Colorado Broadband Data & Development Program

October 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 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, 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. For the October 2012 delivery, OIT attempted to contact all 125 known potential service providers to contribute data toward the CBDDP. Of the identified potential providers, 35 provided data updates, 9 new service providers were added to the dataset, and 30 providers declared "no data change" from the last data submission. 42 of the providers were non-responsive and 6 would not provide data to the CBDDP.

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. See the Data Delivery Report at the end of this document for more details on the data.

Service Providers	October 1, 2012
Potential Identified Providers	**129**
Data Sets Delivered to NTIA	74
Non Responsive Providers	42
Not a Broadband Provider	1
Will Not Provide Data	6
Out of Business	6

The following table describes service providers included in the current data delivery.

Service Provider Updates	October 1, 2012
New in Data Set	9
Updated Data	35
Responded "No Data Change"	30
Data Sets Delivered to NTIA	**74**

The CBDDP is very pleased with the progress that has been made in promoting speed tests among reporting CAIs. As shown below, 32% (or 1,663 of 5,226) of the data collected for CAIs is from speed tests. The CBDDP has not significantly expanded the number of CAIs submitting speed test information between April 2012 and this delivery. However, with the hiring of new GIS and planning staff within OIT, we expect to make a more concerted effort to collect additional CAI information or update the data collected last year. The following table shows the number of community anchor institutions that have been identified in the state.

Community Anchor Institutions	October 1, 2012		
	Identified	Collected	Includes Speed Test
Cat. 1 - School K -12	2109	2082	974
Cat. 2 - Library	252	251	14
Cat. 3 - Medical/Healthcare	709	693	143
Cat. 4 - Public Safety	1779	1591	305
Cat. 5 - University/College	55	55	42
Cat. 6 - Other Government	601	546	179
Cat. 7 - Other non-Government	10	8	6
TOTALS	5515	5226	1663

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 October 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 Mobile Coverage Areas
8. FCC Speed Test Validation
9. Crowd Sourcing
10. 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 documentation demonstrating that the data has 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 SBDD Data Package
- Cross references and creates statistical tables of technology type and valid speed combinations for both Service Provider and CAI data
- Compares FCC assigned Frequency Reference Numbers (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 April 2012 delivery and the October 2012 delivery. First is the addition of new providers and deletion of old providers. The second type of data change refers to receiving new data from existing providers, and therefore, the coverage was updated to reflect changes in service by these providers. The third type of data change is from the

improved processing techniques implemented by the OIT team. OIT analyzed and reprocessed all data provided by the former third party contractor, Critigen, to determine the accuracy of their data processing. OIT's more comprehensive processing techniques resulted in improved accuracy of coverage area. The following table shows the percent change of number of features from April 2012 to October 2012.

	Census Blocks		Road Segments		Wireless Service		Middle Mile		Address Pts	
	Number of Providers	% Features Changed	Number of Providers	% Features Changed	Number of Providers	% Features Changed	Number of Providers	% Features Changed	Number of Providers	% Features Changed
New Providers	2	100%	2	100%	7	100%	1	100%	1	100%
Deleted provider	1	-100%	1	-100%	3	-100%	2	-100%	0	0%
Received new data	21	5%	20	14%	20	13%	7	-1%	0	0%
Re-processed existing data	6	56%	6	14%	3	0%	8	-4%	0	0%
No Changes	18	0%	18	0%	18	0%	37	0%	2	0%

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

OIT compares service provider coverage areas to the following third party data sets: 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 area, geometry, and attribution provided for the technology type, and assigns a categorical assessment of the match between the CBDDP data and each third party dataset. This assessment is necessarily subjective as the third party data sets are sometimes very crude in their spatial resolution, making it 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 validation assessments based on the tests described below and communicated results to providers for verification of speed accuracy within the provider coverage area.

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, 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, 1,048 of those tests specifically identified the service provider. The CBDDP uses all of the CAI speed tests, regardless of provider information because this gives a more comprehensive perspective of the comparison between the speeds at each institution and the potential advertised service in their area.

The following table compares the speed tier for the CAI speed test to the maximum advertized speed tier by any service provider for that particular census block. A similar test also compared the CAI tests to the minimum advertised speed by any providers that reported service in that area, and the table with these results is 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	-8	-7	-6	-5	-4	-3	-2	-1	0	1	2	3	4	5	6	7	
School K - 12	3	16	29	35	110	83	306	157	103	53	16	14	6	0	0	0	931
Library	0	1	1	1	0	2	4	3	1	1	0	0	0	0	0	0	14
Healthcare	0	4	6	15	24	23	26	30	6	6	0	2	0	0	0	0	142
Public Safety	0	1	14	42	33	68	59	41	26	11	2	1	0	0	0	0	298
University, college	0	0	0	4	2	3	5	6	8	7	4	2	0	0	1	0	42
Other Government	1	1	7	8	21	32	47	20	20	9	2	4	0	0	0	0	172
Other Non-Government	0	0	0	0	1	1	3	0	0	0	0	0	0	0	0	0	5
Totals	4	23	57	105	191	212	450	257	164	87	24	23	6	0	1	0	1604
Totals	1299								164	141							1604

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	-8	-7	-6	-5	-4	-3	-2	-1	0	1	2	3	4	5	6	7	
School K - 12	0	0	0	4	18	38	78	117	122	134	215	129	58	11	6	1	931
Library	0	0	1	1	0	2	2	5	0	1	1	0	1	0	0	0	14
Healthcare	0	0	1	1	9	16	29	34	7	22	11	6	4	2	0	0	142
Public Safety	0	0	0	3	12	27	46	61	62	30	27	24	5	1	0	0	298
University, college	0	0	0	0	0	1	0	4	5	1	4	13	5	3	3	3	42
Other Government	0	0	1	1	11	17	21	29	41	18	13	12	4	4	0	0	172
Other Non-Government	0	0	0	0	1	1	2	0	1	0	0	0	0	0	0	0	5
Totals	0	0	3	10	51	102	178	250	238	206	271	184	77	21	9	4	1604
Totals	594								238	772							1604

