

# Colorado Broadband Data & Development Program

## April 1, 2012 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](http://www.colorado.gov/oit/broadband) or visit the National Broadband Map at [www.broadbandmap.gov](http://www.broadbandmap.gov). The Colorado interactive broadband map is available at <http://maps.co.gov/ColoradoBroadband>.

### Purpose of this Report

This report provides details about the data set delivered to the NTIA on April 1, 2012 to support the National Broadband Map and to meet the requirements of the State Broadband Data and Development Program grant to the Governor's Office of Information Technology (OIT). The report describes the various processes used to verify this data set and the results of those processes. It also describes, in general terms, how the CBDDP collects and validates information about broadband availability in the State of Colorado.

### Status of Data Collection

The Colorado Broadband Data and Development Program data collection effort began with a third party contractor through a data collection contract signed on March 22, 2010. After the October 2011 data submission, the CBDDP data processing was brought in-house to the Governor's Office of Information Technology. OIT contacted 161 potential service providers to contribute data toward the CBDDP April 2012 delivery. Of the identified potential providers, 45 provided data updates, 7 new service providers were added to the dataset, and 17 providers declared "no data change".

The following table categorizes all possible broadband service providers in Colorado known to the CBDDP, and indicates the status of their participation in the program. The table also shows progress made over the first four 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	October 1, 2011	April 1, 2012
Potential Identified Providers	102	158	161	161	161
Data Sets Delivered to NTIA	39	59	65	71	69
Duplicates	0	14	14	14	14
Not a BB Provider	15	24	29	31	34
Working Universe of SP's	87	120	118	116	113
Multiple Contact Efforts, Have Chosen Not to Participate So Far, May Not Be a Provider	5	17	50	46	44
Broadband Provider Status Not Yet Known	43	44	0	0	0

The following table describes how many service providers updated their data between the prior and current data delivery. One dataset was removed from the previous delivery: Qwest was acquired by CenturyTel, Inc.

Service Provider Updates	April 1, 2012
New in Data Set	7
Updated Data	45
Responded "No Data Change"	17
Data Sets Delivered to NTIA	69

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.

The CBDDP is very pleased with the progress that has been made in promoting speed tests among reporting CAIs. As shown below, 46% (or 1,663 of 3,613) of the data collected for CAI's is from speed tests. The CBDDP has not significantly expanded the number of CAIs submitting speed test information between April 2011 and this delivery. However, with the hiring of new GIS staff within OIT, we expect to make a more concerted effort to collect additional CAI information or update the data collected last year.

Community Anchor Institutions	April 1, 2012		
	Identified	Collected	Includes Speed Test
Cat. 1 - School K -12	2109	1987	974
Cat. 2 - Library	252	241	14
Cat. 3 - Medical/Healthcare	709	346	143
Cat. 4 - Public Safety	1779	673	305
Cat. 5 - University/College	55	44	42
Cat. 6 - Other Government	601	315	179
Cat. 7 - Other non-Government	10	7	6
<b>TOTALS</b>	<b>5515</b>	<b>3613</b>	<b>1663</b>

*Addresses and names that appear to be duplicates are validated. The 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.*

# Validation and Verification Processes for the April 2012 Data Set

## Techniques:

1. Automated Validation
2. Analysis of Changes
3. Visual Review
4. Third Party Data Validation
5. Feedback Loop
6. CAI Speed Test Analysis
7. Drive Testing
8. FCC Speed Test Validation
9. NTIA Assessment
10. Crowd Sourcing
11. Survey

## 1. Automated Validation

The CBDDP has been developing and improving automated validation scripts since its first data delivery in May 2010. The CBDDP runs both the scripts it has developed as well as the script provided by the NTIA on a monthly basis. The data delivery includes proof that the data passed the NTIA validation script as required.

In addition to testing all of the issues covered by the NTIA script, the 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 of technology type and valid speed combinations for both Service Provider and CAI data
- Compares FRNs to provider names 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

There are three major types of data changes between the October 2011 delivery and the April 2012 delivery. First is the addition of new providers or deletion of old providers. The second type of change is that we received new data from an old provider and therefore updated the coverage. The

third type of change is from the improved process implemented by the OIT team. OIT analyzed and reprocessed all of the data provided for the last delivery by the third party contractor, Critigen, to determine the accuracy of the data. OIT's applying processing techniques more diligently than the contractor resulted in improved data for many of the providers. In some cases, OIT actually refined the processing techniques based on idiosyncrasies of individual provider's data. The following table shows the percent change of number of features from October 2011 to April 2012.

	Census Blocks		Road Segments		Wireless Service		Middle Mile	
	Number of Providers	% Features Changed	Number of Providers	% Features Changed	Number of Providers	% Features Changed	Number of Providers	% Features Changed
New providers	4	100%	3	100%	7	100%	2	100%
Deleted providers*	1	-100%	1	-100%	0	n/a	0	n/a
Received new data	17	33%	16	25%	17	35%	18	169%
Reprocessed existing data	8	5%	8	1%	13	31%	13	35%

\*The deleted provider (Qwest) was acquired by CenturyTel, Inc. and the combined data was submitted by CenturyTel

### 3. Visual Review

The CBDDP also routinely reviews the coverage areas for new service providers and those with changes to their coverage areas as part of preparing data for delivery. We found no unusual coverage areas.

### 4. Third Party Data Validation

For this data delivery, OIT has compared 100% of the service provider coverage areas to third party data sets. These data sets include American Roamer, ComSearch, Pitney Bowes, MediaPrints, and SpectrumView. 20 providers overlapped multiple third party data sets, so in these cases all of the relevant third party data sets were used to validate a single service provider/technology type combination. The CBDDP records comments about coverage areas, geometry and attribution provided for the technology type and assigns a categorical assessment of the match between the CBDDP data and the third party data. This assessment is necessarily subjective because the third party data sets are sometimes very crude in their spatial resolution so it is difficult to make precise comparisons.

### 5. Feedback Loop

As a routine part of the work flow, the CBDDP gave all service providers the opportunity to review the final geospatial representation of their data in the form of mapbooks. In addition, the OIT team created and communicated validation assessments based on the tests described below in order to verify speed accuracy for each provider's broadband coverage area. When updates to data were solicited, providers were questioned as to the accuracy of the geospatial display of their coverage areas.

