

Colorado Broadband Data & Development Program

April 1, 2011 Data Delivery Report

For details about the Colorado Broadband Data and Development Program (CBDDP), please see our web site at www.colorado.gov/oit/broadband or visit the National Broadband Map at www.broadbandmap.gov.

Purpose of this Report

The report provides details about a specific data set delivered to the NTIA on April 1, 2011 to support the National Broadband Map. The report describes the various processes used to verify this data set and the results of those processes. The report also describes, in general terms, how CBDDP collects and validates information about broadband availability in the State of Colorado.

Status of Data Collection

The Colorado Broadband Data and Development Program continued the data collection effort begun with signing a data collection contract on March 22, 2010. Data has been collected from almost all service providers of significant size, but effort will continue to capture data from those not yet reporting.

The following table categorizes all possible broadband service providers in Colorado known to CBDDP, and indicates the status of their participation in the program. The table also shows progress made over the first three data deliveries to the National Telephone and Information Administration (NTIA). See the Data Delivery Report at the end of this document for more details on the data.

Service Providers	May 21, 2010	October 1, 2010	April 1,2011
Identified	102	158	161
Duplicates	0	14	14
Not a BB Provider	15	24	29
Working Universe of SP's	87	120	118
Multiple Contact Efforts, Have Chosen Not to Participate So Far, May Not Be a Provider	5	17	50
Data Sets Delivered to NTIA	39	59	65*
Broadband Provider Status Not Yet Known	43	44	0
* Data Received but Not Included in Data Set: 1 Provider that Missed the Cutoff, and 2 Satellite Providers that Report They Cover the Entire State			

The following table describes how many service providers updated their data between the prior and current data delivery.

Service Provider Updates	April 1, 2011
New in Data Set	6
Updated Data	16
Responded "No Data Change"	37
Responded Update Not Received	3
No Response	3
Data Sets Delivered to NTIA	65

The following table shows the number of community anchor institutions that have been identified in the state, and how many CAIs for which some broadband information has been collected and included in this data set. In addition, the "Includes Speed Tests" column shows how much of the data in the "Collected" column are actual speed tests.

CBDDP is very pleased with the progress that has been made in promoting speed tests among reporting CAIs. As shown below, 42%, or 1,562 of 3,768, of the data collected for CAI's is from speed tests. An additional 526 CAIs have reported speed tests since October 1.

Community Anchor Institutions	October 1, 2010				April 1, 2011		
	Identified	Collected	Includes Speed Test		Identified	Collected	Includes Speed Test
Cat. 1 - School K -12	2097	1927	665		2106	1995	904
Cat. 2 - Library	246	234	0		252	272	10
Cat. 3 - Medical/Healthcare	694	275	80		709	364	140
Cat. 4 - Public Safety	1813	548	264		1778	774	299
Cat. 5 - University/College	102	23	21		54	43	41
Cat. 6 - Other Government	407	156	6		597	315	165
Cat. 7 - Other non-Government	0	0	0		7	5	3
	5359	3163	1036		5503	3768	1562

Validation and Verification Processes for the April 2011 Data Set

1. **Automated Validation.** CBDDP has been developing and improving automated validation scripts since its first data delivery in May 2010. CBDDP runs both the scripts it has developed as well as the script provided by the NTIA on a monthly basis. Proof that the data delivery passed the NTIA validation script is submitted with the data delivery as required.

In addition to testing everything that the NTIA script tests, CBDDP's automated script:

- Verifies that the Geodatabase has metadata, is in the correct projection, and that the feature classes are properly named
- Verifies all columns are properly named and defined
- Verifies all table value domains are adhered to
- Captures the required information to accurately complete the Records Count and Provider Table tabs for the SDBB Data Package
- Cross references and creates statistical tables technology type and valid speed combinations for both Service Provider and CAI data
- Compares FRN to provider name to ensure consistency across the data set
- Ensures consistency in provider names
- Identifies possible duplicates among CAIs
- Tests all feature classes to ensure they are within the State's boundaries
- Creates a statistical table for all features classes including records details, service provider information and attribution frequencies
- Ensures the data model, business rules and schema are in compliance

2. **Analysis of Changes.** CBDDP has compared the October 1, 2010 and April 1, 2011 data sets for all providers. See the table below which lists only providers with changes. In instances where coverage areas were reduced, 15% of the reduced features for each provider were traced back to the provider's raw data. No errors were found in that data conversion. 80% of the features added to existing providers and new providers were compared to the raw data. Again, no errors were found in the data conversion. In total, over 80,000 new, additional and reduced features were compared back to the raw data during our analysis.