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. Tests continued until either four secondary points (beyond the primary points) were collected or until at least two of the secondary tests failed (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. All tests 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.
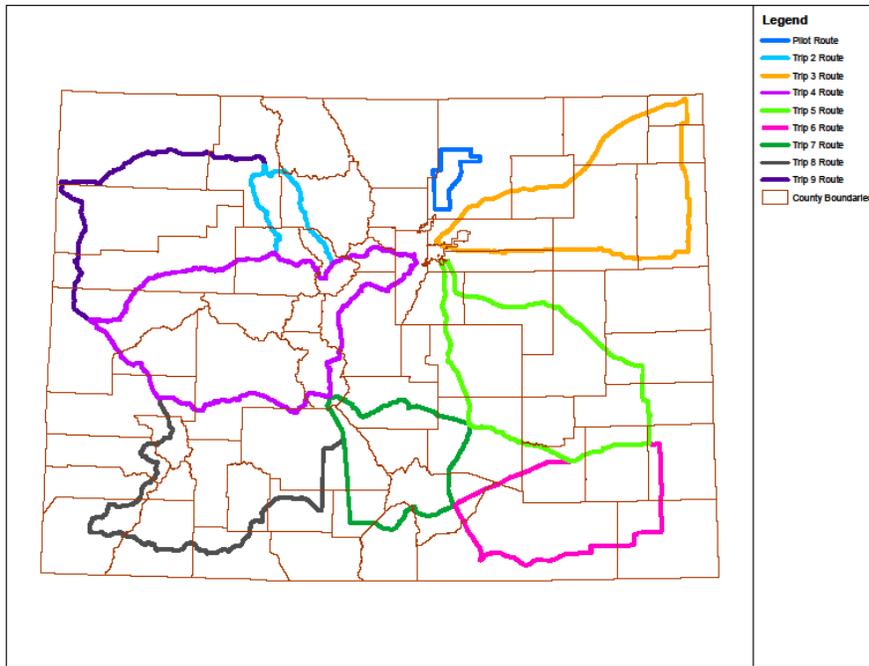
Figure 1: The following graphic is a general depiction of the routes used for the drive testing.

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 submitted to the CBDDP by that service 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	
	0	1	90	475	390	164	1	0	1121
Totals	566				390	165			1121
ATT								
	Tiers Slower				Same Tier	Tiers Faster			Total
Number of Speed Tiers Slower or Faster	< 768 Kbps	-3	-2	-1	0	1	2	3	
	0	0	89	140	83	50	0	0	362
Totals	229				83	50			362
Sprint								
	Tiers Slower				Same Tier	Tiers Faster			Total

Number of Speed Tiers Slower or Faster	< 768 Kbps	-3	-2	-1	0	1	2	3	
	0	1	1	143	163	23	1	0	332
Totals	145				163	24			332

Verizon									
	Tiers Slower				Same Tier	Tiers Faster			Total
Number of Speed Tiers Slower or Faster	< 768 Kbps	-3	-2	-1	0	1	2	3	
	0	0	0	192	144	91	0	0	427
Totals	192				144	91			427

The CBDDP has had discussions with a private vendor of mobile speed testing services to obtain the data they've collected from their devices and application installed in vehicles of local agencies subscribing to their service. This will significantly increase the magnitude of mobile speed tests.

8. FCC Speed Test 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 or fixed wireless locations. The Mobile Data includes speed tests collected using the Mobile App on a mobile device (i.e. iPhone or Android). The first two tables below compare the speed tier of the FCC CBT speed tests to the maximum and minimum advertised speed tiers reported by any service providers for each location. The third table below compares the speed tier of the FCC Mobile speed test to individual mobile broadband providers in the CBDDP dataset.

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	6	101	1865	1436	3291	2987	6489	2147	869	366	81	28	2	0	0	0	0	0	19668
Totals	18322								869	477									19668

FCC CBT Data Speed Tests Compared to Minimum 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	
Minimum	0	6	16	123	321	741	1981	2634	2762	2812	4634	3264	1400	209	33	14	o	o	20950
Totals	5822								2762	12366									20950

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	-6	-5	-4	-3	-2	-1	0	1	2	3	4	5	6	7	
Composite															
	11366	17953	33653	44697	79627	92094	94735	70227	76640	32446	41093	196	11	9	594747
Totals	279390						94735	220622							594747
AT&T Inc.															
	0	0	12436	19808	19484	20950	22144	12560	15546	124	2	2	2	0	123058
Totals	72678						22144	28236							123058
Leap Wireless International, Inc.															
	0	0	0	0	10956	17005	16424	18150	19468	10763	14110	54	2	2	106934
Totals	27961						16424	62549							106934
Nucla-Naturita Telephone Company															
	0	0	0	1	0	0	0	1	0	0	0	0	0	0	2
Totals	1						O	1							2
Sprint Nextel Corporation															
	0	0	3830	5526	8497	11525	11750	7688	8377	2773	3642	20	1	1	63630
Totals	29378						11750	22502							63630
T-Mobile USA, Inc.															
	5819	9177	8958	9917	10711	6273	7811	585	209	273	7	0	0	0	59740
Totals	50855						7811	1074							59740
Verizon Wireless															
	5456	8646	8321	9414	29951	36335	36598	31243	33040	18513	23332	120	6	6	240981
Totals	98123						36598	106260							240981
Viaero Wireless															
	91	130	108	31	28	6	8	0	0	0	0	0	0	0	402
Totals	394						8	0							402

9. Crowd Sourcing

Colorado broadband speed tests are collected in two ways: first, with a public speed test application, and second with a provider-only speed test application. The public speed test is located in the CBDDP mapping application (http://maps.co.gov/ColoradoBroadband) and an image of the speed test is shown below. A direct link speed test application also exists that can be placed on any website, which will help increase availability of the speed test and collect more results than the CBDDP mapping application alone. Using this application, the general population can conduct speed tests from their home or office. 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 purpose is to collect reports of service from citizens and Community Anchor Institutes in order to compare against the provider data.