## 6. CAI 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.

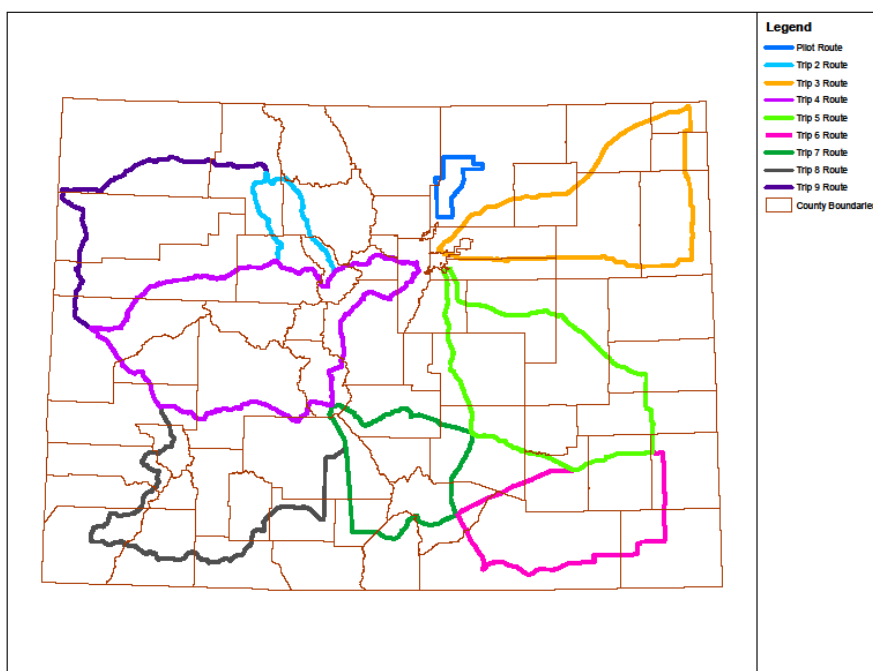
The speed test information that the CBDDP collects from CAIs requests the name of the service provider, but of the 1,662 speed tests collected from CAIs only 1048 of those tests specifically identified the service provider. In the past, the CBDDP used only the tests that included provider information, but for this delivery, we used all of the speed tests. We think this gives a more comprehensive perspective of the comparison between the speeds at each institution and the potential advertised service in their area. 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. A similar test also compared the CAI tests to the minimum advertised speed for all of the providers that reported service in that area, and the table with these results is below as well.

<b>CAI Speed Test Compared to Maximum Download speed by Census Block.</b>																
	<b>Speed Test Slower</b>							<b>Same Tier</b>	<b>Speed Test Faster</b>							<b>Total Tests</b>
<b>Number of Speed Tiers Slower or Faster</b>	<b>-7</b>	<b>-6</b>	<b>-5</b>	<b>-4</b>	<b>-3</b>	<b>-2</b>	<b>-1</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	
<i>School K - 12</i>	2	6	7	54	324	324	164	693	238	42	53	119	38	13	31	2108
<i>Library</i>	1	1	11	20	40	42	31	51	18	6	23	6	0	2	0	252
<i>Healthcare</i>	0	0	15	11	39	89	81	389	53	11	9	6	4	0	0	707
<i>Public Safety</i>	0	7	4	22	187	189	43	1254	29	2	11	25	3	1	2	1779
<i>University, college</i>	0	0	1	0	6	3	4	21	8	6	4	1	0	0	0	54
<i>Other Government</i>	0	4	1	13	8	75	23	312	46	13	5	19	0	2	3	524
<i>Other Non-Government</i>	0	0	0	1	1	3	0	3	0	1	0	0	1	0	0	8
<b>Totals</b>	<b>3</b>	<b>18</b>	<b>39</b>	<b>106</b>	<b>605</b>	<b>725</b>	<b>346</b>	<b>2723</b>	<b>392</b>	<b>80</b>	<b>105</b>	<b>176</b>	<b>45</b>	<b>18</b>	<b>36</b>	<b>5417</b>
<b>Totals</b>	<b>1842</b>							<b>2723</b>	<b>852</b>							<b>5417</b>

CAI Speed Test Compared to Minimum Download speed by Census Block.																
	Speed Test Slower							Same Tier	Speed Test Faster							Total Tests
Number of Speed Tiers Slower or Faster	-7	-6	-5	-4	-3	-2	-1	0	1	2	3	4	5	6	7	
School K - 12	0	0	4	9	59	192	323	367	295	372	204	143	27	60	44	2099
Library	0	0	1	23	18	39	37	47	13	22	20	6	15	10	1	252
Healthcare	0	0	0	6	20	27	102	417	39	40	20	19	13	4	1	708
Public Safety	0	0	0	7	35	178	140	1300	35	18	32	27	4	1	2	1779
University, college	0	0	0	0	1	1	6	13	6	6	7	5	5	3	1	54
Other Government	0	0	0	3	22	87	51	330	45	15	11	27	4	3	3	601
Other Non-Government	0	0	0	0	1	2	2	3	0	1	0	0	1	0	0	10
Totals	0	0	5	48	156	526	661	2477	433	474	294	227	69	81	52	5503
Totals	1396							2477	1630							5503

## 7. Drive Testing Mobile Coverage Areas

The CBDDP tested the mobile wireless coverage areas reported by the service providers. The CBDDP has completed drive testing for over 5,000 miles of roads. This testing followed a test scheme that started with primary test points along major highways followed by secondary points from one half to one mile away from the primary point to confirm the result of the primary point. Up to four additional secondary points farther from the primary points were then tested or until at least two tests fail with test speeds of less than 768 Kbps. The primary points were generally 10 to 15 miles apart, and the derived points were clustered around the primary points within 2 to 3 miles. The tests all used commercially available wireless air cards, identical laptops, and the same FCC speed test site. The tests checked only the major national mobile providers and were all performed between March and May of 2011.



**Figure 1:** The following graphic is a general depiction of the routes used for the drive testing.

The following table presents the results of these drive tests. The number of test results shown for each provider reflects only the test points that fell within the coverage area provided by that service provider to the CBDDP. In addition, some providers had overlapping areas of mobile coverage with differing speed tier information. All of these overlapping areas were included in the comparison for each point that fell in those areas. For example, if at a specific point a provider had four different overlapping regions each with its own speed tier, the test point there was compared to each one, and the results added to the total for the appropriate tier difference and an increased the total number of tests by four for that provider.

MOBILE WIRELESS 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	
	542	657	743	238	92	47	23	13	2355
Totals	2180				92	83			2355
ATT									
	Tiers Slower				Same Tier	Tiers Faster			Total
Number of Speed Tiers Slower or Faster	< 768 Kbps	-3	-2	-1	0	1	2	3	
	366	423	173	57	53	16	9	3	1100
Totals	1019				53	28			1100
Sprint									
	Tiers Slower				Same Tier	Tiers Faster			Total
Number of Speed Tiers Slower or Faster	< 768 Kbps	-3	-2	-1	0	1	2	3	
	84	164	389	98	39	31	14	10	829
Totals	735				39	55			829
Verizon									
	Tiers Slower				Same Tier	Tiers Faster			Total
Number of Speed Tiers Slower or Faster	< 768 Kbps	-3	-2	-1	0	1	2	3	
	92	70	181	83	0	0	0	0	426
Totals	426				0	0			426

## 8. FCC Validation

The FCC speed test information contains two separate data sets, both of which cover a date range from March 2010 to February 2012. The Consumer Broadband Test (CBT) Data includes speed tests from homes, businesses, community centers, and other landline locations. The Mobile Data includes speed test collected using the Mobile App on either an iPhone or Android mobile device.

The following tables compare how the speed tier for the FCC speed tests compare to the maximum and minimum advertised speed tiers reported by service providers for each location.