3. Visual review.

The coverage areas for new service providers and those with changes to their coverage areas were visually reviewed. No unusual coverage areas were observed.

Difference Between October 2010 and April 2011 Deliveries by Feature Type						
Company Name	Doing Business As	Census	Roads	Wireless	Mid Mile	Total
New Providers						
Eschelon Telecom of Colorado, Inc.	Integra Telecom	49491	29683	0	0	79174
CSC Holdings, LLC	Bresnan Communications	14115	24550	0	0	38665
Cogent Communications, Inc.	Cogent Communications, Inc.	74	0	0	0	74
Grand County Internet Services, Inc.	Grand County Internet Services	0	0	1	1	2
Farmers Telephone Company	Farmers Telecommunications	0	0	1	0	1
Viaero Wireless	Viaero Wireless	0	0	1	0	1
Providers with Additional Features						
Level 3 Communications, LLC	Level 3 Communications, LLC	0	0	0	173	173
New Edge Holding Company	New Edge Networks, Inc.	148	-8	0	0	140
Time Warner Cable	Time Warner Cable	80	28	0	0	108
Dubois Telephone Exchange, Inc.,	DTE	7	72	0	0	79
tw telecom inc.	tw telecom inc.	24	4	0	0	28
Strasburg Telephone Company	TDS Telecom	-1	22	0	0	21
Sprint Nextel Corporation	Sprint	0	0	1	0	1
T-Mobile USA, Inc.	T-Mobile	0	0	1	0	1
Providers with Less Features						
DIECA Communications, Inc.	Covad Communications Company	-507	-5318	0	0	-5825
CenturyTel, Inc.	CenturyTel, Inc.	643	-6406	0	0	-5763
Qwest Corporation	Qwest Corporation	753	-3062	0	0	-2309
Delta County Tele-comm, Inc.	TDS Telecom	-60	-798	0	0	-858
Brainstorm Internet	Brainstorm Internet	0	0	-3	0	-3
J.e.d. Enterprises, Inc.	J.e.d. Enterprises, Inc.	0	-2	0	0	-2

4. **Third Party Data Validation.** Since the October 1, 2010 data delivery, 100% of the service provider coverage areas have been compared to third party data sets. Data sets include American Roamer, ComSearch, Pitney Bowes, MediaPrints, and SpectrumView. In 21 instances, multiple third party data sets were used to validate a single service provider/technology type combination. During the comparison, comments are recorded about coverage areas, geometry and attribution provided for the technology type, and a confidence level is assigned. As a result of discrepancies between the data sets and data from providers, discussions have been held with six providers. In all instances, the providers confirmed their data was correct. After the discussions, an additional confidence level is assigned. Over the next few months, the project will contact an additional eight providers to verify their data.

5. **Feedback loop.** All service providers have been given the opportunity to review the geospatial representation of their data. In addition, when updates to data were solicited, providers were questioned as to the accuracy of the geospatial display of their coverage areas. Approximately six providers have asked questions or provided feedback.

6. Speed Test Analysis. There are several issues to consider when comparing speed test data to service provider advertized maximum speeds. Many speed tests do not collect the name of the service provider being tested. In areas where more than one service provider offers varying maximum service speeds, it is not possible to know who is providing the service to the CAI. Also, even if a speed test result is directly tied to a certain service provider, it is unknown if the customer has chosen to purchase the maximum available speed offered by the service provider.

The speed test information CBDDP collects from CAIs requests the name of the service provider. Although CBDDP has collected speeds tests from 1,562 CAIs as noted in the table on Page 2, only 446 of those tests specifically identified the service provider. Service providers report data by speed test tier, and the following table compares how the speed tier for the CAI speed test compares to the maximum advertized speed tier provided by the service provider.

CAI Speed Test (Where Service Provider (SP) is Identified) Compared to SP Max. Adv. Down													
	Speed Test Slower						Speed Test Equals	Speed Test Faster					Total Speed Tests
Number of Speed Tiers Slower or Faster	-6	-5	-4	-3	-2	-1	0	1	2	3	4	5	
School K - 12			5	2 6	2 7	59	35	24	1	7	2	1	197
Library							1	1					2
Healthcare			2	3	4	5	6	2	3	2	1		28
Public Safety	1	1	1	1	6	37	44	17	7	4	1		130
University, college		1	1	2	4	6	2	1	1				18
Other Government	1	1	1	8	3	19	18	13	4	3			71
Other Non-Government													0
Totals	2	3	0	5 0	4 4	12 6	106	58	2 6	1 6	4	1	446
Totals	235						106	105					446

7. Drive Testing Mobile Coverage Areas. CBDDP is testing the mobile wireless coverage areas reported by the service providers. The combined coverage areas of all wireless provider data indicates 95.9% of the square miles in the state have available speeds of greater than 3 Mbps and less than 6 Mbps, and that only 3.9% of the square miles had less than 768 Kbps.

