Colorado Broadband Data & Development Program
October 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. 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 October 1, 2011 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 has continued the data collection effort begun with a third party contractor through a data collection contract signed on March 22, 2010. The contractor has collected data 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 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
Identified	102	158	161	161
Duplicates	0	14	14	14
Not a BB Provider	15	24	29	31
Working Universe of SP's	87	120	118	116
Multiple Contact Efforts, Have Chosen Not to Participate So Far, May Not Be a Provider	5	17	50	46
Data Sets Delivered to NTIA	39	59	65*	71**
Broadband Provider Status Not Yet Known	43	44	0	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
** Data Received but Not Included in Data Set: 2 Providers 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. Three dataset were also removed the previous delivery: 1) Alltel Wireless-was acquired by AT & T, 2) Big Sandy Telecom, Inc. speeds did not meet broadband requirements and 3) Town of Timnath stopped providing broadband service.

Service Provider Updates	October 1, 2011
New in Data Set	1
Updated Data	26
Responded "No Data Change"	43
Data Sets Delivered to NTIA	63

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, 44%, or 1,662 of 3,768, 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	October 1, 2011		
	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
	5515	**3613**	**1663**

Validation and Verification Processes for the April 2011 Data Set

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**. This data delivery uses the 2010 census block geography which is different from the 2000 geography used for the April 1, 2011 data delivery. As a result it is impossible to perform a straight comparison and enumerate changes in census features for each provider between the April 2011 and October 2011 deliveries. However, to obtain a rough assessment of the providers that may have submitted significant changes to their data, the CBDDP first calculated the increase in the number of census blocks from 2000 to 2010 (29.5%). There was also a decrease in the number of blocks greater than two square miles that had provider provider data in them (-32.7%). If a provider's census block coverage increased by more than 31%, it become a higher priority provider to scrutinize. In these cases, CBDDP staff looked closely at the data, visually inspecting all of the blocks in the provider's data set to

determine if there were any apparently erroneous changes. No significant corrections to the resulting data were necessary as a result of this process.

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 the October 1, 2011 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. In 21 instances, multiple 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**. The CBDDP provides all service providers the opportunity to review the final geospatial representation of their data as a routine part of the work flow. In addition, when updates to data were solicited, providers were questioned as to the accuracy of the geospatial display of their coverage areas.

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 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 among all of the providers that reported service in that area, and the table with those results are below as well.

CAI Speed Test Compared to Maximum 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	2	1	23	51	117	118	277	249	78	35	17	6				974
Library		3	1			3	3	3		1						14
Healthcare		7	7	21	25	19	28	22	9	4						142
Public Safety		1	8	31	64	61	44	79	12	5						305
University, college		1		1	5	1	5	13	6	3	4	3				42
Other Government		1	4	18	25	24	25	47	28	3	4					179
Other Non-Government				1	1	3		1								6
Totals	2	14	43	123	237	229	382	414	133	51	25	9				1662
Totals	1030							414	218							1662

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			2	14	44	76	104	209	149	185	156	22	9	4		974
Library				1	2	4	2	4				1				14
Healthcare			3	6	18	20	36	24	15	10	5	3	1	1		142
Public Safety			3	10	28	42	47	94	35	22	14	10				305
University, college						1	4	4	4	5	11	4	6	2	1	42
Other Government			1	11	17	19	29	42	32	8	13	7				179
Other Non-Government				1	1	1	2	1								6
Totals			9	43	110	163	224	378	235	230	199	47	16	7	1	1662
Totals	549							378	735							1662

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.