FCC CBT Data Speed Tests Compared to Maximum Download Speed																			
	Speed Test Slower								Same Tier	Speed Test Faster								Total Tests	
Number of Speed Tiers Slower or Faster																			
	-8	-7	-6	-5	-4	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	
Maximum	4	40	9	59	63	173	200	1586	4635	2554	2678	2165	1889	128	169	39	4	1	16396
Totals	2134								4635	9627								16396	
FCC CBT Data Speed Tests Compared to Minimum Download Speed																			
Minimum	4	44	25	150	823	2059	3991	2201	2393	2201	1697	593	182	30	3	0	0	0	16396
Totals	9297								2393	4706								16396	

FCC Mobile Speed Tests compared to Mobile Services Providers														
	Speed Test Slower					Same Tier	Speed Test Faster							Total Tests
Number of Speed Tiers Slower or Faster	-5	-4	-3	-2	-1	0	1	2	3	4	5	6	7	
Composite														
	10235	19511	32934	71786	90496	83357	83202	63743	41125	32819	128	5	4	529345
Totals	224962					83357	221026							529345
AT&T Mobility LLC														
	0	0	11594	18158	18056	18742	18696	10834	12248	50	2	0	0	108380
Totals	47808					18742	41830							108380
Leap Wireless International, Inc.														
	0	0	0	10552	16496	16578	17734	17844	10206	11894	40	2	0	101346
Totals	27048					16578	57720							101346
Nucla-Naturita Telephone Company														
	0	0	1	0	0	0	1	0	0	0	0	0	0	2
Totals	1					0	1							2
Open Range Communications, Inc.														
	0	0	180	295	328	241	167	146	176	0	0	0	0	1533
Totals	803					241	489							1533
Sprint Nextel Corporation														
	0	3365	4843	7497	10104	10061	6388	6497	2152	2472	11	0	1	53391
Totals	25809					10061	17521							53391
T-Mobile USA, Inc.														
	5439	8518	8725	9179	9280	5437	6163	95	46	1	0	0	0	52883
Totals	41141					5437	6305							52883

Verizon Wireless														
	4775	7615	7574	26094	36226	32295	34053	28327	16297	18402	75	3	3	211739
Totals	82284					32295	97160							211739
Viaero Wireless														
	21	13	17	11	6	3	0	0	0	0	0	0	0	71
Totals	68					3	0							71

## 9. NTIA Assessment Data

NTIA Assessment data shows whether October 2011 data submission values match the comparison data source values. The following is a description of how the data was processed by the NTIA:

*The broadband elements compared were Provider Name, Technology of Transmission (Trans Tech), Max. Advertised Down Speed, Max. Advertised Up Speed, Typical Down Speed, and Typical Up Speed.*

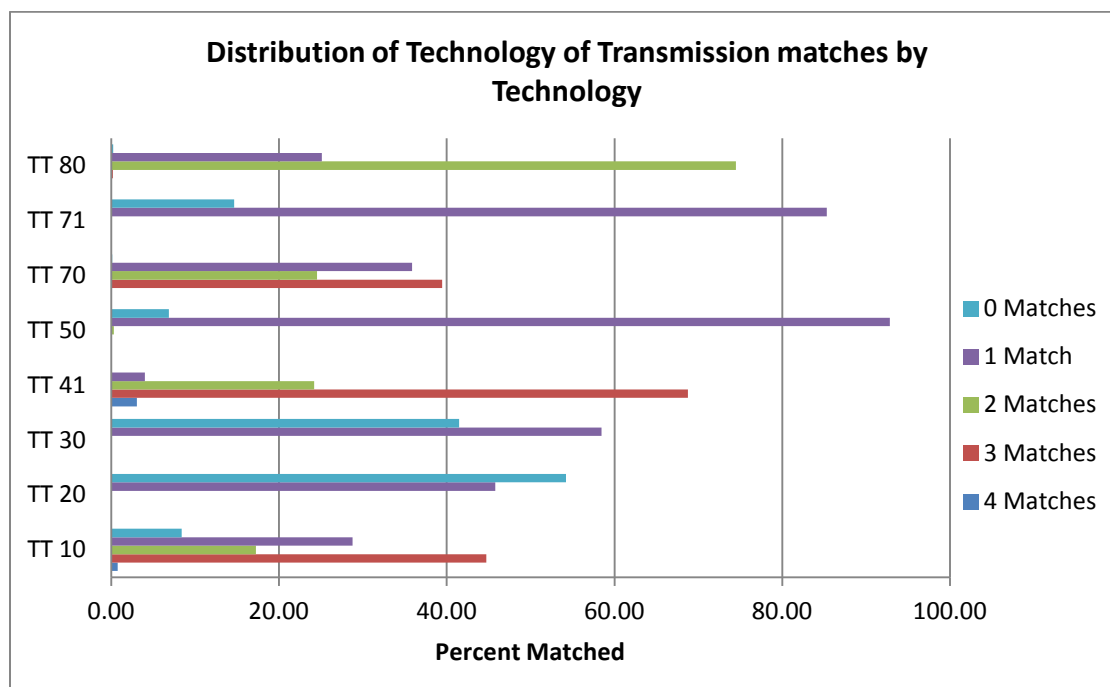
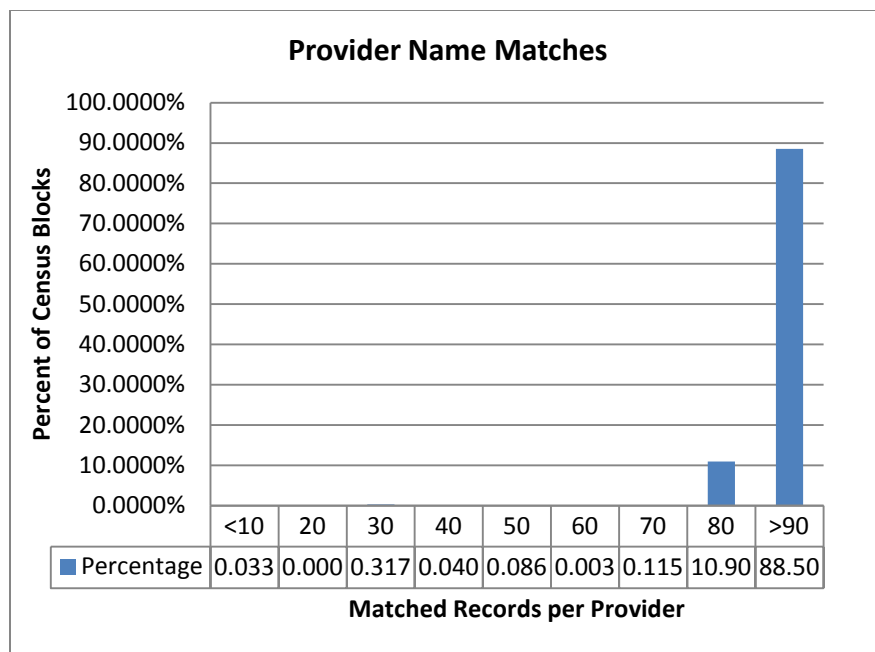
*For each comparison element, the complete record set consists of three types of results:*

1. *Matched Records: the compared elements matched*
2. *No-Match Records: the compared elements did not match*
3. *Not Compared: the broadband elements were not or could not be compared*
  - a. *If Provider Name does not match, no other comparisons are performed*
  - b. *If Technology of Transmission does not match, no speed comparisons are performed*