CBDDP has developed a drive test plan that will drive over 5,000 miles of roads. Primary test points are selected along major highways. Secondary points are then tested from one half to one mile away from the primary point to confirm the result of the primary point. Up to four derived points are tested or until at least two tests fail with test speeds of less than 768 Kbps. The tests are all taken via commercially available wireless air cards, identical laptops, and at the same FCC speed test site. Only the major national providers are being tested. The primary points are generally 10 to 15 miles apart, and the derived points are clustered around the A points within 2 to 3 miles.

The following table presents the results of drive testing completed through March 3, 2011. This includes five days of testing for two people and covered 2,300 miles. CBDDP estimates there are approximately six days of testing to be complete the planned route. Test results are shown only for points that fall within the coverage area provided by the service providers to CBDDP.

MOBILE WIRLESS COVERAGE TESTING									
All Points Tested Including Primary and Derived									
Combined Result for Three Providers Tested									
	Tiers Slower				Same Tier	Tiers Faster			Total Tests
Number of Speed Tiers Slower or Faster	< 768 Kbps	-3	-2	-1	0	1	2	3	
	302		60	29	111	14	1		517
Totals	391				111	15			517
ATT									
	Tiers Slower				Same Tier		Tiers Faster		Total
Number of Speed Tiers Slower or Faster	< 768 Kbps	-3	-2	-1	0	1	2	3	
	79			29	11				119
Totals	108				11	0			119
Sprint									
		Tiers Slower			Same Tier		Tiers Faster		Total
Number of Speed Tiers Slower or Faster	< 768 Kbps	-3	-2	-1	0	1	2	3	
	85		1		100	14	1		201
Totals	86				100	15			201
Verizon									
			Tiers Slower		Same Tier		Tiers Faster		Total

Number of Speed Tiers Slower or Faster	< 768 Kbps	-3	-2	-1	0	1	2	3	
	138		59						197
Totals	197				0	0			197
Primary Points Tested									
Combined Result for Three Providers Tested									
		Tiers Slower			Same Tier	Tiers Faster			Total
Number of Speed Tiers Slower or Faster	< 768 Kbps	-3	-2	-1	0	1	2	3	
	34		16	9	29	3	1		92
Totals	59				29	4			92
ATT									
		Tiers Slower			Same Tier		Tiers Faster		Total
Number of Speed Tiers Slower or Faster	< 768 Kbps	-3	-2	-1	0	1	2	3	
	10			9	2				21
Totals	19				2	0			21
Sprint									
		Tiers Slower			Same Tier		Tiers Faster		Total
Number of Speed Tiers Slower or Faster	< 768 Kbps	-3	-2	-1	0	1	2	3	
	1		1		27	3	1		33
Totals	2				27	4			33
Verizon									
			Tiers Slower		Same Tier		Tiers Faster		Total
Number of Speed Tiers Slower or Faster	< 768 Kbps	-3	-2	-1	0	1	2	3	
	23		15						38
Totals	38				0	0			38

8. Demographic Analysis.

Using the October 1, 2010 data delivered to the NTIA, CBDDP completed an analysis of unserved (available broadband less than 768 Kbps downstream) and underserved (available broadband less than 3 Mbps downstream). The analysis was broken down by wireline, fixed wireless and mobile wireless. Availability analysis was completed at the census block level, and then aggregated to counties. This effort allowed the project team to validate the population numbers presented by the National Broadband Map. CBDDP believes the National Broadband Map accurately reflects served populations based on 2009 Census Data.

Planned Data Verification and Analysis

CBDDP has prepared a Survey Plan for residences. The plan should be implemented in Q2 and Q3 and results used to validate, where possible, service provider information about availability. A business survey is also under development.

Summary of Process

CBDDP follows a data collection process outlined on the National Broadband Map in the “Technical Overview” of the “About” section at www.broadbandmap.gov. If you would like a more detailed, procedural description of the process, please contact CBDDP via email at COBroadband@state.co.us.

The data gathering process begins by contacting the potential broadband providers. Although participation is voluntary, many providers choose to support this effort. The success of this program rests, in part, on that support, and we appreciate their efforts to participate in this program. Broadband providers submit data in a variety of formats, and in a number of cases, CBDDP also conducts technical assistance to support the efforts of smaller providers to participate. For census blocks less than two square miles, the entire census block is presumed to have coverage if any service provider reports broadband anywhere in the census block. For census blocks greater than two square miles, service is reported along road segments. Before submitting data to NTIA, CBDDP integrates the data from each provider into a single dataset using a Data Model required by the NTIA. NTIA and the FCC then integrate CBDDP’s dataset along with those from all other states into the single National Broadband Map dataset.