The provider-only speed test application allows providers to submit speed tests during service calls or installations, at which time they are able to test the unrestricted bandwidth.   These speed tests show actual available speed when not restricted by consumer speed packages.

The CBDDP is still working to collect a significant number of speed tests using the aforementioned methods, which will then be used to compare to provider data.
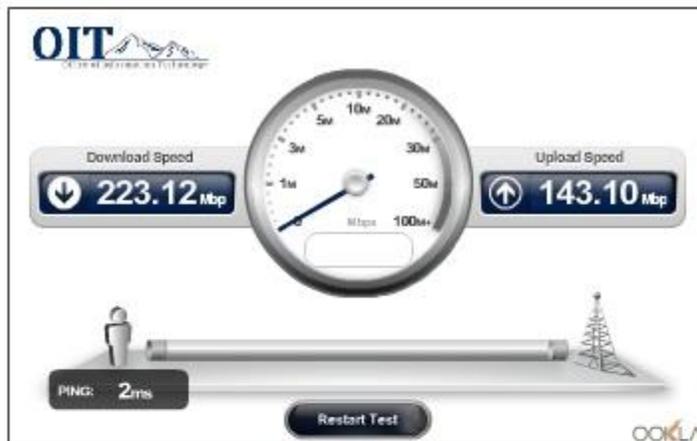
10. Surveys

The CBDDP prepared and distributed a survey for residences and businesses requesting information about their broadband availability, their use of broadband, actual speeds received, and transmission technology. Approximately 1100 surveys were collected from rural, underserved, and un-served communities across the state, and nearly 800 of those surveys included speed tests. Similar to the data verification shown above, the reports provide a sense of the actual speeds in use or available to residents and businesses across the state. The following table compares the speed tier reported in the survey speed test data to the maximum advertised speed tier by any service provider for that location.

SURVEY DATA															
Results from Residential and Business Locations															
	Tiers Slower							**Same Tier**	**Tiers Faster**							**Total**
Speed Tier	<-7	-6	-5	-4	-3	-2	-1	0	1	2	3	4	5	6	>7	
	6	15	39	100	72	255	139	49	10	12	7	1	5	3		713
Totals	626							49	38							713

Summary of Process

The CBDDP follows the data collection process outlined on the National Broadband Map website: http://www.broadbandmap.gov/about/technical-overview.   A more detailed description of the data processing methods is provided in the Process Guide, which is included with the data submission (CO_Process_Guide_2012_10_01.pdf).

During the first two years of the program, the CBDDP contracted a third party business (Critigen) to perform data processing. Starting with the April 1, 2012 delivery, the CBDDP hired staff and brought this process in-house. The CBDDP will continue with in-house staff through the remainder of the program to October 31, 2014. In-sourcing has improved data quality and increased the number of providers reporting in comparison to previous deliveries. The CBDDP has implemented the following process, which may vary from other state programs.

Data Collection
1. The data gathering process begins by identifying and contacting potential broadband providers. Participation in the program is voluntary, but many providers choose to support this effort.
2. The CBDDP reaches out to providers who have not previously submitted data, in order to create a more comprehensive state dataset.
3. The CBDDP also contacts each currently participating provider to allow them to report data changes or confirm that existing data is still accurate.
4. The CBDDP works closely with providers to help find the best and most accurate way to submit data. We encourage a uniform data submission across all providers, but accept data in various formats dependent on the provider's software limitations.

Data Processing
1. Reference layers include the U.S. Census Bureau 2010 TIGER/Line Shapefile Census Blocks and Roads.
2. Landline data is divided into three separate categories: census blocks less than two square miles, census block greater than two square miles, and service address points
   - For census blocks less than two square miles, the entire census block is presumed to have coverage if a service provider reports broadband service within that census block.

- For census blocks greater than two square miles, the CBDDP reports service along road segments.
- Service addresses represent providers who provide service to specific business locations or CAIs, but do not advertise or provide service to residences.

The data submitted by the provider is used to collect census blocks and road segments from the reference layers (US Census Bureau TIGER/Line).

Data is often submitted as address or point specific information, in which case a 150 foot buffer is drawn around each point and the resulting coverage is used to select the appropriate census blocks and road segments. The CBDDP also implements a network analysis to transform DSLAM (digital subscriber line access multiplexer) locations into a service network area, which is then used to spatially select Census Blocks and Road Segments.

3. Wireless data submitted as a service coverage area is added directly to the provider coverage
4. Wireless data submitted as tower locations is processed using signal propagation software to create a coverage plot.
5. Middle mile locations are reported by the providers using either addresses or coordinates. Central office locations and wireless towers are included in the BB_ConnectionPoint_MiddleMile.
6. Representing typical speeds continues to be an issue, as only two thirds of the providers report typical speed information.
7. Based on clarifications from the NTIA, the CBDDP did not provide any features in the BB_Service_Overview feature class as more granular speed information was provided in the BB_Service_CensusBlock, BB_Service_RoadSegment and BB_Service_Address feature classes.
8. The CBDDP is not currently collecting pricing information.
9. Various validation methods are implemented to check the data accuracy, as described "Validation and Verification" section of this document.

Data Submission

1. Before submitting data to the NTIA, the CBDDP compiles the data from each provider into a single dataset using the data model specified by the NTIA.
2. The NTIA then integrates the CBDDP's dataset into the National Broadband Map dataset.

