Online	http://www.netspeed-online.net	Website no longer in service.
89	New Century Telecommunications	n/a	This company is not a broadband provider.
90	New Edge Network, Inc.	n/a	Acquired by another company.
91	Northwest Internet Services	n/a	This company has no service offerings in Iowa.
92	Northwest ISP	n/a	This company is no longer in business.
93	One Communications Corporation	n/a	Acquired by another company.

94	Oneota Net	http://www.oneota.net/wirelessdsl.shtml	This company offers service but it is below the FCC definition of broadband.
95	OpenCom, Inc.	n/a	This company is a nonfacilities-based reseller.
96	OrbitCom, Inc.	n/a	This company is a nonfacilities-based reseller.
97	Overarch Broadband	n/a	This company has no service offerings in Iowa.
98	Pacific Internet Exchange	http://www.pie.us/	Website is for sale.
99	PAETEC Communications, Inc.	http://www.paetec.com/	Acquired by another company.
100	Prairie Communication	n/a	This company is no longer in business.
101	Prairie Fire Internet	n/a	This company is no longer in business.
102	Prairie iNet	http://www.prairieinet.net/	Acquired by another company.
103	PremoWeb	http://www.premoweb.com/about_us/contact_us.html	Website no longer in service.
104	Professional Computer Solutions	http://www.pcsia.net	This company offers service but it is below the FCC definition of broadband.
105	Quad-Cities Online Broadband Plus	n/a	This company is not a broadband provider.
106	RACOM	n/a	This company is not a broadband provider.
107	Rankin Communication Systems	n/a	This company is not a broadband provider.
108	RockRapids.net	n/a	This company is not a broadband provider.
109	S & S Wireless Internet	n/a	This company is no longer in business.
110	Siebring-Kruss Wireless	n/a	This company is no longer in business.

111	Simply Dialup A Metrogeek Company	http://www.simplydialup.com	Dial-up services and general reseller of DSL, satellite and cable modem.
112	SIRIS	n/a	This company is not a broadband provider.
113	Sling Broadband	n/a	This company has no service offerings in Iowa.
114	Sparkplug Central, Inc.	n/a	This company was acquired by Airband Communications.
115	Speakeasy DSL	n/a	This company is a backhaul provider and a general reseller of DSL; part of a 2010 merger between Covad, Megapath, and Speakeasy.
116	State Wireless	n/a	This company is not a broadband provider.
117	Support Corps of America	n/a	This company is no longer in business.
118	Surferz.Net	http://www.surferz.net	Website manager and developer.
119	T1 Shopper	http://www.t1shopper.com/	This company is not a broadband provider.
120	Total Access Networks, Inc.	http://www.totalaccess.net	Website no longer in service.
121	TRX, Inc.	n/a	This company is not a broadband provider.
122	TSISP.NET	www.tsisp.net	Website no longer in service.
123	Twin Rivers Valley	n/a	This company is no longer in business.
124	United Western Net	n/a	This company is no longer in business.
125	UNUM Telecommunications, Inc.	n/a	This company is no longer in business.
126	VPM Global Internet Services, Inc.	n/a	This company is a nonfacilities-based reseller.

127	WilTel Communications, LLC	n/a	This company was acquired by Level 3 Communications.
128	Wireless Roanoke, Inc.	n/a	This company is no longer in business.
129	wisbin	http://www.wisbin.com	Reseller of DSL Internet service in Wisconsin.
130	WispAir	n/a	This company is no longer in business.
131	www.AmericanAngel.us	http://www.americanangel.us	Website no longer in service.
132	YEEZOO.NET	http://t1.vedy.net	Provider appears to no longer be in business.
133	YLISP (Your Local ISP)	http://www.itsyournet.com	Redirects to https://www.securepaynet.net - website and indicates for sale.
134	YourT1Wifi.com	n/a	This company has no service offerings in Iowa.

APPENDIX A: BROADBAND PROVIDER LOG



Broadband Provider Log

Complete	369
Non-Responsive/Refused	0
In Progress	1
Reseller Providing Data	4
Count of Datasets by Status	370
Total Unique Providers Represented	200

Provider Name	Platform	Status	NDA Execution Date	Notes
AT&T Inc.	Mobile Wireless	Data Added to Statewide Inventory	12/16/2009	[AUG-01-13 Matthew Brunt] Changes and/or Corrections: Possible service expansion or corrections to previous dataset; entirely new dataset provided for October 2013 submission.
Cedar Falls Utilities	Fixed Wireless	Data Added to Statewide Inventory	6/16/2010	[AUG-30-13 Matthew Brunt] Change: Provider started offering fixed wireless service.
Cedar Falls Utilities	Fiber	Data Added to Statewide Inventory	6/16/2010	[AUG-22-13 Matthew Brunt] Change: Provider expanded fiber coverage area, and upgraded speeds to tier 11 download and tier 10 upload.
CenturyLink	DSL	Data Added to Statewide Inventory	12/4/2009	[AUG-16-13 Matthew Brunt] Changes and/or Corrections: Possible service expansion or corrections to previous dataset; entirely new dataset provided for October 2013 submission.
CenturyLink	Fiber	Data Added to Statewide Inventory	12/4/2009	[AUG-16-13 Matthew Brunt] Changes and/or Corrections: Possible service expansion or corrections to previous dataset; entirely new dataset provided for October 2013 submission.
Chat Mobility	Mobile Wireless	Data Added to Statewide Inventory	1/19/2010	[AUG-29-13 Matthew Brunt] Change: Provider submitted LTE coverage.
Clear Lake Independent Telephone Company	Fiber	Data Added to Statewide Inventory	5/6/2020	[AUG-26-13 Matthew Brunt] Change: This is the initial submission for the new subsidiary.
Frontier Communications Corporation	DSL	Data Added to Statewide Inventory	1/22/2010	[AUG-20-13 Matthew Brunt] Change: Provider sent updated DSLAM information.
Goldfield Access Network, L.C.	Fiber	Data Added to Statewide Inventory	1/22/2010	[JUN-18-13 Matthew Brunt] Change: Provider expanded fiber coverage area.
Grand Mound Cooperative Telephone Association	Fiber	Data Added to Statewide Inventory		[AUG-22-13 Matthew Brunt] Change: Provider expanded their fiber coverage area.
Grand River Mutual Telephone Corporation	DSL	Data Added to Statewide Inventory	2/5/2010	[AUG-23-13 Matthew Brunt] Change: Provider converted a portion of their DSL coverage area over to fiber.
Grand River Mutual Telephone Corporation	Fiber	Data Added to Statewide Inventory	2/5/2010	[AUG-23-13 Matthew Brunt] Change: Provider converted a portion of their DSL coverage area over to fiber.
Great Lakes Communication Corp.	Fixed Wireless	Data Added to Statewide Inventory	4/25/2013	[AUG-29-13 Matthew Brunt] Change: This is the initial submission for this provider.
Harmony Telephone Company	Fixed Wireless	Data Added to Statewide Inventory	1/12/2010	[AUG-27-13 Matthew Brunt] Change: Provider started offering fixed wireless service.
Hospers Telephone Exchange, Inc.	Fiber	Data Added to Statewide Inventory	1/11/2010	[JUN-18-13 Matthew Brunt] Change: Provider started offering fiber broadband service. x000D This is the initial submission for this platform.
Jab Wireless, Inc.	Fixed Wireless	Data Added to Statewide Inventory	6/14/2010	[SEP-03-13 Matthew Brunt] Change: Provider expanded their fixed wireless coverage area.
Leap Wireless International, Inc.	Mobile Wireless	Data Added to Statewide Inventory	4/6/2010	[AUG-16-13 Matthew Brunt] Changes and/or Corrections: Possible service expansion or corrections to previous dataset; entirely new dataset provided for October 2013 submission.
Marne & Elk Horn Telephone Company	DSL	Data Added to Statewide Inventory	2/11/2010	[JUL-31-13 Matthew Brunt] Change: Provider converted a portion of their DSL coverage over to fiber.
Marne & Elk Horn Telephone Company	Fiber	Data Added to Statewide Inventory	2/11/2010	[JUL-31-13 Matthew Brunt] Change: Provider expanded their fiber coverage.
Mechanicsville Telephone Company	DSL	Data Added to Statewide Inventory		[JUN-13-13 Matthew Brunt] Change: This is the initial submission for this provider.
Mechanicsville Telephone Company	Fixed Wireless	Data Added to Statewide Inventory		[JUN-13-13 Matthew Brunt] Change: This is the initial submission for this provider.
Mediacom Communications Corporation	Cable	Data Added to Statewide Inventory	1/12/2010	[AUG-26-13 Matthew Brunt] Change: Provider expanded their cable coverage area.
Mediapolis Telephone Company	Fiber	Data Added to Statewide Inventory	4/14/2010	[JUL-05-13 Matthew Brunt] Change: This is the initial submission for this platform from this provider.
Miles Cooperative Telephone Association	Fiber	Data Added to Statewide Inventory	5/17/2010	[JUL-02-13 Matthew Brunt] Change: Provider expanded their fiber service area.
Milford Cable TV Inc.	Cable	Data Added to Statewide Inventory	4/21/2010	[AUG-26-13 Matthew Brunt] Change: Provider changed their name to Milford Communications, added a new FRN, and reduced their coverage area.
Monarc Technologies	Fiber	Data Added to Statewide Inventory	2/16/2011	[JUN-18-13 Matthew Brunt] Change: Provider expanded fiber coverage area.
Olin Telephone Company, Inc.	Fiber	Data Added to Statewide Inventory	2/23/2010	[JUL-05-13 Matthew Brunt] Change: Provider expanded their fiber coverage area.
Palo Cooperative Telephone Association	Fiber	Data Added to Statewide Inventory	5/19/2010	[JUN-26-13 Layne Wagner] Change: Provider converted all DSL coverage over to fiber.
Panora Communications Cooperative	Fixed Wireless	Data Added to Statewide Inventory	1/29/2010	[AUG-29-13 Matthew Brunt] Change: Provider added an additional tower.
Panora Communications Cooperative	Fixed Wireless	Data Added to Statewide Inventory	1/29/2010	[AUG-29-13 Matthew Brunt] Change: Provider added additional tower sites.
South Slope Cooperative Telephone Company	DSL	Data Added to Statewide Inventory	2/2/2010	[AUG-30-13 Matthew Brunt] Change: Provider converted a portion of their DSL over to fiber.
South Slope Cooperative Telephone Company	Fiber	Data Added to Statewide Inventory	2/2/2010	[AUG-30-13 Matthew Brunt] Change: Provider converted a portion of their DSL over to fiber.