An earlier section in this report titled “Data Verification and Analysis”, describes the specific steps that CBDDP took, and the results of those steps, to verify the data before transmission to the NTIA.

The CBDDP has implemented the following data collection and ingestion processes which may vary from other state programs.

1. To spatially represent broadband service where the service provider has given CBDDP address specific information, CBDDP implemented the following process starting with the October 2010 data delivery. A 150 foot buffer is drawn around each point. Any census block touched by the buffered area is selected. For census blocks greater than two square miles, any road segment touched by the buffer is selected. CBDDP has met with the largest service provider in the state that provided address specific data, and they agree that the 150 foot buffer process is reasonable and creates an accurate representation of their service area.
2. Based on clarifications from the NTIA, CBDDP did not provide any features in the BB_Service_Overview feature class since more granular speed information was provided in the BB_Service_CensusBlock, BB_Service_RoadSegment and BB_Service_Address feature classes.
3. CBDDP is not currently collecting pricing information.
3. Reference layers include the U.S Census Bureau 2000 census blocks and 2009 Tiger data for roads.
4. CBDDP made a significant adjustment to the data set starting with the October 2010 data delivery. Very few of Colorado's service providers have reported both their maximum advertized speed and the typical speeds a user might encounter. During an in-person meeting, Qwest stated their advertised speeds are the typical speeds and there is no potential for degraded service during peak periods of use or distance from central office. Based on this information from the service provider, CBDDP is using Qwest advertised as typical speed.
5. CBDDP has created an exception table that will record unusual areas or pockets where coverage may or may not exist. The table will be persistent through provider updates, so these exceptions will not have to be rediscovered with each update.
6. CBDDP reports wireless towers in the Middle-Mile where they are being used for backhaul. When service providers have submitted central office locations, they are included in the middle mile. Qwest and Century did not provide such information, and have requested CBDDP not include publicly available central office locations in the data set.
7. CBDDP is utilizing a data collection contractor during the first two years of the program. Starting October 1, 2011, and through the remainder of the program to October 31, 2014, CBDDP will bring this process in-house. CBDDP has worked closely with the contractor, and has developed skills and experience in validating the information and working with the data sets. It is expected this will be a seamless transition.
8. For CAIs, multiple data sources are compared where available. However, speed test data is reported in preference to other types of data such as surveys, reports or speeds for which the CAI is paying.

9. Addresses and names that appear to be duplicates are validated. CBDDP chooses to report multiple CAIs at the same address as distinct entities. For example, a county sheriff's office and a 911 call center at the same address are reported as two distinct entities.

Data Summary and Feature Class Statistical Tables

Data Summary			
File Summary			
File Type		Number of Records	
Total Records in all Files		479862	
Census Block < 2 sq. miles		305575	
Street Segments		167424	
Wireless Shape File		42	
Service Address		399	
BB Service Overview		0	
Community Anchor Institutions		5503	
Middle Mile		919	
Metadata Provided for Geospatial Data		Yes	
Provider Information			
File Type		Number of Records	
Number of ISPs Provided		65	