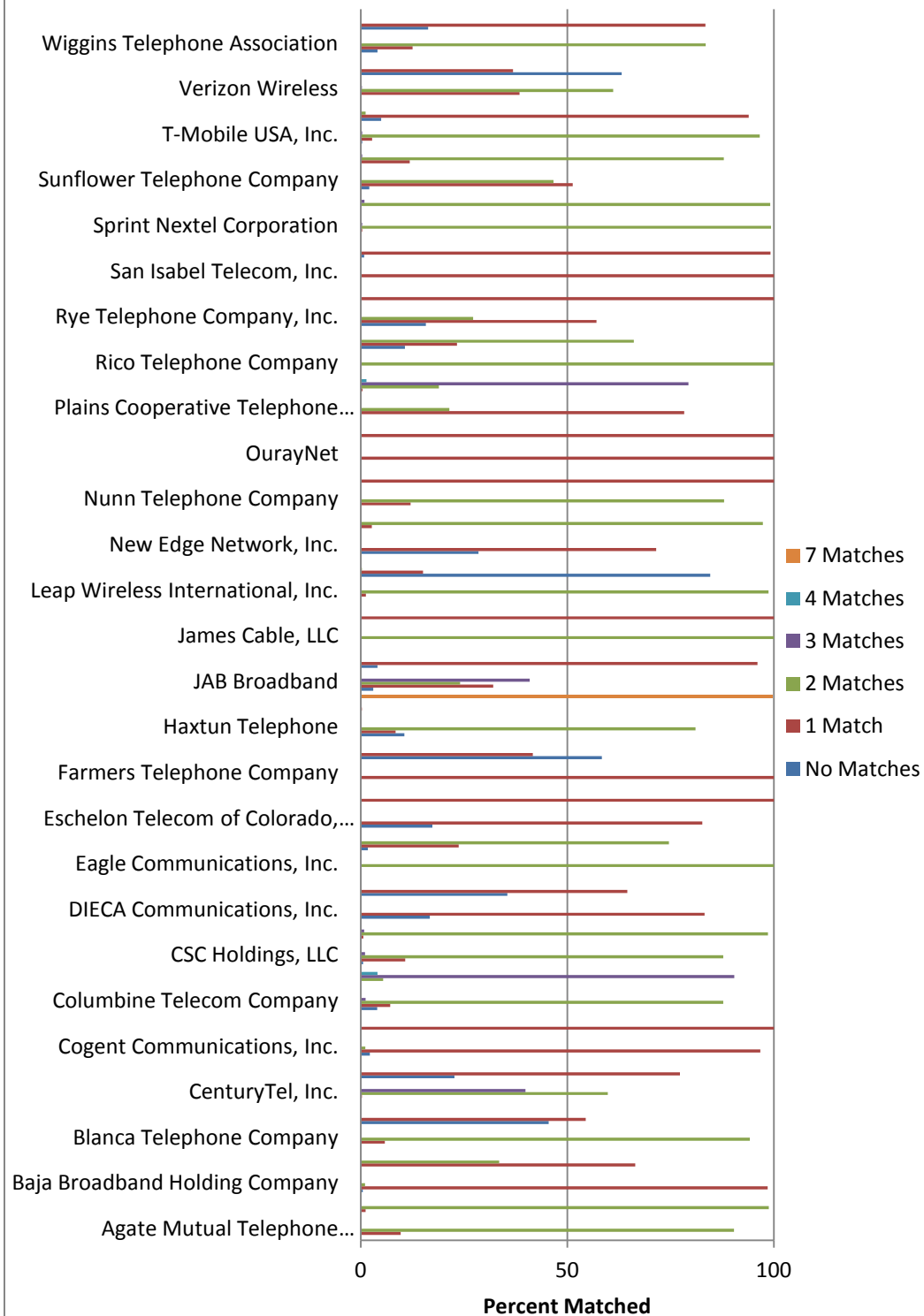
The data was used to validate provider data and the results were communicated to the provider in order to verify data accuracy. The following summary shows the overall results of statewide NTIA Validation data comparison:

### Matched Records by Feature Type:

Feature	Provider Name		Technology of Transmission		Maximum Advertised Download Speed		Maximum Advertised Upload Speed		Typical Download Speed		Typical Upload Speed	
	No.	% Match	No.	% Match	No.	% Match	No.	% Match	No.	% Match	No.	% Match
<b>Address Point</b>	310	66.5%	310	100.0%	240	77.4%	240	77.4%	0	0.0%	0	0.0%
<b>Census Block</b>	356,254	90.7%	288,986	81.1%	100,184	34.7%	111,273	38.5%	11,690	4.0%	11,690	4.0%
<b>Road Segment</b>	98,021	90.3%	91,378	93.2%	33,162	36.3%	23,738	26.0%	9,387	10.3%	4,194	4.6%
<b>Service Area</b>	1,546,579	99.3%	1,541,528	99.7%	466,964	30.3%	468,066	30.4%	1,654	0.1%	1,230	0.1%



## Distribution of Provider Name Matches



## 10. Crowd Sourcing

Colorado broadband speed tests are initiated using an online mapping application in which the general population can conduct speed tests from their home or office. All speeds shown in the application are Maximum Advertised Speeds. The purpose is to collect reports of service from citizens and Community Anchor Institutes. The speed test is provided by an Ookla application and results are given for Download and Upload speeds in mbps. In addition to test results being collected, the User's location, Provider name, technology type, and monthly cost are also requested following the test results. The hyperlink to the Colorado Broadband Mapping Application is provided below:

<http://165.127.200.27/coloradobroadband/>. The CBDDP is still gathering a significant quantity of speed tests to compare to the provider data. After the April delivery, the result of these comparisons will be used in feedback with the providers to help improve the data OIT receives from them.

## 11. Surveys

The CBDDP has prepared a survey for residences and businesses querying them about their broadband availability and their use of broadband as well as their , actual speeds received, and transmission technology. Six Hundred Surveys were collected from rural, underserved, and un-served communities across the state. Similar to the data verification shown above, these results will provide sense of the actual speeds in use or available to residents and businesses across the state. While the address information in these surveys requires some cleansing, the CBDDP will also compare the responses to broadband provider data after this delivery and then represent these results to the broadband service providers as a feedback and potential data improvement process for future data deliveries.

## Summary of Process

The CBDDP follows a data collection process outlined on the National Broadband Map in the "Technical Overview" of the "About" section at [www.broadbandmap.gov](http://www.broadbandmap.gov). If you would like a more detailed, procedural description of the process, please contact the CBDDP via email at [COBroadband@state.co.us](mailto: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 almost twenty cases the 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, the CBDDP reports service along road segments. Before submitting data to the NTIA, the CBDDP integrates the data from each provider into a single dataset using a data model specified by the NTIA. The NTIA and FCC then integrate the CBDDP's dataset along with those from all other states into the single National Broadband Map dataset.

The CBDDP utilized a third party contractor, Critigen, during the first two years of the program. Starting with the April 1, 2012 delivery, the CBDDP has hired staff and brought this process in-house and will continue with in-house staff through the remainder of the program to October 31, 2014. As mentioned earlier, this has resulted in improved data in many cases and inclusion of data from additional providers not included in any previous deliveries. The CBDDP has implemented the following data collection and ingestion processes which may vary from other state programs.