Sprint Nextel Corporation	Mobile Wireless	Data Added to Statewide Inventory	1/14/2010	[AUG-02-13 Matthew Brunt] Changes and/or Corrections: Possible service expansion or corrections to previous dataset; entirely new dataset provided for October 2013 submission.
T-Mobile USA, Inc.	Mobile Wireless	Data Added to Statewide Inventory	1/8/2010	[AUG-19-13 Matthew Brunt] Changes and/or Corrections: Possible service expansion or corrections to previous dataset; entirely new dataset provided for October 2013 submission.
Verizon Communications, Inc.	Mobile Wireless	Data Added to Statewide Inventory	12/14/2009	[AUG-01-13 Matthew Brunt] Changes and/or Corrections: Possible service expansion or corrections to previous dataset; entirely new dataset provided for October 2013 submission.
VS Enterprises, LTD	Cable	Data Added to Statewide Inventory		[SEP-03-13 Matthew Brunt] Correction: Initial submission of provider's coverage, but they were in service previously.
Webb Wireless, LLC	Fixed Wireless	Data Added to Statewide Inventory	8/14/2013	[AUG-29-13 Matthew Brunt] Change: This is the initial submission for this provider.
Western Iowa Networks	DSL	Data Added to Statewide Inventory	2/22/2010	[AUG-27-13 Matthew Brunt] Change: Provider expanded DSL coverage area outside of city limits and converted DSL to fiber within city limits.
Western Iowa Networks	Fiber	Data Added to Statewide Inventory	2/22/2010	[AUG-27-13 Matthew Brunt] Correction: Provider reduced fiber broadband coverage area.
Alliance Communications Cooperative, Inc.	Backhaul	Backhaul Provider Only Processing Complete	1/28/2010	
Iowa Network Services	Backhaul	Backhaul Provider Only Processing Complete	3/5/2010	
Long Lines	Backhaul	Backhaul Provider Only Processing Complete	5/4/2010	
Alliance Communications Cooperative, Inc.	Fiber	Speed Only Update; Data Processing Complete	1/28/2010	[AUG-21-13 Matthew Brunt] Change: Provider upgraded speeds to tier 10 download and tier 8 upload.
Atkins Telephone Company	DSL	Speed Only Update; Data Processing Complete	5/14/2010	[AUG-21-13 Matthew Brunt] Change: Provider upgraded speeds to tier 7 download and tier 7 upload.
Atkins Telephone Company	Fiber	Speed Only Update; Data Processing Complete	5/14/2010	[AUG-21-13 Matthew Brunt] Change: Provider upgraded speeds to tier 8 download and tier 7 upload.
Coon Rapids Municipal Utilities	Cable	Speed Only Update; Data Processing Complete	4/22/2010	[JUL-01-13 Matthew Brunt] Change: Provider upgraded speeds to tier 7 download and tier 5 upload.
CoxCom Inc.	Cable	Speed Only Update; Data Processing Complete	1/29/2010	[AUG-14-13 Matthew Brunt] Change: Provider upgraded speeds to tier 10 download and tier 7 upload.
Farmers Mutual Telephone Company - Jesup	DSL	Speed Only Update; Data Processing Complete	4/20/2010	[JUL-01-13 Matthew Brunt] Change: Provider upgraded speeds to tier 6 download and tier 3 upload.
Farmers Mutual Telephone Company - Jesup	Fiber	Speed Only Update; Data Processing Complete	4/20/2010	[JUL-01-13 Matthew Brunt] Change: Provider upgraded speeds to tier 6 download and tier 3 upload.
Grand Mound Cooperative Telephone Association	DSL	Speed Only Update; Data Processing Complete		[AUG-22-13 Matthew Brunt] Change: Provider upgraded speeds to tier 6 download.
Grand Mound Cooperative Telephone Association	Fixed Wireless	Speed Only Update; Data Processing Complete		[AUG-26-13 Matthew Brunt] Change: Provider upgraded speeds to tier 5 download in a portion of their coverage area.
Grand River Mutual Telephone Corporation	DSL	Speed Only Update; Data Processing Complete	2/5/2010	[AUG-22-13 Matthew Brunt] Change: Provider upgraded speeds to tier 7 download and tier 5 upload in a portion of their coverage area.
Grand River Mutual Telephone Corporation	Fiber	Speed Only Update; Data Processing Complete	2/5/2010	[AUG-22-13 Matthew Brunt] Change: Provider upgraded speeds to tier 7 download and tier 5 upload.
Grundy Center Municipal Utilities	Cable	Speed Only Update; Data Processing Complete		[AUG-21-13 Matthew Brunt] Change: Provider upgraded speeds to tier 7 download and tier 7 upload.
Hickory Tech Corporation	DSL	Speed Only Update; Data Processing Complete	2/2/2010	[AUG-21-13 Matthew Brunt] Change: Provider upgraded download speeds to tier 7 in portions of their coverage area.
Long Lines	DSL	Speed Only Update; Data Processing Complete	5/4/2010	[AUG-21-13 Matthew Brunt] Change: Provider upgraded their speeds to tier 6 download.
Mutual Telephone Company of Morning Sun, Iowa	DSL	Speed Only Update; Data Processing Complete	5/5/2010	[JUL-31-13 Matthew Brunt] Change: Provider upgraded speeds to tier 7 download.
Mutual Telephone Company of Morning Sun, Iowa	DSL	Speed Only Update; Data Processing Complete	5/5/2010	[AUG-01-13 Matthew Brunt] Change: Provider upgraded speeds to tier 7 download.
Panora Communications Cooperative	Cable	Speed Only Update; Data Processing Complete	1/29/2010	[JUL-02-13 Matthew Brunt] Change: Provider upgraded speeds to tier 3 upload.
Panora Communications Cooperative	Cable	Speed Only Update; Data Processing Complete	1/29/2010	[JUL-02-13 Matthew Brunt] Change: Provider upgraded speeds to tier 3 upload.
Royal Telephone Company	Fiber	Speed Only Update; Data Processing Complete	2/12/2010	[JUL-01-13 Matthew Brunt] Change: Provider upgraded speeds to tier 6 download and tier 5 upload.
Terril Telephone Cooperative	DSL	Speed Only Update; Data Processing Complete	2/12/2010	[JUL-01-13 Matthew Brunt] Change and Correction: Provider upgraded download speeds to tier 6 and corrected upload speeds to tier 3.
Webster-Calhoun Cooperative Telephone Association	Fiber	Speed Only Update; Data Processing Complete	5/21/2010	[JUL-01-13 Matthew Brunt] Change: Provider upgraded download speeds to tier 7 download.
Western Iowa Telephone Association	DSL	Speed Only Update; Data Processing Complete	4/22/2010	[AUG-21-13 Matthew Brunt] Change: Provider upgraded speeds to tier 10 download and tier 5 upload.
RuralWaves Wireless Internet	Fixed Wireless	No Update-Estimated Coverage Submitted for Non-Participating Provider		
BTWI Wireless Internet LLC	Fixed Wireless	Approval for Update Not Received - Data Still Submitted		[SEP-03-13 Matthew Brunt] Correction: Initial submission of provider's coverage, but they were in service previously.
Ace Telephone Association	Backhaul	No Update to Provide	3/8/2010	
Ace Telephone Association	DSL	No Update to Provide	3/8/2010	
Ace Telephone Association	Fixed Wireless	No Update to Provide	3/8/2010	
Algona Municipal Utilities	Cable	No Update to Provide	2/9/2010	
Algona Municipal Utilities	Fiber	No Update to Provide	2/9/2010	
Alpine Communications, LC	DSL	No Update to Provide	2/24/2010	