Census Blocks < 2 sq. miles

Data Type				Code	Data Element	Count	%	
Records Details		Total Records				3E+05		
		Census Blocks < 2 sq. miles with Broadband				98940		
		Census Blocks < 2 sq. miles in State (with & without broadband)				131655		
		Census Blocks > 2 sq. miles in the State (with & without broadband)				65205		
		in the State (with & without broadband)				141040		
Service Provider Details		Providers				36		
		Number of Distinct "Doing Business As"				33		
		FRN				36		
Technology	10	Asymmetric xDSL	####			47.7%		
	20	Symmetric xDSL	41477			13.6%		
	30	Wireless	55031			18.0%		
	40	DOCSIS 3.0	0			0.0%		
	41	Cable Modem-Other	62614			20.5%		
	50	Optical Carrier/Fiber	711			0.2%		
	60	Satellite	0			0.0%		
	70	Terrestrial Fixed Wireless-Unlicensed	0			0.0%		
	71	Terrestrial Fixed Wireless-Licensed	0			0.0%		
	80	Wireless	0			0.0%		
	90	Electrical Power Line	0			0.0%		
	0	Other	0			0.0%		
	Max. Advertised Download Speed	3	> 768 kps, < 1.5 mbps.	7190			2.4%	
4		> 1.5 mbps, < 3 mbps.	56521			18.5%		
5		> 3 mbps, < 6 mbps.	67773			22.2%		
6		> 6 mbps, < 10 mbps.	1E+05			38.1%		
7		> 10 mbps, < 25 mbps.	35704			11.7%		
8		> 25 mbps, < 50 mbps.	21433			7.0%		
9		> 50 mbps, < 100 mbps	124			0.0%		
10		> 100 mbps, < 1 gbps.	473			0.2%		
11		> 1 gbps.	35			0.0%		
Data Type				Code	Data Element	Count	%	
Typical Download Speed	3	> 768 kps, < 1.5 mb	13500			4.4%		
	4	> 1.5 mbps, < 3 mb	52275			17.1%		
	5	> 3 mbps, < 6 mbps	83049			27.2%		
	6	> 6 mbps, < 10 mbp	49536			16.2%		
	7	> 10 mbps, < 25 mb	20723			6.8%		
	8	> 25 mbps, < 50 mb	21393			7.0%		
	9	> 50 mbps, < 100 m	48			0.0%		
	10	> 100 mbps, < 1 gb	0			0.0%		
	11	> 1 gbps.	0			0.0%		
		N/A "null"	65051			21.3%		
Data Type				Code	Data Element	Count	%	
Max. Advertised Upload Speed	2	>200 kps, < 768 kp	38018			12.4%		
	3	> 768 kps, < 1.5 mb	147148			48.2%		
	4	> 1.5 mbps, < 3 mb	38916			12.7%		
	5	> 3 mbps, < 6 mbps	62478			20.4%		
	6	> 6 mbps, < 10 mbp	2016			0.7%		
	7	> 10 mbps, < 25 mb	16307			5.3%		
	8	> 25 mbps, < 50 mb	60			0.0%		
	9	> 50 mbps, < 100 m	124			0.0%		
	10	> 100 mbps, < 1 gb	473			0.2%		
	11	> 1 gbps.	35			0.0%		
Data Type				Code	Data Element	Count	%	
Typical Upload Speed	2	>200 kps, < 768 kp	60580			19.8%		
	3	> 768 kps, < 1.5 mb	60983			20.0%		
	4	> 1.5 mbps, < 3 mb	38460			12.6%		
	5	> 3 mbps, < 6 mbps	62248			20.4%		
	6	> 6 mbps, < 10 mbp	2008			0.7%		
	7	> 10 mbps, < 25 mb	16177			5.3%		
	8	> 25 mbps, < 50 mb	20			0.0%		
	9	> 50 mbps, < 100 m	48			0.0%		
	10	> 100 mbps, < 1 gb	0			0.0%		
	11	> 1 gbps.	0			0.0%		
		N/A "null"	65051			21.3%		

Street Segment									
Data Type	Code	Data Element	Count	%	Data Type	Code	Data Element	Count	%
Record		Total Records	####		Typical Download Speed	3	> 768 kps, < 1.5 mb	9736	5.8%
Service s Provider Details	Providers		35			4	> 1.5 mbps, < 3 mb	65342	39.0%
	Number of Distinct "Doing Business As"		32			5	> 3 mbps, < 6 mbps	14294	8.5%
	FRN		35			6	> 6 mbps, < 10 mbp	14456	8.6%
Technology	10	Asymmetric xDSL	95232	56.9%		7	> 10 mbps, < 25 mb	13819	8.3%
	20	Symmetric xDSL	22875	13.7%		8	> 25 mbps, < 50 mb	2413	1.4%
	30	Wireless	14248	8.5%		9	> 50 mbps, < 100 m	0	0.0%
	40	DOCSIS 3.0	0	0.0%		10	> 100 mbps, < 1 gb	0	0.0%
	41	Cable Modem-Other	34893	20.8%		11	> 1 gbps.	0	0.0%
	50	Optical Carrier/Fiber	176	0.1%		N/A "null"		47363	28.3%
	60	Satellite	0	0.0%	Max. Advertised Upload Speed	2	>200 kps, < 768 kp	33270	19.9%
	70	Terrestrial Fixed Wireless-Unlicensed	0	0.0%		3	> 768 kps, < 1.5 mb	50156	30.0%
	71	Terrestrial Fixed Wireless-Licensed	0	0.0%		4	> 1.5 mbps, < 3 mb	36839	22.0%
	80	Wireless	0	0.0%		5	> 3 mbps, < 6 mbps	20436	12.2%
	90	Electrial Power Line	0	0.0%		6	> 6 mbps, < 10 mbp	430	0.3%
	0	Other	0	0.0%		7	> 10 mbps, < 25 mb	26282	15.7%
Max. Advertised Download Speed	3	> 768 kps, < 1.5 mbps.	8412	5.0%		8	> 25 mbps, < 50 mb	0	0.0%
	4	> 1.5 mbps, < 3 mbps.	66365	39.6%		9	> 50 mbps, < 100 m	0	0.0%
	5	> 3 mbps, < 6 mbps.	24980	14.9%		10	> 100 mbps, < 1 gb	11	0.0%
	6	> 6 mbps, < 10 mbps.	25394	15.2%		11	> 1 gbps.	0	0.0%
	7	> 10 mbps, < 25 mbps.	15298	9.1%	Typical Upload Speed	2	>200 kps, < 768 kp	33787	20.2%
	8	> 25 mbps, < 50 mbps.	2413	1.4%		3	> 768 kps, < 1.5 mb	36031	21.5%
	9	> 50 mbps, < 100 mbps	24550	14.7%		4	> 1.5 mbps, < 3 mb	36570	21.8%
	10	> 100 mbps, < 1 gbps.	11	0.0%		5	> 3 mbps, < 6 mbps	11511	6.9%
	11	> 1 gbps.	0	0.0%		6	> 6 mbps, < 10 mbp	430	0.3%
						7	> 10 mbps, < 25 mb	1732	1.0%
						8	> 25 mbps, < 50 mb	0	0.0%
						9	> 50 mbps, < 100 m	0	0.0%
						10	> 100 mbps, < 1 gb	0	0.0%
						11	> 1 gbps.	0	0.0%
						N/A "null"		47363	28.3%