The following graphic is a general depiction of the routes used for the drive testing.
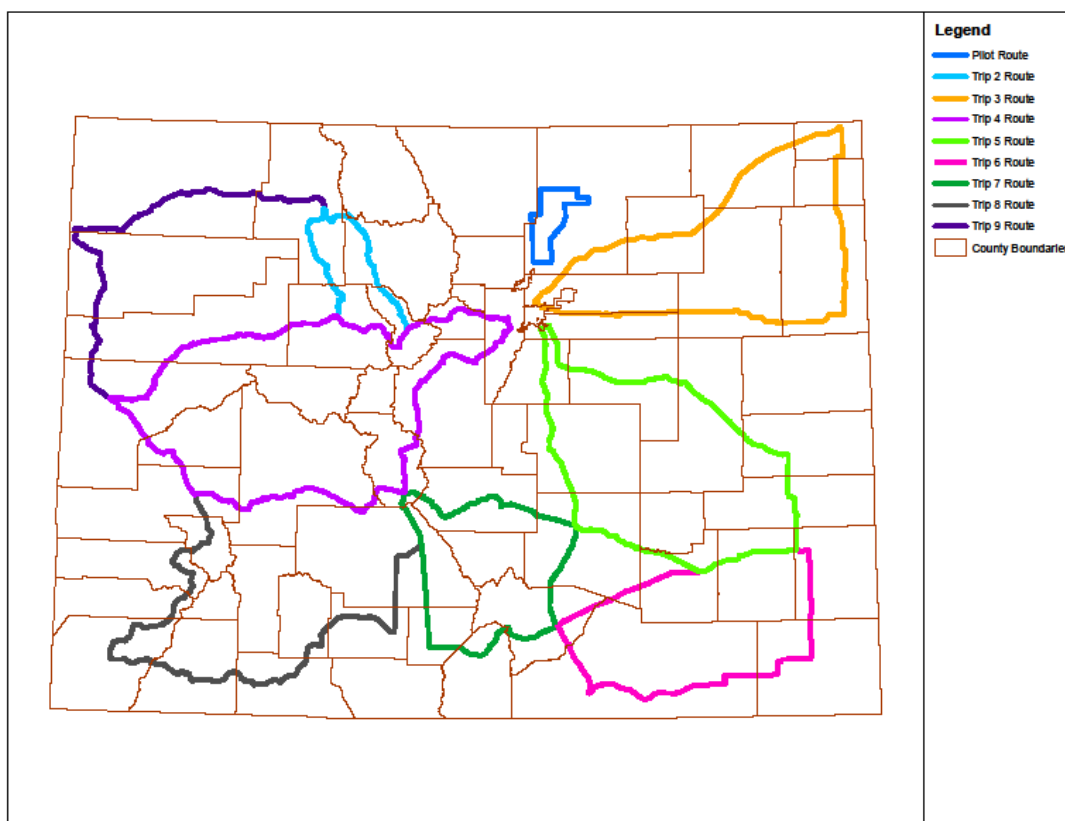
The following table presents the results of drive testing completed. The number of test results shown for each provider reflect only the test points that fell within the coverage area provided by that service provider to the CBDDP. In addition, some providers had overlapping areas of mobile coverage 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 a increased the total number of tests by four for that provider.

MOBILE WIRLESS COVERAGE TESTING									
All Points Tested Including Primary and Secondary									
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**

Planned Data Verification and Analysis

The CBDDP has prepared a survey for residences and businesses querying them about their broadband availability and their use of broadband. The survey process has collected over 150 responses in the southwest portion of the state, which met the sample requirements for that region as defined by the CBDDP Quality Assurance specialist. The survey is also under way in the northeast, southeast and central southern areas of Colorado as well.

The CBDDP is currently analyzing the data from the southwestern region survey responses. 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. The CBDDP expects to represent these results to the broadband service providers as a feedback and potential data improvement process for future data deliveries.

Summary of Process

The CBBDP 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 the 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 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.

An earlier section in this report titled "Data Verification and Analysis", describes the specific steps that the 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. 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 touched by the buffered area is selected. For census blocks greater than two square miles, any road segment touched by the buffer is selected. The 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, 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. The 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, previous to the October 2010 deliver, 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, the CBDDP is using Qwest advertised as typical speed.

5. The CBDDP has created an exception table that will record unusual areas or pockets were 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. The 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 CenturyLink did not provide such information, and have requested the CBDDP not include publicly available central office locations in the data set.

7. The CBDDP is utilizing a data collection contractor during the first two years of the program. Starting in October 2011 (i.e., for the April 1, 2012 delivery), and through the remainder of the program to October 31, 2014, the CBDDP will bring this process in-house. The CBDDP has worked closely with the contractor, and has developed skills and experience in validating the information and working with the data sets. Consequently, this transition should be seamless.