Alpine Communications, LC	Fiber	No Update to Provide	2/24/2010
Alta Municipal Utilities	Cable	No Update to Provide	5/18/2010
Andrew Telephone Company	DSL	No Update to Provide	1/19/2010
Arcadia Telephone Cooperative	DSL	No Update to Provide	5/6/2010
AT&T Inc.	Backhaul	No Update to Provide	12/16/2009
Aventure Communications	Backhaul	No Update to Provide	4/8/2010
Aventure Communications	Fixed Wireless	No Update to Provide	4/8/2010
Ayrshire Farmers Mutual Telephone Company	DSL	No Update to Provide	2/17/2010
Ayrshire Farmers Mutual Telephone Company	Fixed Wireless	No Update to Provide	2/17/2010
Baldwin Nashville Telephone Company, Inc.	DSL	No Update to Provide	2/3/2010
Baldwin Nashville Telephone Company, Inc.	Fiber	No Update to Provide	2/3/2010
Bellevue Municipal Utilities	Fiber	No Update to Provide	5/20/2010
BEVCOMM	DSL	No Update to Provide	6/16/2010
BitWind Communications, LLC	Fixed Wireless	No Update to Provide	
Board of Water Electric & Communication Trustees of the City of Muscatine	Cable	No Update to Provide	5/14/2010
Board of Water Electric & Communication Trustees of the City of Muscatine	Fiber	No Update to Provide	5/14/2010
Board of Water Electric & Communication Trustees of the City of Muscatine	Fixed Wireless	No Update to Provide	5/14/2010
Brooklyn Mutual Telecommunications Cooperative	DSL	No Update to Provide	4/21/2010
Butler-Bremer Mutual Telephone Company	Backhaul	No Update to Provide	4/20/2010
Butler-Bremer Mutual Telephone Company	Cable	No Update to Provide	4/20/2010
Butler-Bremer Mutual Telephone Company	DSL	No Update to Provide	4/20/2010
Butler-Bremer Mutual Telephone Company	Fiber	No Update to Provide	4/20/2010
Cable ONE Inc.	Cable	No Update to Provide	12/7/2009
Cascade Communications Company	DSL	No Update to Provide	1/23/2010
Cascade Communications Company	Fiber	No Update to Provide	1/23/2010
Casey Mutual Telephone Company	Backhaul	No Update to Provide	5/3/2010
Casey Mutual Telephone Company	DSL	No Update to Provide	5/3/2010
Center Junction Telephone Company	DSL	No Update to Provide	3/12/2010
Central Scott Telephone Company, Inc.	DSL	No Update to Provide	4/22/2010
Central Scott Telephone Company, Inc.	Fixed Wireless	No Update to Provide	4/22/2010
CenturyLink	Backhaul	No Update to Provide	12/4/2009
Circle Computer Resources	Fixed Wireless	No Update to Provide	7/6/2010
Citizens Mutual Telephone Cooperative	DSL	No Update to Provide	2/26/2010
Citizens Mutual Telephone Cooperative	Fiber	No Update to Provide	2/26/2010
City of Hawarden	Cable	No Update to Provide	5/20/2010
Clear Lake Independent Telephone Company	DSL	No Update to Provide	5/6/2020
Clear Lake Independent Telephone Company	Fiber	No Update to Provide	5/6/2020
CML Telephone Cooperative Association of Meriden, Iowa	Fiber	No Update to Provide	1/25/2010
Cogent Communications, Inc.	Backhaul	No Update to Provide	
Colo Telephone Company	Fiber	No Update to Provide	1/28/2010
Colo Telephone Company	Fiber	No Update to Provide	1/28/2010
Communications 1 Network, Inc.	Fiber	No Update to Provide	4/14/2010
Community Cable Television Agency of O'Brien County	Cable	No Update to Provide	5/5/2010
Community Cable Television Agency of O'Brien County	Fixed Wireless	No Update to Provide	5/5/2010
Community Digital Wireless, LLC	Fixed Wireless	No Update to Provide	5/6/2010
Complete Communication Services	Cable	No Update to Provide	6/17/2010
Complete Communication Services	Fiber	No Update to Provide	6/17/2010
Coon Creek Telecommunications Corp.	DSL	No Update to Provide	2/9/2012
Coon Valley Co-op Telephone Association, Inc.	DSL	No Update to Provide	
Coon Valley Co-op Telephone Association, Inc.	Fixed Wireless	No Update to Provide	
Cooperative Telephone Company	DSL	No Update to Provide	2/2/2010
Cooperative Telephone Company	Fixed Wireless	No Update to Provide	2/2/2010
Cooperative Telephone Exchange	Backhaul	No Update to Provide	2/2/2010
Cooperative Telephone Exchange	Fiber	No Update to Provide	2/2/2010
Corn Belt Telephone Company	DSL	No Update to Provide	2/15/2010
Corn Belt Telephone Company	Fiber	No Update to Provide	2/15/2010
Corn Belt Telephone Company	Fixed Wireless	No Update to Provide	2/15/2010
Darville Mutual Telephone Company	DSL	No Update to Provide	
Dixon Telephone Company	Cable	No Update to Provide	5/5/2010
Dumont Telephone Company	Cable	No Update to Provide	2/25/2010
Dumont Telephone Company	DSL	No Update to Provide	2/25/2010
Dumont Telephone Company	Fiber	No Update to Provide	2/25/2010
Dunkerton Telephone Cooperative	DSL	No Update to Provide	4/15/2010
Eastlight, LLC	Fixed Wireless	No Update to Provide	
Ellsworth Cooperative Telephone Association	Fiber	No Update to Provide	1/25/2010
Evertex Enterprises	Cable	No Update to Provide	2/3/2010
Evertex Enterprises	Fiber	No Update to Provide	2/3/2010
Evertex Enterprises	Fixed Wireless	No Update to Provide	2/3/2010
F&B Communications, Inc.	DSL	No Update to Provide	2/19/2010
F&B Communications, Inc.	Fiber	No Update to Provide	2/19/2010
Farmers Cooperative Telephone Company-Dysart	DSL	No Update to Provide	3/12/2010
Farmers Mutual Cooperative Telephone Company - Harlan	Cable	No Update to Provide	2/5/2010
Farmers Mutual Cooperative Telephone Company - Harlan	DSL	No Update to Provide	2/5/2010
Farmers Mutual Cooperative Telephone Company - Harlan	Fiber	No Update to Provide	2/5/2010
Farmers Mutual Cooperative Telephone Company - Harlan	Fixed Wireless	No Update to Provide	2/5/2010
Farmers Mutual Cooperative Telephone Company-Moulton	Fiber	No Update to Provide	5/21/2010
Farmers Mutual Telephone Company - Nora Springs	Cable	No Update to Provide	1/26/2010
Farmers Mutual Telephone Company - Nora Springs	DSL	No Update to Provide	1/26/2010
Farmers Mutual Telephone Company - Nora Springs	Fiber	No Update to Provide	1/26/2010
Farmers Mutual Telephone Company - Nora Springs	Fixed Wireless	No Update to Provide	1/26/2010
Farmers Mutual Telephone Company of Stanton, Iowa	Backhaul	No Update to Provide	4/9/2010
Farmers Mutual Telephone Company of Stanton, Iowa	Cable	No Update to Provide	4/9/2010
Farmers Mutual Telephone Company of Stanton, Iowa	DSL	No Update to Provide	4/9/2010
Farmers Mutual Telephone Company of Stanton, Iowa	DSL	No Update to Provide	4/9/2010
Farmers Telephone Company-Essex	DSL	No Update to Provide	1/27/2010
Farmers Telephone Company-Essex	Fixed Wireless	No Update to Provide	1/27/2010
Fiber Net Communications, L.C.	Backhaul	No Update to Provide	3/9/2010
FiberComm L.C.	Backhaul	No Update to Provide	2/15/2010
FiberComm L.C.	DSL	No Update to Provide	2/15/2010
FiberComm L.C.	Fixed Wireless	No Update to Provide	2/15/2010
Frontier Communications Corporation	Backhaul	No Update to Provide	1/22/2010
Goldfield Access Network, L.C.	DSL	No Update to Provide	1/22/2010
Goldfield Access Network, L.C.	DSL	No Update to Provide	1/22/2010
Grand River Mutual Telephone Corporation	Fixed Wireless	No Update to Provide	2/5/2010
Griswold Cooperative Telephone Company	DSL	No Update to Provide	4/21/2010
Grundy Center Municipal Utilities	Fixed Wireless	No Update to Provide	
Harlan Municipal Utilities	Cable	No Update to Provide	5/5/2010
Harmony Telephone Company	DSL	No Update to Provide	1/12/2010
Hawkeye Telephone Company	DSL	No Update to Provide	2/12/2010
Heart of Iowa Communications Cooperative	Backhaul	No Update to Provide	1/7/2010
Heart of Iowa Communications Cooperative	DSL	No Update to Provide	1/7/2010
Heart of Iowa Communications Cooperative	Fiber	No Update to Provide	1/7/2010