Data Summary and Feature Class Statistical Tables

File Summary		
File Type		**Number of Records**
Total Records in all Files		**612628**
Census Block < 2 sq. miles		**453218**
Street Segments		**151653**
Wireless Shape File		**66**
Service Address		**1025**
BB Service Overview		**0**
Community Anchor Institutions		**5515**
Middle Mile		**1151**
Metadata Provided for Geospatial Data		**Yes**

Provider Information		
		Number of Records
Number of ISPs Provided		**74**

Census Blocks ‹ 2 sq. miles

Left Panel

Data Type	Code	Data Element	Count	%
Records Details		Total Records	453218	
		Census Blocks < 2 sq. miles with Broadband	147651	
		Census Blocks < 2 sq. miles in State (with & without broadband)	192101	
		Census Blocks > 2 sq. miles in the State (with & without broadband)	8961	
		Total Census Blocks in the State (with & without broadband)	201062	
Services Provider Details		Number of Distinct Providers	42	
		Number of Distinct "Doing Business As"	40	
		Number of Distinct FRN	43	
Technology	10	Asymmetric xDSL	188595	41.6%
	20	Symmetric xDSL	64801	14.3%
	30	Other Copper Wireless	77705	17.1%
	40	Cable Modem-DOCSIS 3.0	54248	12.0%
	41	Cable Modem-Other	19230	4.2%
	50	Optical Carrier/Fiber	48639	10.7%
	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.	9330	2.1%
	4	> 1.5 mbps, < 3 mbps.	56672	12.5%
	5	> 3 mbps, < 6 mbps.	112054	24.7%
	6	> 6 mbps, < 10 mbps.	75654	16.7%
	7	> 10 mbps, < 25 mbps.	104169	23.0%
	8	> 25 mbps, < 50 mbps.	31670	7.0%
	9	> 50 mbps, < 100 mbps.	61185	13.5%
	10	> 100 mbps, < 1 gbps.	2466	0.5%
	11	> 1 gbps.	18	0.0%
Provider Type	1	Provider	453218	100.0%
	2	Reseller	0	0.0%
End User Category	1	Residential	451118	99.5%
	2	Governmental	2100	0.5%

Right Panel

Data Type	Code	Data Element	Count	%
Typical Download Speed	3	>= 768 kbps. < 1.5 mbps.	16136	3.6%
	4	>= 1.5 mbps. < 3 mbps.	42506	9.4%
	5	>= 3 mbps. < 6 mbps.	102893	22.7%
	6	>= 6 mbps. < 10 mbps.	50656	11.2%
	7	>= 10 mbps. < 25 mbps.	81206	17.9%
	8	>= 25 mbps. < 50 mbps.	30541	6.7%
	9	> 50 mbps, < 100 mbps.	0	0.0%
	10	> 100 mbps, < 1 gbps.	0	0.0%
	11	> 1 gbps.	0	0.0%
		ZZ "null"	129280	28.5%
Max. Advertised Upload Speed	2	>200 kps, < 768 kps.	27614	6.1%
	3	>= 768 kbps. < 1.5 mbps.	98290	21.7%
	4	> 1.5 mbps, < 3 mbps.	83223	18.4%
	5	> 3 mbps, < 6 mbps.	107209	23.7%
	6	> 6 mbps, < 10 mbps.	97531	21.5%
	7	> 10 mbps, < 25 mbps.	29104	6.4%
	8	> 25 mbps, < 50 mbps.	4079	0.9%
	9	> 50 mbps, < 100 mbps.	5943	1.3%
	10	> 100 mbps, < 1 gbps.	207	0.0%
	11	> 1 gbps.	18	0.0%
Typical Upload Speed	2	>200 kps, < 768 kps.	49451	10.9%
	3	> 768 kps, < 1.5 mbps.	59574	13.1%
	4	> 1.5 mbps, < 3 mbps.	65714	14.5%
	5	> 3 mbps, < 6 mbps.	83951	18.5%
	6	> 6 mbps, < 10 mbps.	40222	8.9%
	7	> 10 mbps, < 25 mbps.	22070	4.9%
	8	> 25 mbps, < 50 mbps.	2956	0.7%
	9	> 50 mbps, < 100 mbps.	0	0.0%
	10	> 100 mbps, < 1 gbps.	0	0.0%
	11	> 1 gbps.	0	0.0%
		ZZ "null"	129280	28.5%

Street Segment

Data Type	Code	Data Element	Count	%
Record Details		Total Records	151653	
Services Provider Details		Number of Distinct Providers	40	
		Number of Distinct "Doing Business As"	39	
		Number of Distinct FRN	41	
Technology	10	Asymmetric xDSL	85155	56.2%
	20	Symmetric xDSL	15361	10.1%
	30	Other Copper Wireless	5298	3.5%
	40	Cable Modem-DOCSIS 3.0	10214	6.7%
	41	Cable Modem-Other	7541	5.0%
	50	Optical Carrier/Fiber	28084	18.5%
	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.	4364	2.9%
	4	> 1.5 mbps, < 3 mbps.	43286	28.5%
	5	> 3 mbps, < 6 mbps.	18552	12.2%
	6	> 6 mbps, < 10 mbps.	29017	19.1%
	7	> 10 mbps, < 25 mbps.	41952	27.7%
	8	> 25 mbps, < 50 mbps.	3145	2.1%
	9	> 50 mbps, < 100 mbps.	11186	7.4%
	10	> 100 mbps, < 1 gbps.	151	0.1%
	11	> 1 gbps.	0	0.0%
Provider Type	1	Provider	151653	100.0%
	2	Reseller	0	0.0%
End User Name	1	Residential	151595	100.0%
	2	Governmental	58	0.0%