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. 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.

Data Summary and Feature Class Statistical Tables

Data Summary		
File Summary		
File Type		Number of Records
Total Records in all Files		**508522**
Census Block < 2 sq. miles		**392973**
Street Segments		**108607**
Wireless Shape File		**40**
Service Address		**466**
BB Service Overview		**0**
Community Anchor Instituions		**5515**
Middle Mile		**921**
Metadata Provided for Geospatial Data		**Yes**
Provider Information		
File Type		Number of Records
Number of ISPs Provided		**63**

Data Delivery Report

<table>
<tr><th colspan="10" style="text-align:center">Census Blocks ‹ 2 sq. miles</th></tr>
<tr>
<th>Data Type</th><th>Code</th><th>Data Element</th><th>Count</th><th>%</th>
<th>Data Type</th><th>Code</th><th>Data Element</th><th>Count</th><th>%</th>
</tr>
<tr>
<td rowspan="5">Records Details</td><td></td><td>Total Records</td><td>392973</td><td></td>
<td rowspan="9">Typical Download Speed</td><td>3</td><td>>= 768 kbps. < 1.5 mbps.</td><td>12784</td><td>3.3%</td>
</tr>
<tr>
<td></td><td>Census Blocks < 2 sq. miles with Broadband</td><td>134578</td><td></td>
<td>4</td><td>>= 1.5 mbps. < 3 mbps.</td><td>46716</td><td>11.9%</td>
</tr>
<tr>
<td></td><td>Census Blocks < 2 sq. miles in State (with & without broadband)</td><td>192101</td><td></td>
<td>5</td><td>>= 3 mbps. < 6 mbps.</td><td>100977</td><td>25.7%</td>
</tr>
<tr>
<td></td><td>Census Blocks > 2 sq. miles in the State (with & without broadband)</td><td>8961</td><td></td>
<td>6</td><td>>= 6 mbps. < 10 mbps.</td><td>55553</td><td>14.1%</td>
</tr>
<tr>
<td></td><td>Total Census Blocks in the State (with & without broadband)</td><td>201062</td><td></td>
<td>7</td><td>>= 10 mbps. < 25 mbps.</td><td>32373</td><td>8.2%</td>
</tr>
<tr>
<td rowspan="3">Services Provider Details</td><td></td><td>Number of Distinct Providers</td><td>36</td><td></td>
<td>8</td><td>>= 25 mbps. < 50 mbps.</td><td>74168</td><td>18.9%</td>
</tr>
<tr>
<td></td><td>Number of Distinct "Doing Business As"</td><td>34</td><td></td>
<td>9</td><td>> 50 mbps. < 100 mbps.</td><td>0</td><td>0.0%</td>
</tr>
<tr>
<td></td><td>Number of Distinct FRN</td><td>35</td><td></td>
<td>10</td><td>> 100 mbps, < 1 gbps.</td><td>0</td><td>0.0%</td>
</tr>
<tr>
<td></td><td></td><td></td><td></td>
<td>11</td><td>> 1 gbps.</td><td>0</td><td>0.0%</td>
</tr>
<tr>
<td rowspan="13">Technology</td><td></td><td></td><td></td><td></td>
<td></td><td>ZZ "null"</td><td>70402</td><td>17.9%</td>
</tr>
<tr>
<td>10</td><td>Asymmetric xDSL</td><td>192540</td><td>49.0%</td>
<td rowspan="10">Max. Advertised Upload Speed</td><td>2</td><td>>200 kps, < 768 kps.</td><td>19754</td><td>5.0%</td>