Heart of Iowa Communications Cooperative	Fixed Wireless	No Update to Provide	1/7/2010	
Hospers Telephone Exchange, Inc.	Cable	No Update to Provide	1/11/2010	
Hospers Telephone Exchange, Inc.	DSL	No Update to Provide	1/11/2010	
Hubbard Cooperative Telephone Association and Cable	DSL	No Update to Provide	5/14/2010	
Hughes Network Systems, LLC	Satellite	No Update to Provide	2/5/2010	
Huxley Communications Cooperative	Backhaul	No Update to Provide	1/25/2010	
Huxley Communications Cooperative	DSL	No Update to Provide	1/25/2010	
Huxley Communications Cooperative	Fiber	No Update to Provide	1/25/2010	
IAMO Telephone Company	DSL	No Update to Provide	1/25/2010	
IAMO Telephone Company	Fixed Wireless	No Update to Provide	1/25/2010	
ImOn Communications, LLC	Cable	No Update to Provide	2/8/2012	
ImOn Communications, LLC	Fiber	No Update to Provide	2/8/2012	
IMU Network Services	Fiber	No Update to Provide	5/10/2010	
IMU Network Services	Fixed Wireless	No Update to Provide	5/10/2010	
Independence Telecommunications Utility	Cable	No Update to Provide	4/9/2010	
Internet Solver, Inc.	DSL	No Update to Provide		
Interstate 35 Telephone Company	Fiber	No Update to Provide	2/2/2010	
Interstate 35 Telephone Company	Fiber	No Update to Provide	2/2/2010	
Jab Wireless, Inc.	DSL	No Update to Provide	6/14/2010	
Jefferson Telephone Company	DSL	No Update to Provide	1/22/2010	
Jefferson Telephone Company	Fiber	No Update to Provide	1/22/2010	
Kalona Cooperative Telephone Company	DSL	No Update to Provide	1/20/2010	[AUG-22-13 Matthew Brunt] Updated speeds were submitted by the provider, but they fell within the speed tiers we already have on file.
Kalona Cooperative Telephone Company	Fiber	No Update to Provide	1/20/2010	[AUG-22-13 Matthew Brunt] Updated speeds were submitted by the provider, but they fell within the speed tiers we already have on file.
Keystone Farmers Cooperative Telephone Company	DSL	No Update to Provide	4/12/2010	
Killduff Telephone Company	DSL	No Update to Provide		
La Motte Telephone Company, Inc.	DSL	No Update to Provide	2/16/2010	
La Motte Telephone Company, Inc.	Fiber	No Update to Provide	2/16/2010	
La Motte Telephone Company, Inc.	Fixed Wireless	No Update to Provide	2/16/2010	
La Porte City Telephone Co	DSL	No Update to Provide	2/22/2010	
Laurens Municipal Communications Utility	Cable	No Update to Provide	6/2/2010	
Lehigh Valley Cooperative Telephone Association	Fiber	No Update to Provide	4/16/2010	
Lenox Municipal Utilities	Fiber	No Update to Provide	4/20/2010	
Level 3 Communications, LLC	Backhaul	No Update to Provide	12/14/2009	
LISCO Wireless	Backhaul	No Update to Provide	1/28/2010	
LISCO Wireless	DSL	No Update to Provide	1/28/2010	
LISCO Wireless	Fiber	No Update to Provide	1/28/2010	
Loganet	Fixed Wireless	No Update to Provide	2/13/2013	
Lone Rock Cooperative Telephone Company	DSL	No Update to Provide	2/15/2010	
Long Lines	Backhaul	No Update to Provide	5/4/2010	
Long Lines	Backhaul	No Update to Provide	5/4/2010	
Long Lines	Backhaul	No Update to Provide	5/4/2010	
Long Lines	Backhaul	No Update to Provide	5/4/2010	
Long Lines	Backhaul	No Update to Provide	5/4/2010	
Long Lines	Cable	No Update to Provide	5/4/2010	
Lost Nation-Elwood Telephone Company	Fiber	No Update to Provide	4/13/2010	
Lynnvile Telephone Company, Inc.	DSL	No Update to Provide		
Mabel Cooperative Telephone Company	DSL	No Update to Provide	4/8/2010	
Manning Municipal Communication & Television System Utility	Cable	No Update to Provide	4/22/2010	
Manning Municipal Communication & Television System Utility	Fixed Wireless	No Update to Provide	4/22/2010	
Marne & Elk Horn Telephone Company	Backhaul	No Update to Provide	2/11/2010	
Marne & Elk Horn Telephone Company	Fixed Wireless	No Update to Provide	2/11/2010	
Martelle Cooperative Telephone Association	Cable	No Update to Provide	5/5/2010	
Martelle Cooperative Telephone Association	DSL	No Update to Provide	5/5/2010	
Massena Telephone Company	Backhaul	No Update to Provide	6/18/2010	
Massena Telephone Company	DSL	No Update to Provide	6/18/2010	
Massena Telephone Company	Fixed Wireless	No Update to Provide	6/18/2010	
Mediapolis Telephone Company	DSL	No Update to Provide	4/14/2010	
Midlowa Net	DSL	No Update to Provide		
Midlowa Net	Fixed Wireless	No Update to Provide		
Miles Cooperative Telephone Association	DSL	No Update to Provide	5/17/2010	
Minburn Communications	Backhaul	No Update to Provide	4/7/2010	
Minburn Communications	DSL	No Update to Provide	4/7/2010	
Minburn Communications	Fiber	No Update to Provide	4/7/2010	
Minburn Communications	Fixed Wireless	No Update to Provide	4/7/2010	
Minburn Communications	Fiber	No Update to Provide	4/7/2010	
Minerva Valley Telephone Cablevision, Inc.	DSL	No Update to Provide	4/7/2010	
Modern Cooperative Telephone Company Inc.	DSL	No Update to Provide		
Mutual Telephone Company	Fiber	No Update to Provide	1/25/2010	
Mutual Telephone Company of Morning Sun, Iowa	Fixed Wireless	No Update to Provide	5/5/2010	
New Ulm Telecom, Inc.	DSL	No Update to Provide	3/10/2010	
North English Cooperative Telephone Company	DSL	No Update to Provide	5/12/2010	
Northeast Iowa Telephone Company	Backhaul	No Update to Provide	4/13/2010	
Northeast Iowa Telephone Company	DSL	No Update to Provide	4/13/2010	
Northeast Iowa Telephone Company	Fiber	No Update to Provide	4/13/2010	
Northeast Iowa Telephone Company	Fixed Wireless	No Update to Provide	4/13/2010	
Northern Iowa Telephone Company	DSL	No Update to Provide	1/25/2010	
Northern Iowa Telephone Company	Fiber	No Update to Provide	1/25/2010	
Northwest Telephone Cooperative Association	Backhaul	No Update to Provide	2/17/2010	
Northwest Telephone Cooperative Association	DSL	No Update to Provide	2/17/2010	
Northwest Telephone Cooperative Association	Fixed Wireless	No Update to Provide	2/17/2010	
Olin Telephone Company, Inc.	DSL	No Update to Provide	2/23/2010	
Onslow Cooperative Telephone Association	DSL	No Update to Provide	2/3/2010	
Oran Mutual Telephone Company	DSL	No Update to Provide	2/8/2010	
Osage Municipal Communications Utility	Cable	No Update to Provide	5/18/2010	
Osage Municipal Communications Utility	Fixed Wireless	No Update to Provide	5/18/2010	
Palmer Mutual Telephone Company	DSL	No Update to Provide	1/21/2010	
Panora Communications Cooperative	Fiber	No Update to Provide	1/29/2010	
Panora Communications Cooperative	Fiber	No Update to Provide	1/29/2010	
Partner Communications Cooperative	Cable	No Update to Provide	5/15/2010	
Partner Communications Cooperative	DSL	No Update to Provide	5/15/2010	
Partner Communications Cooperative	Fiber	No Update to Provide	5/15/2010	
Prairieburg Telephone Company, Inc	DSL	No Update to Provide	3/25/2010	
Prairieburg Telephone Company, Inc	Fixed Wireless	No Update to Provide	3/25/2010	
Premier Communications	Cable	No Update to Provide	1/25/2010	
Premier Communications	Fiber	No Update to Provide	1/25/2010	
Preston Telephone Company	DSL	No Update to Provide	2/5/2010	
Radcliffe Telephone Company, Inc.	Backhaul	No Update to Provide	4/26/2010	
Radcliffe Telephone Company, Inc.	Fiber	No Update to Provide	4/26/2010	
Readlyn Telephone Company	DSL	No Update to Provide	2/23/2010	