1. The CBDDP implemented the following process to spatially transform broadband service to census or road geography where the service provider has given the CBDDP address specific information. A 150 foot buffer is drawn around each point. Any census block less than 2 square miles touched by the buffered area is selected. For census blocks greater than two square miles, any road segment touched by the buffer is selected.
2. Based on clarifications from the NTIA, the 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. The CBDDP is not currently collecting pricing information.
4. Reference layers include the U.S Census Bureau 2010 census blocks and 2010 TIGER data for roads.
5. Typical speeds continue to be an issue. Only half of the providers include typical speed information in their data.
6. Central office locations and wireless towers are included in the BB\_ConnectionPoint\_MiddleMile.
7. The CBDDP implemented various validation techniques as described in the “Validation and Verification” section of this document.
8. The CBDDP transformed digital subscriber line access multiplexer (DSLAM) locations into a network polyline feature class based on the strength of the device. This strength was used as the basis for a network analysis on the road network to select the census blocks and road segment for that provider service area.

## Data Summary and Feature Class Statistical Tables

File Summary		
File Type		Number of Records
Total Records in all Files		517614
Census Block < 2 sq. miles		394157
Street Segments		116199
Wireless Shape File		57
Service Address		509
BB Service Overview		0
Community Anchor Institutions		5515
Middle Mile		1177
Metadata Provided for Geospatial Data		Yes

Provider Information		
File Type		Number of Records
Number of ISPs Provided		70

## Census Blocks < 2 sq. miles

Data Type	Code	Data Element	Count	%	Data Type	Code	Data Element	Count	%
Records Details		Total Records	392973		Typical Download Speed	3	>= 768 kbps. < 1.5 mbps.	12784	3.3%
		Census Blocks < 2 sq. miles with Broadband	134578			4	>= 1.5 mbps. < 3 mbps.	46716	11.9%
		Census Blocks < 2 sq. miles in State (with & without broadband)	192101			5	>= 3 mbps. < 6 mbps.	100977	25.7%
		Census Blocks > 2 sq. miles in the State (with & without broadband)	8961			6	>= 6 mbps. < 10 mbps.	55553	14.1%
		Total Census Blocks in the State (with & without broadband)	201062			7	>= 10 mbps. < 25 mbps.	32373	8.2%
Services Provider Details		Number of Distinct Providers	36			8	>= 25 mbps. < 50 mbps.	74168	18.9%
		Number of Distinct "Doing Business As"	34			9	> 50 mbps, < 100 mbps.	0	0.0%
		Number of Distinct FRN	35			10	> 100 mbps, < 1 gbps.	0	0.0%
Technology	10	Asymmetric xDSL	192540	49.0%		11	> 1 gbps.	0	0.0%
	20	Symmetric xDSL	58679	14.9%	Max. Advertised Upload Speed	ZZ "null"		70402	17.9%
	30	Other Copper Wireless	77033	19.6%		2	>200 kps, < 768 kps.	19754	5.0%
	40	Cable Modem-DOCSIS 3.0	0	0.0%		3	>= 768 kbps. < 1.5 mbps.	155787	39.6%
	41	Cable Modem-Other	61690	15.7%		4	> 1.5 mbps, < 3 mbps.	66471	16.9%
	50	Optical Carrier/Fiber	3031	0.8%		5	> 3 mbps, < 6 mbps.	85076	21.6%
	60	Satellite	0	0.0%		6	> 6 mbps, < 10 mbps.	39270	10.0%
	70	Terrestrial Fixed Wireless-Unlicensed	0	0.0%		7	> 10 mbps, < 25 mbps.	25485	6.5%
	71	Terrestrial Fixed Wireless-Licensed	0	0.0%		8	> 25 mbps, < 50 mbps.	114	0.0%
	80	Terrestrial Mobile Wireless	0	0.0%		9	> 50 mbps, < 100 mbps.	40	0.0%
	90	Electrical Power Line	0	0.0%		10	> 100 mbps, < 1 gbps.	941	0.2%
	0	Other	0	0.0%		11	> 1 gbps.	35	0.0%
Max. Advertised Download Speed	3	> 768 kps, < 1.5 mbps.	3930	1.0%	Typical Upload Speed	2	>200 kps, < 768 kps.	38546	9.8%
	4	> 1.5 mbps, < 3 mbps.	47436	12.1%		3	> 768 kps, < 1.5 mbps.	71240	18.1%
	5	> 3 mbps, < 6 mbps.	87395	22.2%		4	> 1.5 mbps, < 3 mbps.	74031	18.8%
	6	> 6 mbps, < 10 mbps.	127856	32.5%		5	> 3 mbps, < 6 mbps.	75175	19.1%
	7	> 10 mbps, < 25 mbps.	51112	13.0%		6	> 6 mbps, < 10 mbps.	38206	9.7%
	8	> 25 mbps, < 50 mbps.	74228	18.9%		7	> 10 mbps, < 25 mbps.	25319	6.4%
	9	> 50 mbps, < 100 mbps.	40	0.0%		8	> 25 mbps, < 50 mbps.	54	0.0%
	10	> 100 mbps, < 1 gbps.	941	0.2%		9	> 50 mbps, < 100 mbps.	0	0.0%
	11	> 1 gbps.	35	0.0%		10	> 100 mbps, < 1 gbps.	0	0.0%
						11	> 1 gbps.	0	0.0%
Provider Type	1	Provider	392005	99.8%	End User Name	ZZ "null"		70402	17.9%
	2	Reseller	968	0.2%		1	Residential	390893	99.5%
						2	Governmental	2080	0.5%



## Street Segment

Data Type					Code	Data Element	Count	%
Record Details				Total Records	108607			
Services Provider Details				Number of Distinct Providers	35			
				Number of Distinct "Doing Business As"	33			
				Number of Distinct FRN	34			
Technology		10	Asymmetric xDSL	68760	63.3%			
		20	Symmetric xDSL	15188	14.0%			
		30	Other Copper Wireless	4592	4.2%			
		40	Cable Modem-DOCSIS 3.0	0	0.0%			
		41	Cable Modem-Other	16317	15.0%			
		50	Optical Carrier/Fiber	3750	3.5%			
		60	Satellite	0	0.0%			
		70	Terrestrial Fixed Wireless-Unlicensed	0	0.0%			
		71	Terrestrial Fixed Wireless-Licensed	0	0.0%			
		80	Terrestrial Mobile 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.	6553	6.0%			
		4	> 1.5 mbps, < 3 mbps.	27471	25.3%			
		5	> 3 mbps, < 6 mbps.	8480	7.8%			
		6	> 6 mbps, < 10 mbps.	20847	19.2%			
		7	> 10 mbps, < 25 mbps.	39384	36.3%			
		8	> 25 mbps, < 50 mbps.	5870	5.4%			
		9	> 50 mbps, < 100 mbps.	0	0.0%			
		10	> 100 mbps, < 1 gbps.	2	0.0%			
		11	> 1 gbps.	0	0.0%			
Provider Type		1	Provider	108584	100.0%			
		2	Reseller	23	0.0%			
End User Name		1	Residential	108551	99.9%			
		2	Governmental	56	0.1%			