Data Type	Code	Data Element	Count	%
Typical Download Speed	3	> 768 kps, < 1.5 mbps.	5046	3.3%
	4	> 1.5 mbps, < 3 mbps.	26509	17.5%
	5	> 3 mbps, < 6 mbps.	11767	7.8%
	6	> 6 mbps, < 10 mbps.	18413	12.1%
	7	> 10 mbps, < 25 mbps.	29853	19.7%
	8	> 25 mbps, < 50 mbps.	3008	2.0%
	9	> 50 mbps, < 100 mbps.	0	0.0%
	10	> 100 mbps, < 1 gbps.	0	0.0%
	11	> 1 gbps.	0	0.0%
		ZZ "null"	57057	37.6%
Max. Advertised Upload Speed	2	>200 kps, < 768 kps.	21825	14.4%
	3	> 768 kps, < 1.5 mbps.	32278	21.3%
	4	> 1.5 mbps, < 3 mbps.	43169	28.5%
	5	> 3 mbps, < 6 mbps.	18026	11.9%
	6	> 6 mbps, < 10 mbps.	32862	21.7%
	7	> 10 mbps, < 25 mbps.	3264	2.2%
	8	> 25 mbps, < 50 mbps.	131	0.1%
	9	> 50 mbps, < 100 mbps.	97	0.1%
	10	> 100 mbps, < 1 gbps.	1	0.0%
	11	> 1 gbps.	0	0.0%
Typical Upload Speed	2	>200 kps, < 768 kps.	22309	14.7%
	3	> 768 kps, < 1.5 mbps.	23353	15.4%
	4	> 1.5 mbps, < 3 mbps.	25599	16.9%
	5	> 3 mbps, < 6 mbps.	5991	4.0%
	6	> 6 mbps, < 10 mbps.	15200	10.0%
	7	> 10 mbps, < 25 mbps.	2144	1.4%
	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"	57057	37.6%

Wireless

Data Type	Code	Data Element	Count	%	Data Type	Code	Data Element	Count	%
Record Details		Total Records	66			2	>200 kps, < 768 kps.	0	0.0%
					Typical Download Speed	3	> 768 kps, < 1.5 mbps.	16	24.2%
Services Provider Details		Number of Distinct Providers	45			4	> 1.5 mbps, < 3 mbps.	5	7.6%
		Number of Distinct "Doing Business As"	43			5	> 3 mbps, < 6 mbps.	12	18.2%
		Number of Distinct FRN	42			6	> 6 mbps, < 10 mbps.	8	12.1%
Technology	10	Asymmetric xDSL	0	0.0%		7	> 10 mbps, < 25 mbps.	0	0.0%
	20	Symmetric xDSL	0	0.0%		8	> 25 mbps, < 50 mbps.	0	0.0%
	30	Other Copper Wireless	0	0.0%		9	> 50 mbps, < 100 mbps.	0	0.0%
	40	Cable Modem-DOCSIS 3.0	0	0.0%		10	> 100 mbps, < 1 gbps.	0	0.0%
	41	Cable Modem-Other	0	0.0%			ZZ "null"	25	37.9%
	50	Optical Carrier/Fiber	0	0.0%		2	>200 kps, < 768 kps.	16	24.2%
	60	Satellite	5	7.6%	Max. Advertised Upload Speed	3	> 768 kps, < 1.5 mbps.	22	33.3%
	70	Terrestrial Fixed Wireless-Unlicensed	27	40.9%		4	> 1.5 mbps, < 3 mbps.	6	9.1%
	71	Terrestrial Fixed Wireless-Licensed	17	25.8%		5	> 3 mbps, < 6 mbps.	12	18.2%
	80	Terrestrial Mobile Wireless	17	25.8%		6	> 6 mbps, < 10 mbps.	8	12.1%
	90	Electrical Power Line	0	0.0%		7	> 10 mbps, < 25 mbps.	2	3.0%
	0	Other	0	0.0%		8	> 25 mbps, < 50 mbps.	0	0.0%
Max. Advertised Download Speed	3	> 768 kps, < 1.5 mbps.	13	19.7%		9	> 50 mbps, < 100 mbps.	0	0.0%
	4	> 1.5 mbps, < 3 mbps.	8	12.1%		10	> 100 mbps, < 1 gbps.	0	0.0%
	5	> 3 mbps, < 6 mbps.	19	28.8%		11	> 1 gbps.	0	0.0%
	6	> 6 mbps, < 10 mbps.	18	27.3%		2	>200 kps, < 768 kps.	15	22.7%
	7	> 10 mbps, < 25 mbps.	7	10.6%	Typical Upload Speed	3	> 768 kps, < 1.5 mbps.	19	28.8%
	8	> 25 mbps, < 50 mbps.	1	1.5%		4	> 1.5 mbps, < 3 mbps.	3	4.5%
	9	> 50 mbps, < 100 mbps.	0	0.0%		5	> 3 mbps, < 6 mbps.	4	6.1%
	10	> 100 mbps, < 1 gbps.	0	0.0%		6	> 6 mbps, < 10 mbps.	0	0.0%
	11	> 1 gbps.	0	0.0%		7	> 10 mbps, < 25 mbps.	0	0.0%
Spectrum	1	800 MHz Spectrum Used	3	4.5%		8	> 25 mbps, < 50 mbps.	0	0.0%
	2	700 MHz Spectrum Used	7	10.6%		9	> 50 mbps, < 100 mbps.	0	0.0%
	3	1900 MHz Spectrum Used	6	9.1%		10	> 100 mbps, < 1 gbps.	0	0.0%
	4	1700 MHz Spectrum Used	6	9.1%			ZZ "null"	25	37.9%
	5	2500 MHz Spectrum Used	4	6.1%					
	6	Unlicensed Spectrum Used	30	45.5%					
	7	Specialist Mobile Radio Service	4	6.1%					
	8	Wireless Communication Service	1	1.5%					
	9	Satellite	5	7.6%					