Readlyn Telephone Company	Fiber	No Update to Provide	2/23/2010
Reasnor Telephone Company, LLC	DSL	No Update to Provide	
River Valley Telecommunications Coop	DSL	No Update to Provide	3/23/2010
River Valley Telecommunications Coop	Fiber	No Update to Provide	3/23/2010
River Valley Telecommunications Coop	Fixed Wireless	No Update to Provide	3/23/2010
Rockwell Cooperative Telephone Association	Backhaul	No Update to Provide	5/12/2010
Rockwell Cooperative Telephone Association	DSL	No Update to Provide	5/12/2010
Rockwell Cooperative Telephone Association	Fiber	No Update to Provide	5/12/2010
Rockwell Cooperative Telephone Association	Fixed Wireless	No Update to Provide	5/12/2010
Sac County Mutual Telephone Co.	Backhaul	No Update to Provide	2/15/2010
Sac County Mutual Telephone Co.	DSL	No Update to Provide	2/15/2010
Scranton Telephone Company	Backhaul	No Update to Provide	2/1/2010
Scranton Telephone Company	DSL	No Update to Provide	2/1/2010
Searsboro Telephone Company	DSL	No Update to Provide	
Sharon Telephone Company	Backhaul	No Update to Provide	5/20/2010
Sharon Telephone Company	DSL	No Update to Provide	5/20/2010
Sharon Telephone Company	Fiber	No Update to Provide	5/20/2010
Sharon Telephone Company	Fixed Wireless	No Update to Provide	5/20/2010
Skycasters	Satellite	No Update to Provide	10/16/2012
Spacenet, Inc.	Satellite	No Update to Provide	
SpeedNet, LLC	Fixed Wireless	No Update to Provide	
Spencer Municipal Utilities	Backhaul	No Update to Provide	2/18/2010
Spencer Municipal Utilities	Cable	No Update to Provide	2/18/2010
Spencer Municipal Utilities	Fiber	No Update to Provide	2/18/2010
Spring Grove Cooperative Telephone Co	Fiber	No Update to Provide	
Springville Cooperative Telephone Association, Inc.	DSL	No Update to Provide	2/15/2010
Sprint Nextel Corporation	Backhaul	No Update to Provide	1/14/2010
Sully Telephone Association Inc	DSL	No Update to Provide	4/28/2010
Sully Telephone Association Inc	Fixed Wireless	No Update to Provide	4/28/2010
Superior Telephone Cooperative	DSL	No Update to Provide	5/24/2010
Swisher Telephone Company	Fiber	No Update to Provide	2/2/2010
Templeton Telephone Company	Backhaul	No Update to Provide	3/12/2010
Templeton Telephone Company	DSL	No Update to Provide	3/12/2010
Traer Municipal Utilities	Fixed Wireless	No Update to Provide	4/14/2010
United States Cellular Corporation	Mobile Wireless	No Update to Provide	2/15/2011
USA Communications	Cable	No Update to Provide	1/27/2010
USA Communications	DSL	No Update to Provide	1/27/2010
USA Communications	Fiber	No Update to Provide	1/27/2010
Van Buren Telephone Co Inc	DSL	No Update to Provide	1/26/2010
Van Horne Cooperative Telephone Company	Backhaul	No Update to Provide	5/18/2010
Van Horne Cooperative Telephone Company	DSL	No Update to Provide	5/18/2010
Van Horne Cooperative Telephone Company	Fiber	No Update to Provide	5/18/2010
ViaSat, Inc.	Satellite	No Update to Provide	1/8/2010
Walnut Telephone Company	Backhaul	No Update to Provide	4/14/2010
Walnut Telephone Company	Cable	No Update to Provide	4/14/2010
Walnut Telephone Company	DSL	No Update to Provide	4/14/2010
Walnut Telephone Company	Fiber	No Update to Provide	4/14/2010
Walnut Telephone Company	Fixed Wireless	No Update to Provide	4/14/2010
Webb-Dickens Telephone Corporation	Fiber	No Update to Provide	1/25/2010
Wellman Cooperative Telephone Association	DSL	No Update to Provide	5/19/2010
Wellman Cooperative Telephone Association	Fiber	No Update to Provide	5/19/2010
Wellman Cooperative Telephone Association	Fixed Wireless	No Update to Provide	5/19/2010
West Iowa Telephone Company	Cable	No Update to Provide	1/27/2010
West Iowa Telephone Company	DSL	No Update to Provide	1/27/2010
West Iowa Telephone Company	Fiber	No Update to Provide	1/27/2010
West Liberty Telephone Company	Backhaul	No Update to Provide	1/25/2010
West Liberty Telephone Company	DSL	No Update to Provide	1/25/2010
West Liberty Telephone Company	Fixed Wireless	No Update to Provide	1/25/2010
West Liberty Telephone Company	Fiber	No Update to Provide	1/25/2010
Western Iowa Networks	Fixed Wireless	No Update to Provide	2/22/2010
Winnebago Cooperative Telecom Association	Backhaul	No Update to Provide	1/22/2010
Winnebago Cooperative Telecom Association	DSL	No Update to Provide	1/22/2010
Winnebago Cooperative Telecom Association	Fiber	No Update to Provide	1/22/2010
Woolstock Mutual Telephone	Backhaul	No Update to Provide	5/19/2010
Woolstock Mutual Telephone	DSL	No Update to Provide	5/19/2010
Woolstock Mutual Telephone	Fixed Wireless	No Update to Provide	5/19/2010
WTC Communications, Inc.	Cable	No Update to Provide	3/22/2010
WTC Communications, Inc.	DSL	No Update to Provide	3/22/2010
WTC Communications, Inc.	Fixed Wireless	No Update to Provide	3/22/2010
Wyoming Mutual Telephone Company	DSL	No Update to Provide	2/19/2010
Zayo Group, LLC	Backhaul	No Update to Provide	
Be Line Wireless	Fixed Wireless	No Update Provided – Use Last Submission Data	1/15/2013
Bernard Telephone Company, Inc.	DSL	No Update Provided – Use Last Submission Data	5/19/2010
Bernard Telephone Company, Inc.	Fiber	No Update Provided – Use Last Submission Data	5/19/2010
Bernard Telephone Company, Inc.	Fixed Wireless	No Update Provided – Use Last Submission Data	5/19/2010
Bernard Telephone Company, Inc.	Backhaul	No Update Provided – Use Last Submission Data	5/19/2010
Clarence Telephone Company, Inc.	Fiber	No Update Provided – Use Last Submission Data	
Cumberland Telephone Company	Fixed Wireless	No Update Provided – Use Last Submission Data	4/27/2010
Cumberland Telephone Company	DSL	No Update Provided – Use Last Submission Data	4/27/2010
East Buchanan Telephone Cooperative	DSL	No Update Provided – Use Last Submission Data	4/30/2010
Farmers & Merchants Mutual Telephone Company	Fixed Wireless	No Update Provided – Use Last Submission Data	5/7/2010
Farmers & Merchants Mutual Telephone Company	Fiber	No Update Provided – Use Last Submission Data	5/7/2010
Fenton Co-Op Telephone Company	DSL	No Update Provided – Use Last Submission Data	4/16/2010
Internet Consulting Services, LLC	Fixed Wireless	No Update Provided – Use Last Submission Data	5/19/2010
Kalnet	Fixed Wireless	No Update Provided – Use Last Submission Data	5/21/2010
Mediacom Communications Corporation	Backhaul	No Update Provided – Use Last Submission Data	1/12/2010
Ogden Telephone Company	DSL	No Update Provided – Use Last Submission Data	3/17/2010
Ogden Telephone Company	Backhaul	No Update Provided – Use Last Submission Data	3/17/2010

Ringtel Communications	DSL	No Update Provided – Use Last Submission Data	2/17/2010	
Schaller Telephone Company	DSL	No Update Provided – Use Last Submission Data		
Sioux Valley Rural Television, Inc.	Fixed Wireless	No Update Provided – Use Last Submission Data	6/7/2010	[SEP-17-13 Ashley Hitt] Provider representative indicated they are now refusing to participate, so the most recent dataset is being submitted; however, there is new management with whom participation is being re-discussed.
Spiral Communications LLC	Fixed Wireless	No Update Provided – Use Last Submission Data		
Titonka Telephone Company	DSL	No Update Provided – Use Last Submission Data	5/4/2010	
Titonka Telephone Company	Backhaul	No Update Provided – Use Last Submission Data	5/4/2010	
WideOpenWest Finance, LLC	Cable	No Update Provided – Use Last Submission Data		
Windstream Communications	DSL	No Update Provided – Use Last Submission Data		
Windstream Communications	DSL	Solicited Initial Data		

**APPENDIX B: CONNECTED NATION SATELLITE BROADBAND
FIELD TESTING REPORT**



CONNECTED NATION SATELLITE BROADBAND FIELD TESTING REPORT

SEPTEMBER 2013

With equipment spinning thousands of miles above the surface of the earth and covering vast physical land masses, satellite broadband validations have been a bit of a challenge for Connected Nation's Engineering and Technical Services (ETS) team...until now. This white paper discusses some of the challenges of satellite as a broadband platform, a new process developed by the ETS team to validate satellite broadband providers in the field, and results from a validation methodology derived from leveraging CN's broadband inquiry database.

Residential Satellite Broadband Today

Satellite direct-to-home broadband services have experienced numerous improvements in technology and capabilities in recent months. Residential satellite broadband can now deliver multi-megabit speeds and vastly improved performance compared to earlier versions at an affordable price. Satellite broadband is available to virtually every consumer location within the continental United States, as long as a clear view of the southern sky is available.

While WiFi networks utilize certain frequencies to operate at very short distances, satellite broadband uses spectrum licensed by the Federal Communications Commission to transmit at much higher frequencies, able to reach 22,500 miles from the earth's surface. The view of the continental United States is excellent from that distance, and the customer equipment back on Earth is extremely efficient in communicating in a two-way broadband Internet mode with the satellite systems deployed in geo-synchronous orbit in space.

When satellite delivered broadcast *television* services are in use, one is joining in on a broadcast sent to thousands of consumers in a one-way, receive-only mode. With any Internet broadband connection, however, each connection is typically delivered individually to the person making the request, thus requiring *two-way* communication, and sufficient bandwidth to accommodate all of the simultaneous requests. Even though the radio signals are traveling at the speed of light, there is a slight time delay from the moment a person makes a request at home to the time a response is received back from the satellite. This delay is called "latency" and is typically caused by signal processing that occurs within all routers, switches, servers, and transmission equipment.

Latency is present in all broadband services to varying degrees, based upon several factors, but is usually very short – typically 50 milliseconds with terrestrial broadband services such as DSL and cable modem. As a comparison, a human blinks at a speed of about 300-400 milliseconds (ms), so a person would normally not notice terrestrial broadband latency. In satellite broadband systems, however, latency is longer due to the great distance in sending the signals

to and from the earth – in addition to the normal terrestrial latency. A satellite broadband system located 22,500 miles away – nearly the entire distance around Earth’s equator – has a typical latency of at least 700 ms, or more than ten times the latency found with terrestrial broadband systems.

In addition to the challenge of high latency, additional problems have historically plagued satellite broadband technology from a marketing perspective. Such problems include expensive equipment costs and service plans, complex installations, and slow broadband service in comparison to other land-based cable, DSL, fixed wireless, and fiber broadband services. This report steers away from the economics and marketing of the service and focuses instead on the validation of the delivery system and its achieving broadband speeds.

How is Satellite Broadband Deployed?

Connected Nation recognizes five satellite providers offering residential broadband service in the nine states and one U.S. territory in which CN currently collects and submits broadband datasets. Although each provider determines its own satellite configuration, this paper will focus on one satellite broadband provider, ViaSat, who operates the Exede satellite delivery system. ViaSat also owns the WildBlue satellite broadband system.