Data Type		Code	Data Element	Count	%	
Typical Download Speed	3	> 768 kps, < 1.5 mbps.	7730	7.1%		
	4	> 1.5 mbps, < 3 mbps.	26360	24.3%		
	5	> 3 mbps, < 6 mbps.	5653	5.2%		
	6	> 6 mbps, < 10 mbps.	17685	16.3%		
	7	> 10 mbps, < 25 mbps.	13820	12.7%		
	8	> 25 mbps, < 50 mbps.	5870	5.4%		
	9	> 50 mbps, < 100 mbps.	0	0.0%		
	10	> 100 mbps, < 1 gbps.	0	0.0%		
	11	> 1 gbps.	0	0.0%		
			ZZ "null"	31486	29.0%	
	Max. Advertised Upload Speed	2	>200 kps, < 768 kps.	21838	20.1%	
3		> 768 kps, < 1.5 mbps.	45409	41.8%		
4		> 1.5 mbps, < 3 mbps.	19812	18.2%		
5		> 3 mbps, < 6 mbps.	6024	5.5%		
6		> 6 mbps, < 10 mbps.	15326	14.1%		
7		> 10 mbps, < 25 mbps.	196	0.2%		
8		> 25 mbps, < 50 mbps.	0	0.0%		
9		> 50 mbps, < 100 mbps.	0	0.0%		
10		> 100 mbps, < 1 gbps.	2	0.0%		
11		> 1 gbps.	0	0.0%		
Typical Upload Speed		2	>200 kps, < 768 kps.	22185	20.4%	
	3	> 768 kps, < 1.5 mbps.	16702	15.4%		
	4	> 1.5 mbps, < 3 mbps.	19612	18.1%		
	5	> 3 mbps, < 6 mbps.	3235	3.0%		
	6	> 6 mbps, < 10 mbps.	15188	14.0%		
	7	> 10 mbps, < 25 mbps.	196	0.2%		
	8	> 25 mbps, < 50 mbps.	0	0.0%		
	9	> 50 mbps, < 100 mbps.	0	0.0%		
	10	> 100 mbps, < 1 gbps.	0	0.0%		
	11	> 1 gbps.	0	0.0%		
			ZZ "null"	31486	29.0%	

# Wireless

Data Type	Code	Data Element	Count	%	Data Type	Code	Data Element	Count	%
Record Details		Total Records	40		Typical Download Speed	2	>200 kps, < 768 kps.	0	0.0%
Services Provider Details		Number of Distinct Providers	31			3	> 768 kps, < 1.5 mbps.	8	20.0%
		Number of Distinct "Doing Business As"	30			4	> 1.5 mbps, < 3 mbps.	6	15.0%
		Number of Distinct FRN	28			5	> 3 mbps, < 6 mbps.	7	17.5%
Technology	10	Asymmetric xDSL	0	0.0%		6	> 6 mbps, < 10 mbps.	3	7.5%
	20	Symmetric xDSL	0	0.0%		7	> 10 mbps, < 25 mbps.	0	0.0%
	30	Other Copper Wireless	0	0.0%		8	> 25 mbps, < 50 mbps.	0	0.0%
	40	Cable Modem-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%		ZZ	"null"	16	40.0%
	60	Satellite	0	0.0%	Max. Advertised Upload Speed	2	>200 kps, < 768 kps.	6	15.0%
	70	Terrestrial Fixed Wireless-Unlicensed	13	32.5%		3	> 768 kps, < 1.5 mbps.	17	42.5%
	71	Terrestrial Fixed Wireless-Licensed	13	32.5%		4	> 1.5 mbps, < 3 mbps.	9	22.5%
	80	Terrestrial Mobile Wireless	14	35.0%		5	> 3 mbps, < 6 mbps.	6	15.0%
	90	Electrical Power Line	0	0.0%		6	> 6 mbps, < 10 mbps.	2	5.0%
	0	Other	0	0.0%		7	> 10 mbps, < 25 mbps.	0	0.0%
Max. Advertised Download Speed	3	> 768 kps, < 1.5 mbps.	8	20.0%		8	> 25 mbps, < 50 mbps.	0	0.0%
	4	> 1.5 mbps, < 3 mbps.	9	22.5%		9	> 50 mbps, < 100 mbps.	0	0.0%
	5	> 3 mbps, < 6 mbps.	16	40.0%		10	> 100 mbps, < 1 gbps.	0	0.0%
	6	> 6 mbps, < 10 mbps.	7	17.5%		11	> 1 gbps.	0	0.0%
	7	> 10 mbps, < 25 mbps.	0	0.0%	Typical Upload Speed	2	>200 kps, < 768 kps.	3	7.5%
	8	> 25 mbps, < 50 mbps.	0	0.0%		3	> 768 kps, < 1.5 mbps.	16	40.0%
	9	> 50 mbps, < 100 mbps.	0	0.0%		4	> 1.5 mbps, < 3 mbps.	2	5.0%
	10	> 100 mbps, < 1 gbps.	0	0.0%		5	> 3 mbps, < 6 mbps.	2	5.0%
	11	> 1 gbps.	0	0.0%		6	> 6 mbps, < 10 mbps.	1	2.5%
Spectrum	1	800 MHz Spectrum Used	2	5.0%		7	> 10 mbps, < 25 mbps.	0	0.0%
	2	700 MHz Spectrum Used	5	12.5%		8	> 25 mbps, < 50 mbps.	0	0.0%
	3	1900 MHz Spectrum Used	4	10.0%		9	> 50 mbps, < 100 mbps.	0	0.0%
	4	1700 MHz Spectrum Used	5	12.5%		10	> 100 mbps, < 1 gbps.	0	0.0%
	5	2500 MHz Spectrum Used	4	10.0%		ZZ	"null"	16	40.0%
	6	Unlicensed Spectrum Used	18	45.0%					
	7	Specialist Mobile Radio Service	2	5.0%					
	8	Wireless Communication Service	0	0.0%					
	9	Satellite	0	0.0%					