Wireless

Data Type	Code	Data Element	Count	%	Data Type	Code	Data Element	Count	%
Record		Total Records	42						
Service s Provider Details		Providers	33		Typical Download Speed	2	>200 kps, < 768 kps	0	0.0%
		Number of Distinct "Doing Business As"	32			3	> 768 kps, < 1.5 mbps	11	26.2%
		FRN	29			4	> 1.5 mbps, < 3 mbps	6	14.3%
						5	> 3 mbps, < 6 mbps	10	23.8%
Technology	10	Asymmetric xDSL	0	0.0%		6	> 6 mbps, < 10 mbps	1	2.4%
	20	Symmetric xDSL	0	0.0%		7	> 10 mbps, < 25 mbps	0	0.0%
	30	Wireless	0	0.0%		8	> 25 mbps, < 50 mbps	0	0.0%
	40	DOCSIS 3.0	0	0.0%		9	> 50 mbps, < 100 mbps	0	0.0%
	41	Cable Modem-Other	0	0.0%		10	> 100 mbps, < 1 gbps	0	0.0%
	50	Optical Carrier/Fiber	0	0.0%		11	> 1 gbps	0	0.0%
	60	Satellite	0	0.0%			N/A "null"	14	33.3%
	70	Terrestrial Fixed Wireless-Unlicensed	14	33.3%	Max. Advertised Upload Speed	2	>200 kps, < 768 kps	4	9.5%
	71	Terrestrial Fixed Wireless-Licensed	13	31.0%		3	> 768 kps, < 1.5 mbps	21	50.0%
	80	Wireless	15	35.7%		4	> 1.5 mbps, < 3 mbps	10	23.8%
	90	Electrical Power Line	0	0.0%		5	> 3 mbps, < 6 mbps	6	14.3%
	0	Other	0	0.0%		6	> 6 mbps, < 10 mbps	1	2.4%
Max. Advertised Download Speed	3	> 768 kps, < 1.5 mbps	8	19.0%		7	> 10 mbps, < 25 mbps	0	0.0%
	4	> 1.5 mbps, < 3 mbps	10	23.8%		8	> 25 mbps, < 50 mbps	0	0.0%
	5	> 3 mbps, < 6 mbps	20	47.6%		9	> 50 mbps, < 100 mbps	0	0.0%
	6	> 6 mbps, < 10 mbps	4	9.5%		10	> 100 mbps, < 1 gbps	0	0.0%
	7	> 10 mbps, < 25 mbps	0	0.0%		11	> 1 gbps	0	0.0%
	8	> 25 mbps, < 50 mbps	0	0.0%	Typical Upload Speed	2	>200 kps, < 768 kps	8	19.0%
	9	> 50 mbps, < 100 mbps	0	0.0%		3	> 768 kps, < 1.5 mbps	15	35.7%
	10	> 100 mbps, < 1 gbps	0	0.0%		4	> 1.5 mbps, < 3 mbps	3	7.1%
	11	> 1 gbps	0	0.0%		5	> 3 mbps, < 6 mbps	2	4.8%
Spectrum	1	800 Mhz Spectrum Use	3	7.1%		6	> 6 mbps, < 10 mbps	0	0.0%
	2	700 Mhz Spectrum Use	3	7.1%		7	> 10 mbps, < 25 mbps	0	0.0%
	3	1900 Mhz Spectrum Use	4	9.5%		8	> 25 mbps, < 50 mbps	0	0.0%
	4	1700 Mhz Spectrum Use	5	11.9%		9	> 50 mbps, < 100 mbps	0	0.0%
	5	2500 Mhz Spectrum Use	4	9.5%		10	> 100 mbps, < 1 gbps	0	0.0%
	6	Unlicensed Spectrum Use	21	50.0%		11	> 1 gbps	0	0.0%
	7	Specialist Mobile Radios	2	4.8%			N/A "null"	14	#DIV/0!
	8	Wireless Communication	0	0.0%					
	9	Satellite	0	0.0%					