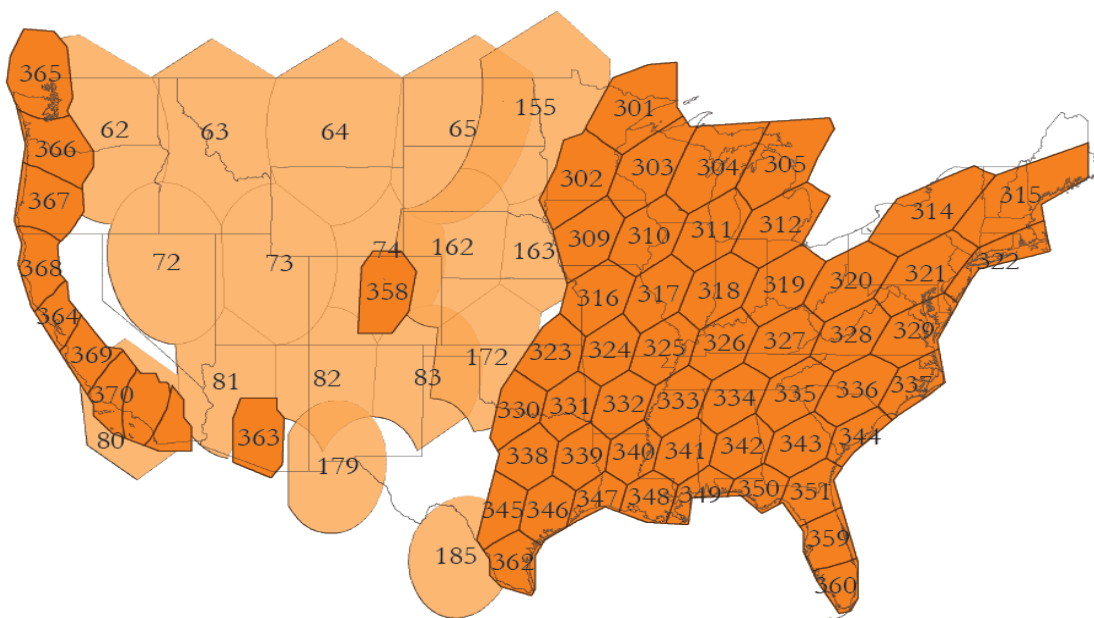
WildBlue service was an early entrant in satellite broadband and was sold across the country to accommodate the demand for rural broadband where other traditional broadband service providers did not, or could not, provide service. As the WildBlue customer base increased, and as Internet applications and bandwidth needs also increased to support a multitude of new “apps,” the system became overloaded – just as land-based systems also became overloaded. Early adopters who had purchased their satellite systems with significant individual investment became frustrated with slow and unreliable services, especially as additional new satellite customers came onto the system and compounded the problem.

To resolve the congestion and overload problem created by serving the entire continental United States with a small number of Internet broadband satellite transponders, ViaSat created the Exede delivery system. The deployment of this system required a highly technical and extremely aggressive investment plan based on spot beams covering small geographic areas on Earth – typically 200-300 miles across. Spot beams re-use frequencies in consecutive areas stacked together like a honeycomb. This deployment structure essentially multiplies the available capacity over and over with each additional spot beam deployed. The end result is that the satellite broadband service bandwidth and capacity are greatly improved. ViaSat now claims that the Exede system has enough newly installed spot beam capacity to accommodate an additional 1 million residential users.

Exede’s spot beams shadow, rather than replace, WildBlue satellite broadband signals. ViaSat’s strategy for the rollout of the Exede spot beams was to first overlay coverage of earlier satellite broadband deployments where the highest density of satellite broadband subscribers already existed. By doing so, the company can minimize overloading the older systems as new

customers come on board. As a result, ViaSat operates WildBlue and Exede services simultaneously with separate speeds and technical platforms. For example, the WildBlue service offers download speeds as high as 5 Mbps, whereas, Exede advertises a 12 Mbps service.

ViaSat's WildBlue Footprint and Exede Spot Beams



White areas have no ViaSat satellite coverage.

Exede's Advertised Broadband Speed

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Obtaining residential satellite broadband service is relatively easy and affordable, although early adopters are often chagrined at a second equipment investment required to make use of improved services. For Exede's satellite service, each system is installed and activated by a local, professionally trained dealer within the Exede network. Satellite *television* installers may not be qualified to install satellite broadband due to the more rigorous requirements related to the two-way connection needed for broadband Internet.

Validating Satellite Broadband

Connected Nation's ETS team has two main objectives in validating a provider's broadband service: 1) confirm the provider's presence in the target testing area, and 2) confirm that the provider's Internet service meets or exceeds the required minimum broadband speed. To confirm a provider's presence, a CN technician would visit, inspect, and document (often with pictures) provider office locations, broadband equipment in the field, billboards, and other local advertising, and detected WiFi networks. For mobile and fixed wireless networks, a technician can often perform signal tests for known frequencies licensed to and/or used only by that provider. If an Internet connection is found and accessed in the field, the detected provider's service could also be tested using a speed-test utility.

Over the past three years, attempts to use any of these techniques for satellite validation proved futile as the basic tools for validating other platforms do not exist for satellite. For example, residential satellite equipment for broadband is difficult to distinguish from satellite video gear as viewed from the street. Further, a satellite installer can serve several counties, and may not have a retail presence. As a result, confirming the presence of a specific satellite provider in any targeted community has been challenging. In trying to confirm broadband speeds, historically slow speeds and high latency on the satellite services have also prevented this level of validation.

The CN ETS team recently devised an approach to confirm both presence and speed by deepening the desktop research in advance of field validation, accessing controlled use of satellite testing equipment, and leveraging CN's rich database of broadband inquiries. Using Exede as a participating test subject and model for satellite broadband validation, an ETS technical engineer fine-tuned the process in Iowa and Minnesota as described below.

The first objective was to confirm that Exede service was available throughout a targeted service area. In addition to using the Exede coverage map above, the engineer used Exede's website to look at each individual county within Iowa to find all Exede dealers, installation companies, and storefronts. Using this tool, he located 28 authorized dealers serving 98 of Iowa's 99 counties. Many dealers are actually electric or telephone cooperatives such as the rural Exede dealer and electric co-op in Jackson, Minnesota, shown below. In identifying these dealers, CN confirmed the provider's presence virtually throughout the state.

Exede Authorized Dealer – Federated Rural Electric Association in Jackson, MN



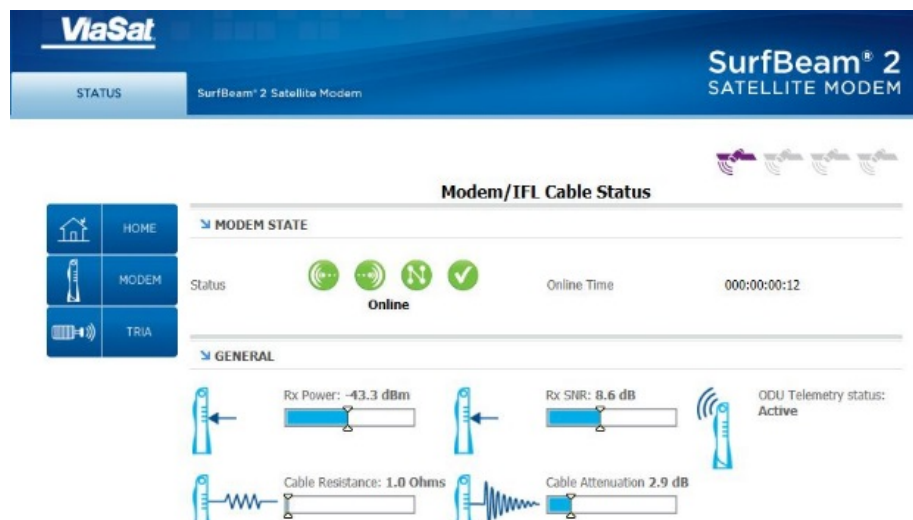
The next step was to identify specific provider equipment at various locations. Since satellite broadband equipment is difficult to distinguish from satellite television equipment, CN teamed with an Iowa Exede representative to obtain the use of Exede equipment for 30 days. The testing began at a *fixed* location chosen by CN – the Worthington Bio-Technology Advancement Center in Worthington, Minnesota. The center’s manager agreed to allow CN to use the Worthington facility to test the satellite service to help promote satellite broadband technology for rural residential and educational purposes.

Exede Installation and Test Site in Worthington, MN



The Exede system was installed and demonstrated by Sean Clarke, of Tri-Lakes Consulting. The broadband equipment was set up on a temporary ground-mount in front of the center with a cable extending to the building and then inside to a modem and computer. The equipment assembly was straightforward, and only one RG-6 cable was necessary for the installation (previous versions required two cables, making installation and troubleshooting more difficult). The azimuth and elevation presets arrive with the system for the specific zip code where the system is to be installed, which shortens the field installation time for the trained technician. The satellite dish was coarse-tuned, and the modem equipment was connected. After the dish was fine-tuned, the installer established an Internet connection, and performed an automatic firmware and software download with the latest versions of Exede's operating requirements. Once the download was complete (a few minutes), the system was engaged and ready for use.

Exede's Internet Connection GUI



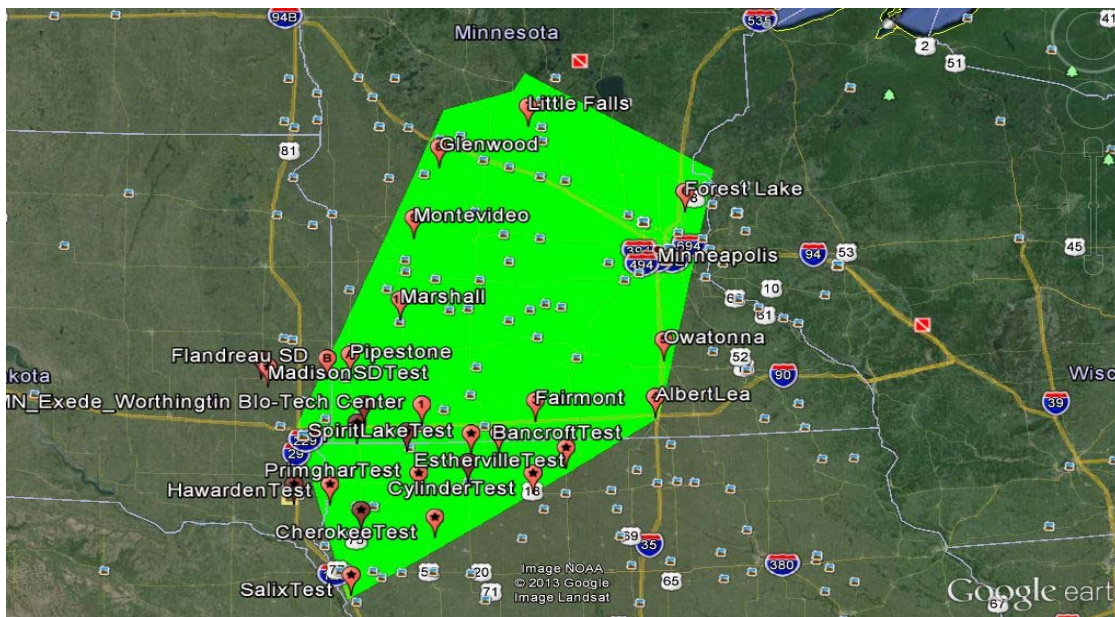
Exede's satellite broadband service consistently delivered the advertised speed of 12 Mbps, and many tests performed well beyond the advertised speed. Internet applications worked well, and download tests consistently delivered multi-megabit packages. Streaming video worked well with no buffering, and upstream speed tests were smooth and consistent. **As a result of this supervised testing, CN was able to confirm both the presence of the satellite provider in a targeted area, and that the provider delivered broadband-defined speeds within the area.**