</tr>
<tr>
<td>20</td><td>Symmetric xDSL</td><td>58679</td><td>14.9%</td>
<td>3</td><td>>= 768 kbps. < 1.5 mbps.</td><td>155787</td><td>39.6%</td>
</tr>
<tr>
<td>30</td><td>Other Copper Wireless</td><td>77033</td><td>19.6%</td>
<td>4</td><td>> 1.5 mbps, < 3 mbps.</td><td>66471</td><td>16.9%</td>
</tr>
<tr>
<td>40</td><td>Cable Modem-DOCSIS 3.0</td><td>0</td><td>0.0%</td>
<td>5</td><td>> 3 mbps, < 6 mbps.</td><td>85076</td><td>21.6%</td>
</tr>
<tr>
<td>41</td><td>Cable Modem-Other</td><td>61690</td><td>15.7%</td>
<td>6</td><td>> 6 mbps, < 10 mbps.</td><td>39270</td><td>10.0%</td>
</tr>
<tr>
<td>50</td><td>Optical Carrier/Fiber</td><td>3031</td><td>0.8%</td>
<td>7</td><td>> 10 mbps, < 25 mbps.</td><td>25485</td><td>6.5%</td>
</tr>
<tr>
<td>60</td><td>Satellite</td><td>0</td><td>0.0%</td>
<td>8</td><td>> 25 mbps, < 50 mbps.</td><td>114</td><td>0.0%</td>
</tr>
<tr>
<td>70</td><td>Terrestrial Fixed Wireless-Unlicensed</td><td>0</td><td>0.0%</td>
<td>9</td><td>> 50 mbps, < 100 mbps.</td><td>40</td><td>0.0%</td>
</tr>
<tr>
<td>71</td><td>Terrestrial Fixed Wireless-Licensed</td><td>0</td><td>0.0%</td>
<td>10</td><td>> 100 mbps, < 1 gbps.</td><td>941</td><td>0.2%</td>
</tr>
<tr>
<td>80</td><td>Terrestrial Mobile Wireless</td><td>0</td><td>0.0%</td>
<td>11</td><td>> 1 gbps.</td><td>35</td><td>0.0%</td>
</tr>
<tr>
<td>90</td><td>Electrial Power Line</td><td>0</td><td>0.0%</td>
<td rowspan="8">Typical Upload Speed</td><td>2</td><td>>200 kps, < 768 kps.</td><td>38546</td><td>9.8%</td>
</tr>
<tr>
<td>0</td><td>Other</td><td>0</td><td>0.0%</td>
<td>3</td><td>> 768 kps, < 1.5 mbps.</td><td>71240</td><td>18.1%</td>
</tr>
<tr>
<td rowspan="7">Max. Advertised Download Speed</td><td>3</td><td>> 768 kps, < 1.5 mbps.</td><td>3930</td><td>1.0%</td>
<td>4</td><td>> 1.5 mbps, < 3 mbps.</td><td>74031</td><td>18.8%</td>
</tr>
<tr>
<td>4</td><td>> 1.5 mbps, < 3 mbps.</td><td>47436</td><td>12.1%</td>
<td>5</td><td>> 3 mbps, < 6 mbps.</td><td>75175</td><td>19.1%</td>
</tr>
<tr>
<td>5</td><td>> 3 mbps, < 6 mbps.</td><td>87395</td><td>22.2%</td>
<td>6</td><td>> 6 mbps, < 10 mbps.</td><td>38206</td><td>9.7%</td>
</tr>
<tr>
<td>6</td><td>> 6 mbps, < 10 mbps.</td><td>127856</td><td>32.5%</td>
<td>7</td><td>> 10 mbps, < 25 mbps.</td><td>25319</td><td>6.4%</td>
</tr>
<tr>
<td>7</td><td>> 10 mbps, < 25 mbps.</td><td>51112</td><td>13.0%</td>
<td>8</td><td>> 25 mbps, < 50 mbps.</td><td>54</td><td>0.0%</td>
</tr>
<tr>
<td>8</td><td>> 25 mbps, < 50 mbps.</td><td>74228</td><td>18.9%</td>
<td>9</td><td>> 50 mbps, < 100 mbps.</td><td>0</td><td>0.0%</td>
</tr>
<tr>
<td>9</td><td>> 50 mbps, < 100 mbps.</td><td>40</td><td>0.0%</td>
<td></td><td></td><td></td><td></td>
</tr>
</table>