Service Addresses

Data Type	Code	Data Element	Count	%
Record Details		Total Records	1025	
Services Provider Details		Number of Distinct Providers	3	
		Number of Distinct "Doing Business As"	3	
		Number of Distinct FRN	3	
Technology	10	Asymmetric xDSL	0	0.0%
	20	Symmetric xDSL	0	0.0%
	30	Other Copper Wireless	0	0.0%
	40	Cable Modem-DOCSIS 3.0	0	0.0%
	41	Cable Modem-Other	0	0.0%
	50	Optical Carrier/Fiber	1025	100.0%
	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.	0	0.0%
	4	> 1.5 mbps, < 3 mbps.	0	0.0%
	5	> 3 mbps, < 6 mbps.	0	0.0%
	6	> 6 mbps, < 10 mbps.	0	0.0%
	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.	1025	100.0%
Provider Type	1	Provider	466	45.5%
	2	Reseller	559	54.5%
End User Name	1	Residential	43	4.2%
	2	Governmental	516	50.3%
	4	Unknown	466	45.5%

Data Type	Code	Data Element	Count	%
Typical Download Speed	3	> 768 kps, < 1.5 mbps.	0	0.0%
	4	> 1.5 mbps, < 3 mbps.	0	0.0%
	5	> 3 mbps, < 6 mbps.	0	0.0%
	6	> 6 mbps, < 10 mbps.	0	0.0%
	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.	516	50.3%
	11	> 1 gbps.	466	45.5%
		ZZ "null"	43	4.2%
Max. Advertised Upload Speed	2	>200 kps, < 768 kps.	0	0.0%
	3	> 768 kps, < 1.5 mbps.	0	0.0%
	4	> 1.5 mbps, < 3 mbps.	0	0.0%
	5	> 3 mbps, < 6 mbps.	0	0.0%
	6	> 6 mbps, < 10 mbps.	0	0.0%
	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.	35	3.4%
	11	> 1 gbps.	990	96.6%
Typical Upload Speed	2	>200 kps, < 768 kps.	0	0.0%
	3	> 768 kps, < 1.5 mbps.	0	0.0%
	4	> 1.5 mbps, < 3 mbps.	0	0.0%
	5	> 3 mbps, < 6 mbps.	0	0.0%
	6	> 6 mbps, < 10 mbps.	0	0.0%
	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.	516	50.3%
	11	> 1 gbps.	466	45.5%
		ZZ "null"	43	4.2%

Community Anchor Institution

Data Type	Code	Data Element	Count	%
Record Details		Total Records	5515	
Anchor Category	1	School-K through 12	2109	38.2%
	2	Library	252	4.6%
	3	Medical/healthcare	709	12.9%
	4	Public safety	1779	32.3%
	5	University, college, other post-secondary	55	1.0%
	6	Other community support/gov't	601	10.9%
	7	Other community support/non-gov't	10	0.2%
Technology	10	Asymmetric xDSL	1216	22.0%
	20	Symmetric xDSL	20	0.4%
	30	Other Copper Wireless	1934	35.1%
	40	Cable Modem-DOCSIS 3.0	5	0.1%
	41	Cable Modem-Other	146	2.6%
	50	Optical Carrier/Fiber	1787	32.4%
	60	Satellite	14	0.3%
	70	Terrestrial Fixed Wireless-Unlicensed	27	0.5%
	71	Terrestrial Fixed Wireless-Licensed	77	1.4%
	80	Terrestrial Mobile Wireless	0	0.0%
	90	Electrical Power Line	0	0.0%
	0	Other	0	0.0%
		ZZ "null"	289	5.2%
Max. Advertised Download Speed	1	< 200 kps.	0	0.0%
	2	>200 kps, < 768 kps.	0	0.0%
	3	> 768 kps, < 1.5 mbps.	231	4.2%
	4	> 1.5 mbps, < 3 mbps.	1707	31.0%
	5	> 3 mbps, < 6 mbps.	992	18.0%
	6	> 6 mbps, < 10 mbps.	433	7.9%
	7	> 10 mbps, < 25 mbps.	1430	25.9%
	8	> 25 mbps, < 50 mbps.	213	3.9%
	9	> 50 mbps, < 100 mbps.	67	1.2%
	10	> 100 mbps, < 1 gbps.	81	1.5%
	11	> 1 gbps.	72	1.3%
		ZZ "null"	289	5.2%

Data Type	Code	Data Element	Count	%
Max. Advertised Upload Speed	1	< 200 kps.	0	0.0%
	2	>200 kps, < 768 kps.	214	3.9%
	3	> 768 kps, < 1.5 mbps.	666	12.1%
	4	> 1.5 mbps, < 3 mbps.	1806	32.7%
	5	> 3 mbps, < 6 mbps.	1029	18.7%
	6	> 6 mbps, < 10 mbps.	446	8.1%
	7	> 10 mbps, < 25 mbps.	782	14.2%
	8	> 25 mbps, < 50 mbps.	97	1.8%
	9	> 50 mbps, < 100 mbps.	53	1.0%
	10	> 100 mbps, < 1 gbps.	61	1.1%
	11	> 1 gbps.	72	1.3%
		ZZ "null"	289	5.2%
Y/N Broadband Service	Y	Yes-Subscribers to Service	5226	94.8%
	N	No-Does Not Subscribers to Service	289	5.2%
	U	Unknown	0	0.0%
Lat/Long Accuracy	1	Lat/Long falls within the State	5515	100%
	2	Total Lat/Long	5515	100%
Anchor Names		Total Count Anchors Names	5515	
		Distinct Count of Anchor Names	5368	