Field Validation Testing

For testing Exede's satellite broadband service in multiple residential areas, the engineer selected Exede's Spot Beam 302 and tested in a variety of locations. The targeted spot beam coverage includes a large portion of southwestern Minnesota, as well as a portion of northwestern Iowa. He was able to secure the Exede receiver system on a hitch mount on the

back of a vehicle, and connected the system to a portable power inverter and laptop. To test the system at numerous locations within the boundary of the advertised spot beam, the system was re-tuned at each testing location using the Worthington set-up parameters as a reference. Numerous tests were conducted at the edge of the spot beam to determine if the signal degraded at the spot beam's defined boundaries. In fact, once the system was locked in place as described below, the system performed equally well at the edge of, or even slightly out of, the beam as it did in the center of the beam.

Satellite Broadband Speed Test Locations within Exede's Spot Beam 302



Testing began in the Minnesota portion of the spot beam as shown with the location markers in the map above. A week later, beam testing and performance testing took place in a similar format within Iowa utilizing the same Exede equipment. Although there were no extreme or heavy weather conditions during the testing process, temperatures were typically hot and humid, with some days of overcast conditions. Testing was performed at various times of day (**Exhibit 1**).

Testing the Exede system required a clear view of the southern sky. After stopping at a suitable location, the engineer would level the satellite receiver equipment and coarse-tune the low-noise block (LNB) transverter arm of the satellite dish; the LNB collects the radio waves sent to the dish from the satellite, and prepares it for transmission through the cabling to the modem and computer. The equipment would then be oriented south, and elevated to a reasonable inclination for set-up. Orientation would be fine-tuned and completed using a PC-aided installation set-up procedure, and the settings would be locked for use.

Installation and Testing Parameters

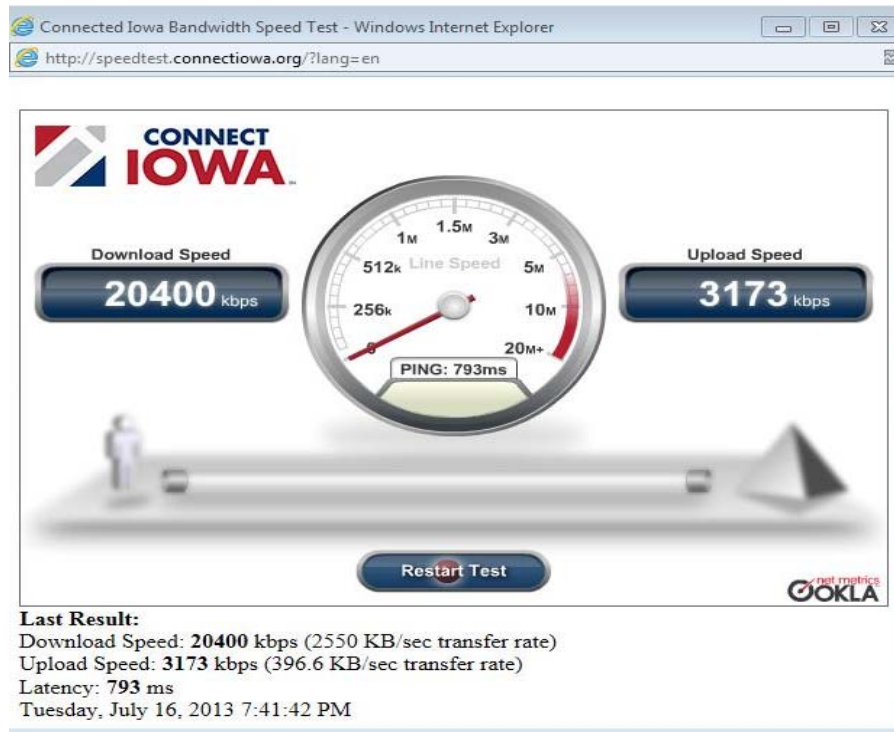


Installation Parameters	
Installer ID	
Provisioned Beam	302
Provisioned Satellite	ViaSat-1
Desired Satellite	ViaSat-1
Azimuth	204.3°
Elevation	36.0°
Skew	70.8°
Boom Arm Angle	16.6°
APA/Modem Key	NW XF-P5PR-5DJF-KRC5
Equipment	SB2
Polarization	Right
Latitude	43.6401°
Longitude	-95.5915°



Using the modem and laptop configuration, signal strengths were recorded and speed tests were performed and documented (**Exhibit 2**) using both Connect Minnesota and Connect Iowa websites. As a secondary reference, speed tests were also recorded and documented using the SpeakEasy.net speed test using Chicago, Illinois as the common speed test gateway location. Exede speed test results typically exceeded the advertised 12 Mbps download speed.

Sample Speed Test Results from Exede Test in Bancroft, IA



Just as the presence and speed of the Exede satellite broadband system was confirmed at the fixed location in Worthington, Minnesota and similar to processes followed for other broadband providers and platforms, this new testing process developed by the ETS team successfully validated the Exede broadband service throughout the targeted test areas in Minnesota and Iowa.

In Minnesota and Iowa, the technical engineer successfully utilized satellite equipment to perform speed tests in the field and confirmed ViaSat as a viable broadband provider through its Exede satellite service. Fortunately for this single service provider in these two states, the engineer was able to secure the temporary use of broadband equipment. For those states in which satellite equipment may *not* be available for portable testing, however, the ETS team devised an alternate approach to testing and validating satellite broadband service.

Broadband Inquiries

Connected Nation has received thousands of inquiries from consumers seeking broadband service alternatives. Scores of those inquiries come from consumers currently accessing the Internet at home with satellite service. By enlisting the help of those consumers to test their satellite service through the CN state websites, the ETS team created a process to both verify the presence of specific providers at specific locations (the consumers' addresses), and obtain speed test results for validating broadband speeds.

To test the process, a second CN technical engineer identified all broadband inquiries received in the state of South Carolina in which the consumer identified himself or herself as a satellite customer. An e-mail was sent to all relevant consumers requesting that they visit the Connect South Carolina website and perform a speed test using their home satellite service. By placing a deadline of 24 hours in which to perform the test, he was able to obtain the test results for the website during that test period, cross-check the noted names and addresses on the tests against the inquiry list, and filter out all other tests unrelated to satellite service.

In South Carolina, the results were both substantial and informative. On a selected Thursday, this second engineer sent speed test requests to 20 e-mail addresses. Within the noted 24 hours, information was received from 9 of those addresses (45%). Of those 9, 5 performed speed tests (20% test rate). Both HughesNet and ViaSat were able to be validated in South Carolina as a result of the tests (below).

South Carolina Speed Tests Performed by Satellite Internet Consumers

Provider	Test Site Info							Speed Test Data					
Provider	Test City	Test State	Test County	Physical Address	Latitude	Longitude	Presence Confirmed	Utility	Time	Ping Time (ms)	Download Speed (kbps)	Upload Speed (kbps)	Min Speed Met?
Hughes Network Systems, LLC	Pauline	SC	Spartanburg	Old Hills Bridge Rd	34.74	-81.88	Yes	connectsc.org	5:16 PM	861	4870	308	Yes
Hughes Network Systems, LLC	Westminster	SC	Oconee	Tallulah Dr	34.57	-83.09	Yes	connectsc.org	9:00 PM	1146	571	133	No
Hughes Network Systems, LLC	Ridgeville	SC	Dorchester	Myers Mayo Rd	33.10	-80.27	Yes	connectsc.org	10:37 PM	836	1248	190	Yes
ViaSat Communications, Inc.	Edgefield	SC	Edgefield	Abel Drive	33.70	-82.08	Yes	connectsc.org	9:14 PM	867	7039	1470	Yes
Hughes Network Systems, LLC	Prosperity	SC	Saluda	Denny Highway	34.13	-84.54	Yes	connectsc.org	10:39 PM	645	9142	615	Yes

The original technical engineer also performed a similar process in Iowa. Within 24 hours of his request, he received information from 13 of 32 addressed consumers. Ten e-mails were returned indicating that the consumers switched away from satellite service. Of the remaining 3, 2 responded stating that they were no longer satellite users in the state, and the last actually performed a speed test.

Although the response rate from South Carolina satellite users was higher than in Iowa, **in both states, CN can count at least one satellite validation with confirmation of the provider's location and speed.**

Conclusion

For many rural consumers, satellite service is the only platform available for accessing the Internet, other than dial-up telephone. Historically, satellite broadband has been expensive and slow, and much of the blame has been placed on the simple physics of transmitting wireless data traffic nearly the distance of Earth's circumference – twice for each mouse click. This extreme distance, relative to other broadband alternatives, results in noticeable delay – or latency – in broadband performance that can be more than 10 times greater than that experienced using other terrestrial broadband platforms.