Middle Mile											
Data Type						Data Type					
Code		Data Element		Count %		Code		Data Element		Count %	
Service s Provider Details	Record		Total Records	919		Facility Type	1	Fiber	473	51.5%	
					2		Copper	5	0.5%		
			Providers	37			3	Hybrid Fiber Coax	1	0.1%	
			Number of Distinct "Doing Business As"	33			4	Wireless	440	47.9%	
			FRN	36				N/A "null"	0	0.0%	
Ownership	0	Owned	112	12.2%	Lat / Lon g		State	919	100%		
	1	Leased	807	87.8%			Total Lat/Long	919			
Facility Capacity	1	Multiple T1's and less than 40 mbps.	409	44.5%	Elevation		Number of Data Points	783			
	2	and less than 150 mbps.	87	9.5%			Lowest Elevation	5			
	3	mbps. and less than 600 mbps.	43	4.7%			Highest Elevation	225			
	4	mbps. and less than 2.4 gbps.	15	1.6%							
	5	gbps. and less than 10 gbps.	2	0.2%							
	6	Greater than 10 gbps	363	39.5%							

Community Anchor Institution

Data Type	Code	Data Element	Count	%	Data Type	Code	Data Element	Count	%	
Record		Total Records	5503							
Anchor Category	1	School-K through 12	2106	38.3%	Max. Advertised Upload Speed	1	< 200 kbps.	0	0.0%	
	2	Library	252	4.6%		2	>200 kbps, < 768 kbps.	113	2.1%	
	3	Medical/healthcare	709	12.9%		3	> 768 kbps, < 1.5 mbps.	190	3.5%	
	4	Public safety	1778	32.3%		4	> 1.5 mbps, < 3 mbps.	1337	24.3%	
	5	University, college, other post-secondary	54	1.0%		5	> 3 mbps, < 6 mbps.	432	8.9%	
	6	Other community support-fgov't	597	10.8%		6	> 6 mbps, < 10 mbps.	394	7.2%	
	7	Other community support-non-fgov't	7	0.1%		7	> 10 mbps, < 25 mbps.	661	12.0%	
						8	> 25 mbps, < 50 mbps.	90	1.6%	
Technology	10	Asymmetric xDSL	343	6.2%		9	> 50 mbps, < 100 mbps.	8	0.1%	
	20	Symmetric xDSL	6	0.1%		10	> 100 mbps, < 1 gbps.	55	1.0%	
	30	Other Copper Wireline	1531	28.9%		11	> 1 gbps.	70	1.3%	
	40	Cable Modem-DOCSIS 3.0	0	0.0%			N/A "null"	2033	38.0%	
	41	Cable Modem-Other	123	2.3%	Y/N Broadband Service	Y	Yes-Subscriber to Service	3410	62.0%	
	50	Optical Carrier/Fiber	1236	22.5%		N	No-Does Not Subscribe to	180	3.3%	
	60	Satellite	14	0.3%		U	Unknown	1913	34.8%	
	70	Terrrestrial Fixed Wireless-Unlicensed	27	0.5%	Lat/Long Accuracy	1	Lat/Long tht File within the State	5503		
	71	Terrrestrial Fixed Wireless-Licensed	64	1.2%		2	Total Lat/Long	5503	100%	
	80	Wireless	0	0.0%	Anchor Names	Total Count				
	90	Electrical Power Line	0	0.0%		Anchor Name		5503		
	0	Other	0	0.0%	Distinct Count of Anchor Name		5356			
		N/A "null"	2033	38.0%						
Max. Advertised Download Speed	1	< 200 kbps.	0	0.0%	Community Anchor Institution Category Count with Broadband Information	1	12	2106	1363	
	2	>200 kbps, < 768 kbps.	0	0.0%		2	Library	252	210	
	3	> 768 kbps, < 1.5 mbps.	197	3.6%		3	re	709	326	
	4	> 1.5 mbps, < 3 mbps.	1339	24.3%		4	Public safety	1778	562	
	5	> 3 mbps, < 6 mbps.	415	7.5%		5	University, college, other	54	43	
	6	> 6 mbps, < 10 mbps.	266	4.8%		6	Other community support-fgov't	597	297	
	7	> 10 mbps, < 25 mbps.	305	16.4%		7	Other community support-non-	7	3	
	8	> 25 mbps, < 50 mbps.	153	2.8%			Totals	5503	3410	
	9	> 50 mbps, < 100 mbps.	10	0.2%						
	10	> 100 mbps, < 1 gbps.	55	1.0%						
	11	> 1 gbps.	70	1.3%						
		N/A "null"	2033	38.0%						