Data Type	Code	Data Element	Count	BB Info
Community Anchor Institution Category Count with Broadband Information	1	School-K through 12	2109	2082
	2	Library	252	251
	3	Medical/healthcare	709	693
	4	Public safety	1779	1591
	5	University, college, other post-secondary	55	55
	6	Other community support/gov't	601	546
	7	Other community support/non-gov't	10	8
		Totals	5515	5226
Public WI-FI	1	Y	0	
	2	N	5515	

Middle Mile

Data Type	Code	Data Element	Count	%	Data Type	Code	Data Element	Count	%
Record Details		Total Records	1151		Facility Type	1	Fiber	548	47.6%
						2	Copper	4	0.3%
Services Provider Details		Number of Distinct Providers	43			3	Hybrid Fiber Coax (HFC)	1	0.1%
		Number of Distinct "Doing Business As"	41			4	Wireless	598	52.0%
		Number of Distinct FRN	41				N/A "null"		0.0%
Ownership	0	Owned	327	28.4%	Lat / Long		# of Lat/Long in State	1151	100%
	1	Leased	824	71.6%			Total Lat/Long	1151	
Facility Capacity	1	Multiple T1's and less than 40 mbps.	571	49.6%	Elevation		Number of Data Points	586	
	2	Greater than 40 mbps and less than 150 mbps.	113	9.8%			Lowest Elevation	0	
	3	Greater than 150 mbps. and less than 600 mbps.	52	4.5%			Highest Elevation	300	
	4	Greater than 600 mbps. and less than 2.4 gbps.	42	3.6%					
	5	Greater than 2.4 gbps. and less than 10 gbps.	0	0.0%					
	6	Greater than 10 gbps	373	32.4%					

	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.			4	1
4	0014860522	Baja Broadband Holding Company	Baja Broadband Operating Company, LLC	3201	280		
5	0003728292	Beulahland Communications, Inc.,	Beulahland Communications, Inc.,			2	1
6	0003754652	Bijou Telephone Co-op Association, Inc.	Bijou Telephone Cooperative Association, Inc.	424	840	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.	98786	56867		
12	0001621127	City of Glenwood Springs	City of Glenwood Springs, Community Broadband Network	673	46	1	
13	9999	Colorado Mobile Inet, LLC	Colorado Mobile Inet, LLC			1	14
14	0002147098	Columbine Telecom Company	FairPoint Communications	251	667	1	10
15	0004441663	Comcast Cable Communications, LLC	Comcast	54704	10375		
16	0007001977	CSC Holdings, LLC	Bresnan Communications	15116	6354		
17	0001617281	Delta County Tele-comm, Inc.	TDS Telecom	829	821		1
18	0003753753	DIECA Communications, Inc.	Covad Communications Company	134364	4718		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.	2220	7449		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.	5794	97		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	0018483073	Hughes Network Systems, LLC	HughesNet			1	
31	0015866460	Internet Colorado	Internet Colorado	364	54	1	10
32	0018706002	Inventive Wireless of Nebraska, LLC	Vistabeam			1	
33	0007651219	iLOKA Inc	Microtech-tel	36794	21382		
34	0014175673	JAB Broadband	Skybeam, Inc.			1	399
35	0003766623	Jade Communications, LLC	Jade Communications, LLC			1	7

#	Number	Company	DBA				
36	0002748044	James Cable LLC	CommuniComm Services	692	3		1
37	0003728284	J.e.d. Enterprises, Inc.	J.e.d. Enterprises, Inc.	203	1355		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	Mountain Broadband, LLC	Mountain Broadband			1	18
43	9999	Nedernet, Inc.	Nedernet, Inc.			1	15
44	0004312187	Nucla-Naturita Telephone Company	Nucla-Naturita Telephone Company	297	332	2	
45	0004311809	Nunn Telephone Company	Nunn Communications, LLC	199	679		1
46	9999	OurayNet	OurayNet			1	13
47	0014699953	Peetz Communications, LLC	Peetz Cooperative Telephone Company	94	176	1	
48	0004314316	Phillips County Telephone Company	PCTelecom	214	757	2	3
49	0001615889	Plains Cooperative Telephone Association, Inc.	Plains Cooperative Telephone Association, Inc.	1113	3475	1	52
50	0005059092	Rico Telephone Company	Rico Telephone Company	78	93		3
51	0014705602	Roggen Telephone Cooperative Company	Roggen Telephone Enterprises, Inc.			1	1
52	0001615665	Rye Telephone Company, Inc.	ghValley.net	894	2641	1	2
53	0005061775	San Isabel Telecom, Inc.	San Isabel Telecom, Inc.	1360	634	1	5
54	0004310769	S&T Telephone Coop Association. Inc.	S&T Telephone Coop Assoc Inc	24	29		
55	0016136327	SECOM	SECOM			2	27
56	0018756155	Skycasters, LLC	Skycasters			1	
57	0017163304	Slopeside Internet, LLC	Slopeside Internet, LLC			3	
58	0005070933	South Park Telephone Company, LLC	ghValley.net			2	1
59	0003774593	Sprint Nextel Corporation	Sprint			2	1
60	0005087457	StarBand Communications Inc.	StarBand Communications Inc.			1	
61	0001616390	Strasburg Telephone Company	TDS Telecom	111	176		1
62	0003723236	Sunflower Telephone Company	FairPoint Communications	179	359		12
63	0006945950	T-Mobile USA, Inc.	T-Mobile			3	7
64	0013430244	Time Warner Cable	Time Warner Cable	925	859		
65	0004351086	tw telecom inc.	tw telecom inc.	1261	5		2
66	0005200067	Uintah Basin Electronic Telecommunications	Strata Networks	1358	467	1	
67	0003290673	Verizon Wireless	Verizon Wireless			4	
68	0015360456	Viaero Wireless	Viaero Wireless			1	
69	0007843766	ViaSat	ViaSat Communications			2	
70	0001616192	Wiggins Telephone Association	Wiggins Telephone	658	2876		1
71	0006275945	XO Communications, LLC	XO Communications Services, Inc. (Affiliated Entity)	839	53		
72	0012579652	Zirkel Wireless, LLC	Zirkel Wireless, LLC			2	19
73	0014817357	Unite Private Networks, LLC	Unite Private Networks	516 Service Address			
74	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