For Connected Nation's ETS team, the challenges of both distance and latency had been significant obstacles to validating satellite broadband providers. Two new processes, however,

have been developed and tested to meet that challenge. One process uses standard satellite equipment rigged to a portable carrier to test speeds throughout targeted areas, and the second process leverages CN's broadband inquiry database to enlist consumers to perform speed tests that can be analyzed.

Using ViaSat's Exede satellite network as a test subject, the CN technical engineer performed speed tests at a fixed location as a base case, and then devised a method to carry the satellite equipment to various remote locations, fine-tune the equipment to lock in the two-way satellite signal at each location, perform speed tests over Exede's satellite service, and capture the results of those tests. In CN's field testing, consistent downstream and upstream speeds were experienced at the locations tested – even at the edges of the spot-beam.

For those states in which satellite equipment may *not* be available for portable testing, the ETS team successfully tested a validation process by requesting, capturing, and filtering test results using CN's database of broadband inquiries, many of which originated from satellite broadband users who responded to our email requests for assistance.

With these two new processes, and with the help of both satellite providers and satellite users, Connected Nation's ETS team now can perform reliable testing for satellite validations.

Exhibit 1 Speed Test Results by Time of Day

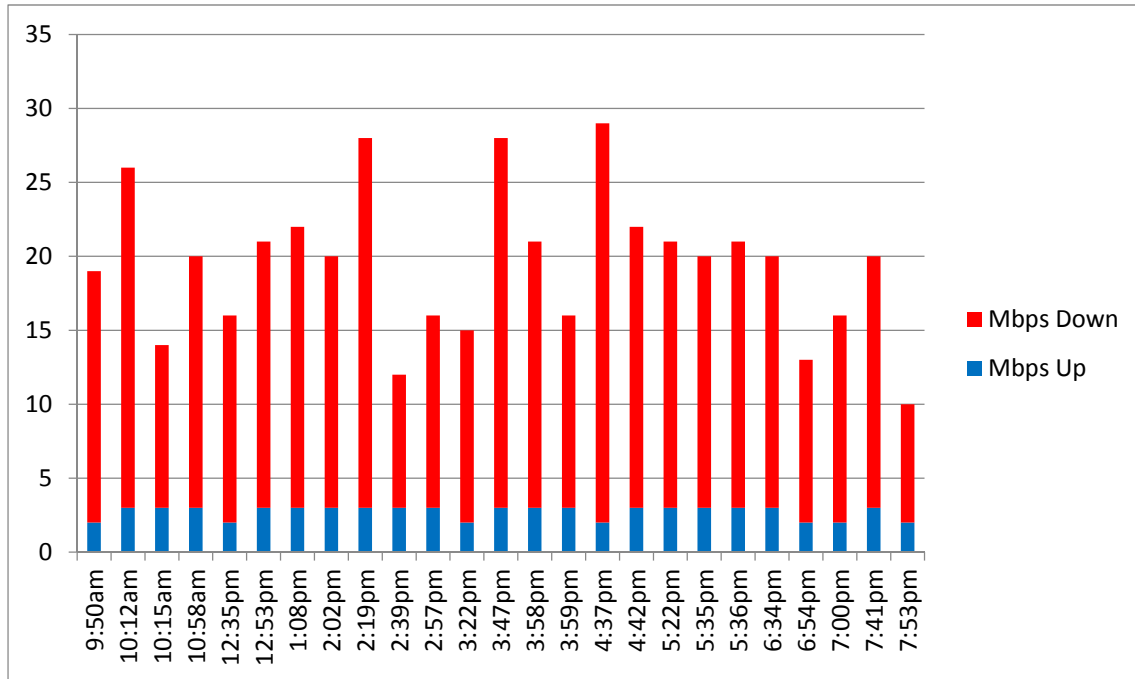


Exhibit 2 Exede Field Test Speed and Latency Results from Iowa/Minnesota Beam 302

Location	Date	Time	Zip Code	Exede Advertized Speeds DS/US	Connect IA/ MN.org Speedtest Actual Tested DS/US	Speakeasy.net Speedtest Actual Tested DS/US	Exede Advertized Latency	Connect IA/ MN.org Actual Tested Latency	Speakeasy.net Actual Tested Latency	Jitter
Worthington, MN	07-08-13	3:22pm	56187	12Mbps/3Mbps	15.048Mbps/2.361Mbps	11.72Mbps/2.50Mbps	700 milliseconds	901 ms	N/A	N/A
Luverne, MN	07-10-13	10:12am	56165	12Mbps/3Mbps	26.40Mbps/2.98Mbps	11.64Mbps/2.58Mbps	700 milliseconds	853 ms	691 ms	12 ms
Fairmont, MN	07-10-13	12:35pm	56031	12Mbps/3Mbps	15.80Mbps/2.47Mbps	9.2Mbps/2.01Mbps	700 milliseconds	857 ms	677 ms	14 ms
Albert Lea, MN	07-10-13	2:19pm	56007	12Mbps/3Mbps	28.14Mbps/3.04Mbps	9.19Mbps/2.23Mbps	700 milliseconds	858 ms	691 ms	15 ms
Owatonna, MN	07-10-13	3:59pm	55060	12Mbps/3Mbps	16.39Mbps/2.62Mbps	22.63Mbps/2.81Mbps	700 milliseconds	911 ms	715 ms	25 ms
Forest Lake, MN	07-10-13	6:54pm	55013	12Mbps/3Mbps	12.75Mbps/2.11Mbps	11.47Mbps/2.54Mbps	700 milliseconds	860 ms	683 ms	17 ms
Little Falls, MN	07-11-13	9:50am	56345	12Mbps/3Mbps	19.13Mbps/2.09Mbps	10.52Mbps/2.02Mbps	700 milliseconds	936 ms	705 ms	19 ms
Montevideo, MN	07-11-13	3:58pm	56265	12Mbps/3Mbps	21.032Mbps/2.661Mbps	22.46Mbps/3.52Mbps	700 milliseconds	901 ms	667 ms	10 ms
Marshall, MN	07-11-13	5:36pm	56258	12Mbps/3Mbps	20.506Mbps/2.777Mbps	11.95Mbps/2.11Mbps	700 milliseconds	842 ms	666 ms	09 ms
Pipestone, MN	07-11-13	7:00pm	56164	12Mbps/3Mbps	15.665Mbps/2.367Mbps	11.27Mbps/2.53Mbps	700 milliseconds	889 ms	679 ms	10 ms
Flandreau, SD	07-11-13	7:53pm	57028	12Mbps/3Mbps	10.361Mbps/1.881Mbps	9.21Mbps/2.2Mbps	700 milliseconds	921 ms	679 ms	12 ms
Steen, MN	07-16-13	10:58am	56173	12Mbps/3Mbps	20.249Mbps/3.081Mbps	12.41Mbps/2.48Mbps	700 milliseconds	786 ms	672 ms	11 ms
Sibley, IA	07-16-13	12:53pm	51249	12Mbps/3Mbps	21.205Mbps/3.183Mbps	11.21Mbps/2.66Mbps	700 milliseconds	798 ms	679 ms	18 ms
Primghar, IA	07-16-13	2:02pm	51245	12Mbps/3Mbps	19.722Mbps/3.122Mbps	11.00Mbps/2.44Mbps	700 milliseconds	792 ms	695 ms	16 ms
Spencer, IA	07-16-13	2:57pm	51301	12Mbps/3Mbps	16.045Mbps/2.982Mbps	10.17Mbps/2.43Mbps	700 milliseconds	751 ms	653 ms	14ms
Spirit Lake, IA	07-16-13	3:47pm	51360	12Mbps/3Mbps	27.951Mbps/3.017Mbps	09.42Mbps/1.95Mbps	700 milliseconds	799 ms	688 ms	16 ms
Estherville, IA	07-16-13	5:22pm	51334	12Mbps/3Mbps	20.940Mbps/3.111Mbps	10.49Mbps/2.16Mbps	700 milliseconds	789 ms	691 ms	20 ms
Cylinder, IA	07-16-13	6:34pm	50528	12Mbps/3Mbps	20.496Mbps/3.259Mbps	12.3Mbps/2.64Mbps	700 milliseconds	769 ms	663 ms	13 ms
Bancroft, IA	07-16-13	7:41pm	50517	12Mbps/3Mbps	20.400Mbps/3.173Mbps	11.28Mbps/2.5Mbps	700 milliseconds	793 ms	687 ms	16 ms
Cherokee, IA	07-17-13	10:15am	51012	12Mbps/3Mbps	15.492Mbps/2.881Mbps	10.92Mbps/2.44Mbps	700 milliseconds	790 ms	678 ms	09 ms
Salix, IA	07-17-13	1:08pm	51052	12Mbps/3Mbps	22.036Mbps/3.142Mbps	11.77Mbps/2.71Mbps	700 milliseconds	762 ms	657 ms	20 ms
LeMars, IA	07-17-13	2:39pm	51031	12Mbps/3Mbps	12.433Mbps/2.565Mbps	11.27Mbps/2.48Mbps	700 milliseconds	739 ms	679 ms	05 ms
Hawarden, IA	07-17-13	4:37pm	51023	12Mbps/3Mbps	28.594Mbps/2.081Mbps	10.05Mbps/1.95Mbps	700 milliseconds	789 ms	680 ms	05 ms
Beresford, SD	07-17-13	5:35pm	57004	12Mbps/3Mbps	20.139Mbps/3.058Mbps	12.03Mbps/2.63Mbps	700 milliseconds	781 ms	692 ms	16 ms
Madison, SD	07-19-13	4:42pm	57042	12Mbps/3Mbps	22.003Mbps/3.197Mbps	8.17 Mbps/2.08Mbps	700 milliseconds	775 ms	671 ms	07 ms

Note: Connect Iowa and Connect Minnesota speed tests utilize OOKLA Speed Test Services.