Data Type	Code	Data Element	Count	%
	10	> 100 mbps, < 1 gbps.	941	0.2%
	11	> 1 gbps.	35	0.0%
Provider Type	1	Provider	392005	99.8%
	2	Reseller	968	0.2%
End User Name	1	Residential	390893	99.5%
	2	Governmental	2080	0.5%

Code	Data Element	Count	%
10	> 100 mbps, < 1 gbps.	0	0.0%
11	> 1 gbps.	0	0.0%
	ZZ "null"	70402	17.9%

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	Electrial 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%

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%

Data Type	Code	Data Element	Count	%		Data Type	Code	Data Element	Count	%
	9	> 50 mbps, < 100 mbps.	0	0.0%			5	> 3 mbps, < 6 mbps.	3235	3.0%
	10	> 100 mbps, < 1 gbps.	2	0.0%			6	> 6 mbps, < 10 mbps.	15188	14.0%
	11	> 1 gbps.	0	0.0%			7	> 10 mbps, < 25 mbps.	196	0.2%
							8	> 25 mbps, < 50 mbps.	0	0.0%
Provider Type	1	Provider	108584	100.0%			9	> 50 mbps, < 100 mbps.	0	0.0%
	2	Reseller	23	0.0%			10	> 100 mbps, < 1 gbps.	0	0.0%
							11	> 1 gbps.	0	0.0%
End User Name	1	Residential	108551	99.9%				ZZ "null"	31486	29.0%
	2	Governmental	56	0.1%						

Wireless

Data Type	Code	Data Element	Count	%		Data Type	Code	Data Element	Count	%
Record Details		Total Records	40				2	>200 kps, < 768 kps.	0	0.0%
							3	> 768 kps, < 1.5 mbps.	8	20.0%
Services Provider Details		Number of Distinct Providers	31			Typical Download Speed	4	> 1.5 mbps, < 3 mbps.	6	15.0%
		Number of Distinct "Doing Business As"	30				5	> 3 mbps, < 6 mbps.	7	17.5%
		Number of Distinct FRN	28				6	> 6 mbps, < 10 mbps.	3	7.5%
							7	> 10 mbps, < 25 mbps.	0	0.0%
Technology	10	Asymmetric xDSL	0	0.0%			8	> 25 mbps, < 50 mbps.	0	0.0%
	20	Symmetric xDSL	0	0.0%			9	> 50 mbps, < 100 mbps.	0	0.0%
	30	Other Copper Wireless	0	0.0%			10	> 100 mbps, < 1 gbps.	0	0.0%
	40	Cable Modem-DOCSIS 3.0	0	0.0%				ZZ "null"	16	40.0%
	41	Cable Modem-Other	0	0.0%						
	50	Optical Carrier/Fiber	0	0.0%			2	>200 kps, < 768 kps.	6	15.0%
	60	Satellite	0	0.0%			3	> 768 kps, < 1.5 mbps.	17	42.5%
	70	Terrestrial Fixed Wireless-Unlicensed	13	32.5%		Max. Advertised Upload Speed	4	> 1.5 mbps, < 3 mbps.	9	22.5%
	71	Terrestrial Fixed Wireless-Licensed	13	32.5%			5	> 3 mbps, < 6 mbps.	6	15.0%
	80	Terrestrial Mobile Wireless	14	35.0%			6	> 6 mbps, < 10 mbps.	2	5.0%
	90	Electrial Power Line	0	0.0%			7	> 10 mbps, < 25 mbps.	0	0.0%
	0	Other	0	0.0%			8	> 25 mbps, < 50 mbps.	0	0.0%
							9	> 50 mbps, < 100 mbps.	0	0.0%
Max. Advertised Download Speed	3	> 768 kps, < 1.5 mbps.	8	20.0%			10	> 100 mbps, < 1 gbps.	0	0.0%
	4	> 1.5 mbps, < 3 mbps.	9	22.5%			11	> 1 gbps.	0	0.0%
	5	> 3 mbps, < 6 mbps.	16	40.0%						
	6	> 6 mbps, < 10 mbps.	7	17.5%		al Upload Sp	2	>200 kps, < 768 kps.	3	7.5%

Code	Data Element	Count	%
7	> 10 mbps, < 25 mbps.	0	0.0%
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%