	Technology Codes	Down	Up		Speed Tier Codes
10	Asymmetric xDSL	3 to 10	2 to 9	1	< 200 kps.
20	Symmetric xDSL	3 to 9	2 to 9	2	>200 kps, < 768 kps.
30	Other Copper Wireless	3 to 11	2 to 11	3	> 768 kps, < 1.5 mbps.
40	Cable Modem-DOCSIS 3.0	3 to 10	2 to 7	4	> 1.5 mbps, < 3 mbps.
41	Cable Modem-Other	3 to 7	2 to 7	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 5	2 to 4	7	> 10 mbps, < 25 mbps.
70	Terrestrial Fixed Wireless-Unlicensed	3 to 7	2 to 7	8	> 25 mbps, < 50 mbps.
71	Terrestrial Fixed Wireless-Licensed	3 to 7	2 to 7	9	> 50 mbps, < 100 mbps.
80	Terrestrial Mobile Wireless	3 to 7	2 to 7	10	> 100 mbps, < 1 gbps.
90	Electric Power Lines	3 to 5	2 to 5	11	> 1 gbps.
0	All Other	3 to 11	2 to 11		

Allowable header spans Down/Up columns.

Distinct Speed Tiers Provided

Maximum Advertised Speed				Typical Speed			
Technology	Download	Upload	Freq.	Technology	Download	Upload	Freq.
10	3	2	3581	10	3	2	11549
10	3	3	5022	10	3	3	4588
10	4	2	27513	10	4	2	29258
10	4	3	25166	10	4	3	23636
10	5	2	14032	10	5	2	22780
10	5	3	13098	10	5	3	13342
10	5	4	134	10	6	2	2753
10	6	2	2753	10	6	3	10953
10	6	3	29716	10	7	3	29086
10	6	4	1327	10	7	4	72232
10	6	5	4303	10	7	5	887
10	6	6	9669	10	8	5	10687
10	7	3	29211	10	8	7	21005
10	7	4	73529	10	ZZ	ZZ	21007
10	7	5	887	20	3	2	4441
10	7	7	1825	20	3	3	601
10	8	5	10699	20	4	4	13431
10	8	7	21005	20	5	5	1970
10	8	8	293	20	6	6	55327
20	3	3	4813	20	7	7	1940
20	4	4	6768	20	8	8	1799

Maximum Advertised Speed					Typical Speed			
Technology	Download	Upload	Freq.		Technology	Download	Upload	Freq.
20	5	3	2		20	ZZ	ZZ	653
20	5	5	8949		30	3	3	3
20	6	6	54408		30	4	2	37
20	7	7	2859		30	4	4	2653
20	8	8	2363		30	5	5	76379
30	3	3	251		30	6	6	36
30	4	4	2908		30	7	7	451
30	5	5	76585		30	7	8	1099
30	6	4	37		30	8	8	54
30	6	6	102		30	ZZ	ZZ	2292
30	7	7	1954		40	ZZ	ZZ	64462
30	7	8	1099		41	5	2	93
30	8	8	68		41	7	2	772
40	9	6	64462		41	7	5	266
41	4	2	695		41	ZZ	ZZ	25640
41	5	2	93		50	5	2	77
41	6	5	617		50	5	5	19
41	7	2	772		50	7	3	1089
41	7	3	22544		50	7	4	2731
41	7	4	2050		50	7	6	59
50	3	3	27		50	7	7	818
50	4	4	36913		50	8	8	4
50	5	5	18016		50	10	10	516
50	6	6	1752		50	11	11	466
50	7	3	1089		50	ZZ	ZZ	727714
50	7	4	2731		60	3	2	2
50	7	5	3611		60	4	2	1
50	7	7	2319		60	ZZ	ZZ	2
50	8	8	466		70	3	2	1
50	9	5	1871		70	3	3	3
50	9	9	6038		70	4	3	3
50	10	7	2407		70	5	2	3
50	10	9	2		70	5	3	3
50	10	10	208		70	5	5	1
50	11	10	35		70	6	4	2
50	11	11	1008		70	6	5	2
60	4	2	2		70	ZZ	ZZ	9
60	5	3	2		71	3	2	1
60	7	5	1		71	3	3	4
70	3	2	1		71	4	2	1
70	3	3	2		71	5	2	1

Maximum Advertised Speed					Typical Speed			
Technology	Download	Upload	Freq.		Technology	Download	Upload	Freq.
70	4	3	1		71	5	3	2
70	5	2	2		71	6	3	1
70	5	3	3		71	6	4	1
70	5	4	1		71	ZZ	ZZ	6
70	5	5	2		80	3	2	5
70	6	2	1		80	5	3	2
70	6	3	2		80	6	3	1
70	6	4	1		80	6	5	1
70	6	5	3		80	ZZ	ZZ	8
70	6	6	4					
70	7	4	1					
70	7	6	1					
70	7	7	1					
70	8	7	1					
71	3	2	1					
71	3	3	4					
71	4	2	1					
71	5	2	1					
71	5	3	3					
71	5	5	1					
71	6	3	1					
71	6	5	2					
71	6	6	3					
80	3	2	6					
80	4	2	1					
80	4	3	2					
80	5	3	1					
80	5	4	1					
80	5	5	2					
80	6	4	1					
80	7	3	1					
80	7	4	1					
80	7	5	1					