Distinct Speed Tiers Provided

Technology Codes		Allowable		Speed Tier Codes	
		Down	Up		
10	Asymmetric xDSL	3 to 8	2 to 7	1	< 200 kbps.
20	Symmetric xDSL	3 to 8	3 to 8	2	> 200 kbps, < 768 kbps.
30	Other Copper Wireline	3 to 8	2 to 8	3	> 768 kbps, < 1.5 mbps.
40	Cable Modem-DOCSIS 3.0	3 to 7	2 to 7	4	> 1.5 mbps, < 3 mbps.
41	Cable Modem-Other	3 to 9	2 to 9	5	> 3 mbps, < 6 mbps.
50	Optical Carrier/Fiber to End User	3 to 11	2 to 11	6	> 6 mbps, < 10 mbps.
60	Satellite	3 to 6	2 to 6	7	> 10 mbps, < 25 mbps.
70	Terrrestrial Fixed Wireline-Unlicensed	3 to 6	2 to 6	8	> 25 mbps, < 50 mbps.
71	Terrrestrial Fixed Wireline-Licensed	3 to 6	2 to 6	9	> 50 mbps, < 100 mbps.
80	Terrrestrial Mobile Wireline	3 to 6	2 to 6	10	> 100 mbps, < 1 gbps.
90	Electric Power Line	3 to 6	2 to 6	11	> 1 gbps.
0	All Other	3 to 11	2 to 11		

Maximum Advertised Speed				Typical Speed			
Technology	Download	Upload	Freq.	Technology	Download	Upload	Freq.
10	3	2	2633	10	NULL	NULL	15576
10	3	3	7375	10	3	2	11135
10	4	2	26860	10	3	3	6729
10	4	3	36538	10	4	2	23888
10	5	2	4297	10	4	3	34277
10	5	3	10074	10	5	2	21846
10	5	4	571	10	5	3	6841
10	5	5	10171	10	5	5	1090
10	6	2	37498	10	6	2	37498
10	6	3	47046	10	6	3	24065
10	7	3	19486	10	7	3	19486
10	7	4	14757	10	7	4	14757
10	8	5	5929	10	8	5	5585
10	8	7	17857	10	8	7	11290
20	3	3	5297	20	3	3	5297
20	4	4	51003	20	4	4	51003
20	5	5	8052	20	5	5	8052
30	3	3	297	30	NULL	NULL	673
30	4	4	8603	30	3	3	75
30	5	5	58762	30	4	4	8449
30	6	6	1375	30	5	5	58686
30	7	7	182	30	6	6	1326
30	8	8	60	30	7	7	50
41	5	4	582	30	8	8	20
41	6	3	54727	41	NULL	NULL	95615
41	6	6	1071	41	5	4	582

41	7	3	16338		41	6	6	1071
41	7	4	239		41	7	4	239
50	5	3	244		50	NULL	NULL	550
50	9	9	124		50	5	3	244
50	10	10	484		50	5	5	2
50	11	11	35		50	6	6	33
70	3	3	1		50	7	6	8
70	4	3	2		50	7	7	2
70	4	4	1		50	9	9	48
70	5	2	1		70	NULL	NULL	4
70	5	3	4		70	3	3	1
70	5	4	1		70	4	3	2
70	5	5	3		70	5	2	1
70	6	2	1		70	5	3	3
71	3	3	4		70	5	4	1
71	4	3	1		70	5	5	2
71	4	4	2		71	NULL	NULL	5
71	5	3	3		71	3	3	4
71	5	5	2		71	4	3	1
71	6	6	1		71	4	4	1
80	3	2	1		71	5	3	2
80	3	3	2		80	NULL	NULL	5
80	4	2	1		80	3	2	6
80	4	3	3		80	4	2	1
80	5	3	1		80	4	3	1
80	5	4	5		80	5	3	1
80	6	4	1		80	6	4	1
80	6	5	1					