Data Type	Code	Data Element	Count	%
Spectrum	1	800 Mhz Spectrum Used	2	5.0%
	2	700 Mhz Spectrum Used	5	12.5%
	3	1900 Mhz Spectrum Used	4	10.0%
	4	1700 Mhz Spectrum Used	5	12.5%
	5	2500 Mhz Spectrum Used	4	10.0%
	6	Unlicensed Spectrum Used	18	45.0%
	7	Specialist Mobile Radio Service	2	5.0%
	8	Wireless Communication Service	0	0.0%
	9	Satilite	0	0.0%

Code	Data Element	Count	%
3	> 768 kps, < 1.5 mbps.	16	40.0%
4	> 1.5 mbps, < 3 mbps.	2	5.0%
5	> 3 mbps, < 6 mbps.	2	5.0%
6	> 6 mbps, < 10 mbps.	1	2.5%
7	> 10 mbps, < 25 mbps.	0	0.0%
8	> 25 mbps, < 50 mbps.	0	0.0%
9	> 50 mbps, < 100 mbps.	0	0.0%
10	> 100 mbps, < 1 gbps.	0	0.0%
ZZ "null"		16	40.0%

Community Anchor Insititution

Data Type	Code	Data Element	Count	%	Data Type	Code	Data Element	Count	%
Record Details		Total Records	5515			1	< 200 kps.	0	0.0%
						2	>200 kps, < 768 kps.	125	2.3%
Anchor Category	1	School-K through 12	2109	38.2%	Max. Advertised Upload Speed	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%		U	Unknown	0	0.0%
	60	Satellite	14	0.3%					

	Code	Data Element	Count	%		Data Type		Code	Data Element	Count	BB Info
	70	Terrestrial Fixed Wireless-Unlicensed	27	0.5%		Lat/Long Accuracy	1	Lat/Long thT Flls within the State	5515	
	71	Terrestrial Fixed Wireless-Licensed	77	1.4%			2	Total Lat/Long	5515	100%
	80	Terrestrial Mobile Wireless	0	0.0%						
	90	Electrial Power Line	0	0.0%		Anchor Names		Total Count Anchors Names	5515	
	0	Other	0	0.0%				Disticnt Count of Anchor Names	5368	
		ZZ "null"	2109	38.2%					Count	BB Info

Max. Advertised Download Speed	Code	Data Element	Count	%		Community Anchor Institution Category Count with Broadband Information	Code	Data Element	Count	BB Info
	1	< 200 kps.	0	0.0%			1	School-K through 12	2109	1950
	2	>200 kps, < 768 kps.	0	0.0%			2	Library	252	209
	3	> 768 kps, < 1.5 mbps.	209	3.8%			3	Medical/healthcare	709	327
	4	> 1.5 mbps, < 3 mbps.	1292	23.4%			4	Public safety	1779	566
	5	> 3 mbps, < 6 mbps.	421	7.6%			5	University, college, other post-secondary	55	43
	6	> 6 mbps, < 10 mbps.	280	5.1%			6	Other community support-/gov't	601	305
	7	> 10 mbps, < 25 mbps.	913	16.6%			7	Other community support-non-/gov't	10	6
	8	> 25 mbps, < 50 mbps.	157	2.8%				Totals	5515	3406
	9	> 50 mbps, < 100 mbps.	10	0.2%						
	10	> 100 mbps, < 1 gbps.	54	1.0%		Public WI IF	1	Y	0	
	11	> 1 gbps.	70	1.3%			2	N	5515	
		ZZ "null"	2109	38.2%						

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%						
	2	Greater than 40 mbps. and less than 150 mbps.	87	9.4%		Elevation		Number of Data Points	425	