# Community Anchor Institutes

Data Type		Code	Data Element	Count	%	Data Type	Code	Data Element	Count	%
Record Details			Total Records	5515		Max. Advertised Upload Speed	1	< 200 kps.	0	0.0%
					2		>200 kps, < 768 kps.	125	2.3%	
Anchor Category	1	School-K through 12	2109	38.2%	3		> 768 kps, < 1.5 mbps.	195	3.5%	
	2	Library	252	4.6%	4		> 1.5 mbps, < 3 mbps.	1297	23.5%	
	3	Medical/healthcare	709	12.9%	5		> 3 mbps, < 6 mbps.	516	9.4%	
	4	Public safety	1779	32.3%	6		> 6 mbps, < 10 mbps.	391	7.1%	
	5	University, college, other post-secondary	55	1.0%	7		> 10 mbps, < 25 mbps.	660	12.0%	
	6	Other community support-/gov't	601	10.9%	8		> 25 mbps, < 50 mbps.	90	1.6%	
	7	Other community support-non-/gov't	10	0.2%	9		> 50 mbps, < 100 mbps.	8	0.1%	
					10		> 100 mbps, < 1 gbps.	54	1.0%	
Technology	10	Asymmetric xDSL	340	6.2%	11		> 1 gbps.	70	1.3%	
	20	Symmetric xDSL	6	0.1%			ZZ "null"	2109	38.2%	
	30	Other Copper Wireless	1591	28.8%						
	40	Cable Modem-DOCSIS 3.0	0	0.0%	Y/N Broadband Service	Y	Yes-Subscribers to Service	3406	61.8%	
	41	Cable Modem-Other	133	2.4%		N	No-Does Not Subscribers to Service	2109	38.2%	
	50	Optical Carrier/Fiber	1248	22.6%						
	60	Satellite	14	0.3%	Lat/Long Accuracy	1	Lat/Long that Falls within the State	5515		
	70	Terrestrial Fixed Wireless-Unlicensed	27	0.5%		2	Total Lat/Long	5515	100%	
	71	Terrestrial Fixed Wireless-Licensed	77	1.4%						
	80	Terrestrial Mobile Wireless	0	0.0%	Anchor Names	Total Count Anchors Names		5515		
	90	Electrical Power Line	0	0.0%		Distinct Count of Anchor Names		5368		
	0	Other	0	0.0%						
Max. Advertised Download Speed	3	> 768 kps, < 1.5 mbps.	209	3.8%	Community Anchor Institution Category Count with Broadband Information	1	School-K through 12	2109	1950	
	4	> 1.5 mbps, < 3 mbps.	1292	23.4%		2	Library	252	209	
	5	> 3 mbps, < 6 mbps.	421	7.6%		3	Medical/healthcare	709	327	
	6	> 6 mbps, < 10 mbps.	280	5.1%		4	Public safety	1779	566	
	7	> 10 mbps, < 25 mbps.	913	16.6%		5	University, college, other post-secondary	55	43	
	8	> 25 mbps, < 50 mbps.	157	2.8%		6	Other community support-/gov't	601	305	
	9	> 50 mbps, < 100 mbps.	10	0.2%		7	Other community support-non-/gov't	10	6	
	10	> 100 mbps, < 1 gbps.	54	1.0%		Totals		5515	3406	
	11	> 1 gbps.	70	1.3%						
		ZZ "null"	2109	38.2%		Public WI IF	1	Y	0	
							2	N	5515	

## Middle Mile

Data Type	Code	Data Element	Count	%	Data Type	Code	Data Element	Count	%
Record Details		Total Records	926		Facility Type	1	Fiber	480	51.8%
						2	Copper	5	0.5%
Services Provider Details		Number of Distinct Providers	37			3	Hybrid Fiber Coax (HFC)	1	0.1%
		Number of Distinct "Doing Business As"	33			4	Wireless	440	47.5%
		Number of Distinct FRN	36				N/A "null"	0	0.0%
Ownership	0	Owned	112	12.1%	Lat / Long		# of Lat/Long in State	926	100%
	1	Leased	814	87.9%			Total Lat/Long	926	
Facility Capacity	1	Multiple T1's and less than 40 mbps.	409	44.2%	Elevation		Number of Data Points	425	
	2	Greater than 40 mbps. and less than 150 mbps.	87	9.4%			Lowest Elevation	5	
	3	Greater than 150 mbps. and less than 600 mbps.	43	4.6%			Highest Elevation	225	
	4	Greater than 600 mbps. and less than 2.4 gbps.	15	1.6%					
	5	Greater than 2.4 gbps. and less than 10 gbps.	2	0.2%					
	6	Greater than 10 gbps	370	40.0%					

Services Providers				Census	Roads	Wireless	Mid Mile
#	Broadband Services Providers Submitted						
	FRN	Company Name	Doing Business As				
1	0004311627	Agate Mutual Telephone Cooperative Association	Prairie Networks, LLC	28	214		10
2	0003777927	Antilles Wireless, LLC	USA Communications	232		1	
3	0004496774	AT&T Inc.	AT&T Corp, Inc.			2	1
4	0014860522	Baja Broadband Holding Company	Baja Broadband Operating Company, LLC	995	138		
5	0003728292	Beulahland Communications, Inc.,	Beulahland Communications, Inc.,			2	1
6	0003754652	Bijou Telephone Co-op Association, Inc.	Bijou Telephone Cooperative Association, Inc.	424	902	1	3
7	0003766201	Blanca Telephone Company	Blanca Telephone Company	2922	3252		
8	0017108747	Brainstorm Internet	Brainstorm Internet			1	14
9	0014778781	BySky, Inc.	BySky, Inc.			1	
10	0019746445	CAP Cable	USA Communications	628	5	1	
11	0018626853	CenturyTel, Inc.	CenturyTel, Inc.	92302	47370		2
12	0001621127	City of Glenwood Springs	City of Glenwood Springs, Community Broadband Network	835	52	1	
13	9999	Colorado Mobile Inet, LLC	Colorado Mobile Inet, LLC			1	
14	0002147098	Columbine Telecom Company	FairPoint Communications	251	667	1	10
15	0004441663	Comcast Cable Communications, LLC	Comcast	48819	9520		
16	0007001977	CSC Holdings, LLC	Bresnan Communications	13361	5746		
17	0001617281	Delta County Tele-comm, Inc.	TDS Telecom	825	820		1
18	0003753753	DIECA Communications, Inc.	Covad Communications Company	133643	4572		3
19	0001629781	Dubois Telephone Exchange, Inc.,	DTE	53	130	1	4
20	0013339973	Eagle Communications, Inc.	Eagle Cable TV And Internet	237	29		1
21	0004317731	Eastern Slope Rural Telephone Association, Inc.	Eastern Slope Rural Telephone Association, Inc.	1998	6511		12
22	0003767852	Eschelon Telecom of Colorado, Inc.	Integra Telecom	81750	20735		
23	0004338489	Farmers Telephone Company	Farmers Telephone Company	180	921		12
24	0005059092	Farmers Telecommunications	Farmers Telecommunications	682	111	2	1
25	0015575285	Front Range Internet, Inc.	Front Range Internet, Inc.	795	2		1
26	0016084683	Grand County Internet Services, Inc.	Grand County Internet Services, Inc.			1	30
27	0000824224	Grand Valley Telecommunications, Inc.	Grand Valley Telecommunications, Inc.	1171	10	1	7
28	0001616200	Haxtun Telephone	Haxtun	1023	1327		
29	0019794643	HighSpeed4U	HighSpeed4U			1	24
30	0002157550	IHateToWait.com, LLC	IHateToWait			1	2
31	0015866460	Internet Colorado	Internet Colorado	364	54	1	10
32	0018706002	Inventive Wireless of Nebraska, LLC	Vistabeam			1	
33	9999	Irish & Reynolds, Inc.	Nednet			3	
34	0014175673	JAB Broadband	Skybeam, Inc.			1	416
35	0003766623	Jade Communications, LLC	Jade Communications, LLC			1	7