3	Greater than 150 mbps. and less than 600 mbps.	43	4.6%	
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%	

Lowest Elevation	5
Highest Elevation	225

		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	31	214		
2	0004496774	AT&T Inc.	AT&T Corp, Inc.			2	1
3	0014860522	Baja Broadband Holding Company	Baja Broadband Operating Company, LLC	995	138		
4	0003728292	Beulahland Communications, Inc.,	Beulahland Communications, Inc.,			1	1
5	0003754652	Bijou Telephone Co-op Association, Inc.	Bijou Telephone Cooperative Association, Inc.	424	845	1	3
6	0003766201	Blanca Telephone Company	Blanca Telephone Company	2922	3252		
7	0017108747	Brainstorm Internet	Brainstorm Internet			1	
8	0014778781	BySky, Inc.	BySky, Inc.			1	
9	0018626853	CenturyTel, Inc.	CenturyTel, Inc.	9884	30951		2
10	0001621127	City of Glenwood Springs	City of Glenwood Springs, Community Broadband Network	630	37	1	
11	0019898303	Cogent Communications, Inc.	Cogent Communications, Inc.	91			
12	9999	Colorado Mobile Inet, LLC	Colorado Mobile Inet, LLC			1	
13	0002147098	Columbine Telecom Company	FairPoint Communications	252	695		10
14	0004441663	Comcast Cable Communications, LLC	Comcast	46718	2987		
15	0007001977	CSC Holdings, LLC	Bresnan Communications	12117	12123		
16	0001617281	Delta County Tele-comm, Inc.	TDS Telecom	825	753		1
17	0003753753	DIECA Communications, Inc.	Covad Communications Company	126221	4532		3
18	0001629781	Dubois Telephone Exchange, Inc.,	DTE	62	153		3
19	0013339973	Eagle Communications, Inc.	Eagle Cable TV And Internet	237	29		1
20	0004317731	Eastern Slope Rural Telephone Association, Inc.	Eastern Slope Rural Telephone Association, Inc.	1998	6511		12
21	0003767852	Eschelon Telecom of Colorado, Inc.	Integra Telecom	81507	20724		
22	0004338489	Farmers Telephone Company	Farmers Telephone Company	179	907		1
23	0005059092	Farmers Telephone Company	Farmers Telecommunications			1	
24	0015575285	Front Range Internet, Inc.	Front Range Internet, Inc.	795	2		1
25	0016084683	Grand County Internet Services, Inc.	Grand County Internet Services			1	1
26	0001616200	Haxtun Telephone	Haxtun	1023	1328		
27	0019794643	HighSpeed4U	HighSpeed4U			1	1
28	0002157550	IHateToWait.com, LLC	IHateToWait			1	2
29	0015866460	Internet Colorado	Internet Colorado	364	54	1	10
30	9999	Irish & Reynolds, Inc.	Nednet			1	
31	0014175673	JAB Broadband	Skybeam, Inc.			1	418
32	0003766623	Jade Communications, LLC	Jade Communications, LLC			1	
33	0002748044	James Cable LLC	CommuniComm Services	692	3		1
34	0003728284	J.e.d. Enterprises, Inc.	J.e.d. Enterprises, Inc.	174	1499		

#	ID	Company	DBA				
35	0003723822	Level 3 Communications, LLC	Level 3 Communications, LLC				365
36	0002963528	Leap Wireless International, Inc.	Cricket Communications, Inc.,			2	
37	0018769547	Magnolia Road Internet Coop	MRIC			2	3
38	9999	Nedernet, Inc.	Nedernet, Inc.			1	
39	0003720471	New Edge Holding Company	New Edge Networks, Inc.	968	23		
40	0004312187	Nucla-Naturita Telephone Company	Nucla-Naturita Telephone Company	187	190		
41	0004311809	Nunn Telephone Company	Nunn Commuicatio, LLC	199	679		1
42	0015246895	Open Range Communications Inc.	Open Range Communications Inc.			1	
43	9999	OurayNet	OurayNet			1	1
44	0004314316	Phillips County Telephone Company	PCTelecom			1	2
45	0001615889	Plains Cooperative Telephone Association, Inc.,	Plains Cooperative Telephone Association, Inc.,	1171	3726	1	47
46	0011099520	Qwest Corporation	Qwest Corporation	97927	11461		
47	0005059092	Rico Telephone Company	Rico Telephone Company	80	99		1
48	0014705602	Roggen Telephone Cooperative Company	Roggen Telephone Enterprises, Inc.			1	1
49	0001615665	Rye Telephone Company, Inc.	ghValley.net	403	337	2	2
50	0005061775	San Isabel Telecom, Inc.	San Isabel Telecom, Inc.			1	5
51	0004310769	S&T Telephone Coop Association. Inc.	S&T Telephone Coop Assoc Inc	22	29		
52	0016136327	SECOM	SECOM			1	
53	0005070933	South Park Telephone Company, LLC	ghValley.net			1	1
54	0003774593	Sprint Nextel Corporation	Sprint			2	1
55	0001616390	Strasburg Telephone Company	TDS Telecom	114	183		1
56	0003723236	Sunflower Telephone Company	FairPoint Communications	193	357		12
57	0006945950	T-Mobile USA, Inc.	T-Mobile			2	3
58	0013430244	Time Warner Cable	Time Warner Cable	931	1037		
59	0004351086	tw telecom inc.	tw telecom inc.	1050	3		2
60	0003290673	Verizon Wireless	Verizon Wireless			4	
61	0015360456	Viaero Wireless	Viaero Wireless			1	
62	0001616192	Wiggins Telephone Association	Wiggins Telephone	648	2693		1
63	0006275945	XO Communications, LLC	XO Communications Services, Inc. (Affiliated Entity)	839	53		

NOTE

	0003723822	Level 3 Communications, LLC	Level 3 Communications, LLC	466 Service Address

Distinct Speed Tiers Provided

	Technology Codes	Allowable 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	1915	10	3	2	11514
10	3	3	7250	10	3	3	7248
10	4	2	25453	10	4	2	19852
10	4	3	29412	10	4	3	25582
10	4	4	80	10	5	2	27237
10	5	2	4431	10	5	3	8250
10	5	3	10617	10	6	2	2128
10	5	4	240	10	6	3	17716
10	5	5	295	10	7	3	26899
10	6	2	9793	10	7	4	18915
10	6	3	36535	10	8	4	8457
10	7	3	37785	10	8	5	8457
10	7	4	18915	10	8	7	23997
10	8	4	46125	10	ZZ	ZZ	17380
10	8	5	8457	20	3	3	1749
10	8	7	23997	20	4	4	62721
20	3	3	851	20	6	6	53358
20	4	4	10646	20	ZZ	ZZ	16
20	5	5	9012	30	3	3	3
20	6	6	53358	30	4	4	8898
30	3	3	452	30	5	5	69953

30	4	4	9312		30	6	6	36

30	4	4	9312	30	6	6	36
30	5	5	70076	30	7	7	113
30	6	6	90	30	8	7	1405
30	7	7	194	30	8	8	54
30	8	7	1405	30	ZZ	ZZ	1163
30	8	8	96	41	5	4	695
41	5	4	695	41	7	4	266
41	6	3	49705	41	ZZ	ZZ	77046
41	6	6	1133	50	5	3	263
41	7	3	26208	50	11	11	466
41	7	4	266	50	ZZ	ZZ	2768
50	3	3	15	70	4	3	2
50	4	4	4	70	5	2	1
50	5	3	263	70	5	3	2
50	5	5	14	70	5	4	1
50	6	6	15	70	5	5	1
50	7	3	996	70	6	6	1
50	7	5	605	70	ZZ	ZZ	5
50	7	7	85	71	3	3	4
50	8	8	18	71	4	3	2
50	9	9	40	71	5	3	1
50	10	10	941	71	ZZ	ZZ	6
50	11	11	35	80	3	2	1
70	3	3	1	80	3	3	3
70	4	3	2	80	4	2	1
70	5	2	1	80	4	3	1
70	5	3	4	80	5	3	1
70	5	4	1	80	6	4	1
70	5	5	2	80	6	5	1
70	6	2	1	80	ZZ	ZZ	5
70	6	6	1				
71	3	3	4				
71	4	3	1				
71	4	4	2				
71	5	3	2				
71	5	5	2				
71	6	3	1				
71	6	6	1				
80	3	2	1				
80	4	2	1				
80	4	3	1				

80	4	4	2
80	5	3	1
80	5	4	3
80	6	4	1
80	6	5	2