36	0002748044	James Cable LLC	CommuniComm Services	692	3		1
37	0003728284	J.e.d. Enterprises, Inc.	J.e.d. Enterprises, Inc.	209	1780		16
38	0005030200	Live Wire Networks, Inc.	Live Wire Networks, Inc.	293		1	
39	0003723822	Level 3 Communications, LLC	Level 3 Communications, LLC				365
40	0002963528	Leap Wireless International, Inc.	Cricket Communications, Inc.,			2	
41	0018769547	Magnolia Road Internet Coop	MRIC			2	20
42	9999	Nedernet, Inc.	Nedernet, Inc.			1	12
43	0003720471	New Edge Holding Company	New Edge Networks, Inc.	968	23		
44	0004312187	Nucla-Naturita Telephone Company	Nucla-Naturita Telephone Company	229	201	2	
45	0004311809	Nunn Telephone Company	Nunn Communication, LLC	199	679		1
46	0015246895	Open Range Communications Inc.	Open Range Communications Inc.			1	39
47	9999	OurayNet	OurayNet			1	13
48	0014699953	Peetz Communications, LLC	Peetz Cooperative Telephone Company	94	176	1	
49	0004314316	Phillips County Telephone Company	PCTelecom	1888	236	1	4
50	0001615889	Plains Cooperative Telephone Association, Inc.,	Plains Cooperative Telephone Association, Inc.,	1113	3475	1	52
51	0005059092	Rico Telephone Company	Rico Telephone Company	78	93		3
52	0014705602	Roggen Telephone Cooperative Company	Roggen Telephone Enterprises, Inc.			1	1
53	0001615665	Rye Telephone Company, Inc.	ghValley.net	894	2641	2	2
54	0005061775	San Isabel Telecom, Inc.	San Isabel Telecom, Inc.			1	5
55	0004310769	S&T Telephone Coop Association Inc.	S&T Telephone Coop Assoc Inc	22	29		
56	0016136327	SECOM	SECOM			1	25
57	0005070933	South Park Telephone Company, LLC	ghValley.net			2	1
58	0003774593	Sprint Nextel Corporation	Sprint			2	1
59	0001616390	Strasburg Telephone Company	TDS Telecom	112	180		1
60	0003723236	Sunflower Telephone Company	FairPoint Communications	179	359		12
61	0006945950	T-Mobile USA, Inc.	T-Mobile			3	9
62	0013430244	Time Warner Cable	Time Warner Cable	922	485		
63	0004351086	tw telecom inc.	tw telecom inc.	1260	5		2
64	0003290673	Verizon Wireless	Verizon Wireless			4	
65	0015360456	Viaero Wireless	Viaero Wireless			1	
66	0001616192	Wiggins Telephone Association	Wiggins Telephone	648	2693		1
67	0006275945	XO Communications, LLC	XO Communications Services, Inc. (Affiliated Entity)	839	53		
68	0012579652	Zirkel Wireless, LLC	Zirkel Wireless, LLC			1	19
69	0019898303	Cogent Communications, Inc.	Cogent Communications, Inc.	43 Service Address			
	0003723822	Level 3 Communications, LLC	Level 3 Communications, LLC	466 Service Address			

## Distinct Speed Tiers Provided

Allowable				
Technology Codes		Down	Up	Speed Tier Codes
10	Asymmetric xDSL	3 to 8	2 to 7	1 < 200 kps.
20	Symmetric xDSL	3 to 8	3 to 8	2 >200 kps, < 768 kps.
30	Other Copper Wireless	3 to 8	2 to 8	3 > 768 kps, < 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	Terrestrial Fixed Wireless-Unlicensed	3 to 6	2 to 6	8 > 25 mbps, < 50 mbps.
71	Terrestrial Fixed Wireless-Licensed	3 to 6	2 to 6	9 > 50 mbps, < 100 mbps.
80	Terrestrial Mobile Wireless	3 to 6	2 to 6	10 > 100 mbps, < 1 gbps.
90	Electric Power Lines	3 to 6	2 to 6	11 > 1 gbps.
0	All Other	3 to 11	2 to 11	

## Distinct Speed Tiers Provided

Maximum Advertised Speed				Typical Speed			
Technology	Download	Upload	Freq.	Technology	Download	Upload	Freq.
10	3	2	4912	10	3	2	13233
10	3	3	6938	10	3	3	6938
10	4	2	28182	10	4	2	8140
10	4	3	21149	10	4	3	700
10	5	2	14351	10	5	2	18503
10	5	3	8535	10	5	3	3257
10	5	4	552	10	6	3	1502
10	5	5	15	10	7	4	46239
10	6	2	3703	10	ZZ	ZZ	158410
10	6	3	67664	20	3	2	4123
10	6	4	24854	20	3	3	601
10	6	5	4320	20	4	4	16185
10	7	4	46239	20	5	5	638
10	7	5	9152	20	6	6	54633
10	7	6	46	20	7	7	1634
10	7	7	16288	20	8	8	974
10	8	7	20	20	ZZ	ZZ	31
20	3	2	7	30	3	3	3
20	3	3	4423	30	4	2	37
20	4	3	2	30	4	4	2653
20	4	4	8249	30	5	5	76233
20	5	4	6	30	6	6	36
20	5	5	8891	30	7	7	451
20	6	6	54056	30	7	8	1099

Maximum Advertised Speed				Typical Speed			
Technology	Download	Upload	Freq.	Technology	Download	Upload	Freq.
30	3	3	378	30	8	8	54
30	4	4	3079	30	ZZ	ZZ	1208
30	5	5	76405	40	ZZ	ZZ	58339
30	6	4	37	41	5	2	93
30	7	8	1099	41	5	4	695
30	6	6	114	41	7	2	772
30	7	7	557	41	7	4	266
30	7	8	1099	41	ZZ	ZZ	21647
30	8	8	105	50	5	2	77
40	5	5	338	50	6	4	1062
40	6	6	58001	50	7	4	2731
41	5	2	93	50	7	7	793
41	5	4	695	50	11	11	466
41	7	2	772	50	ZZ	ZZ	6419
41	6	6	1133	70	4	3	3
41	7	3	19107	70	5	2	3
41	7	4	1673	70	5	3	3
50	3	3	10	70	5	4	1
50	4	4	11	70	5	5	1
50	5	5	18	70	6	6	1
50	6	6	13	70	ZZ	ZZ	7
50	7	4	2731	71	3	3	5
50	7	5	6256	71	4	3	1
50	7	7	883	71	5	3	3
50	8	8	25	71	ZZ	ZZ	5
50	9	9	49	80	3	2	4
50	10	10	1017	80	4	3	1
50	11	10	35	80	5	3	1
50	11	11	500	80	6	5	1
70	3	2	1	80	ZZ	ZZ	9
70	3	3	2				
70	4	3	2				
70	5	2	3				
70	5	3	4				
70	5	4	2				
70	5	5	2				
70	6	2	2				
70	6	4	1				
70	6	5	2				
70	6	6	3				
71	3	2	1				



Maximum Advertised Speed			
Technology	Download	Upload	Freq.
71	3	3	4
70	4	2	1
71	4	3	1
71	4	4	2
71	5	2	1
71	5	3	3
71	5	4	1
71	5	5	1
71	6	5	1
71	6	6	1
80	3	2	6
80	4	2	1
80	4	3	3
80	5	3	1
80	5	4	1
80	6	2	1
80	6	4	1
80	6	5	2