In the Matter of	**)**	
	)	
Inquiry Concerning Deployment of Advanced	**)**	GN Docket No. 17-199
Telecommunications Capability to All	**)**	
Americans in a Reasonable and Timely	**)**	October 6, 2017
Fashion	**)**	

REPLY COMMENTS OF THE INSTITUTE FOR LOCAL SELF-RELIANCE
AND
NEXT CENTURY CITIES

I.   Introduction

The Institute for Local Self-Reliance (ILSR) mission is to provide innovative strategies, working models and timely information to support environmentally sound and equitable community development. To this end, ILSR works with citizens, activists, policymakers and entrepreneurs to design systems, policies and enterprises that meet local or regional needs; to maximize human, material, natural and financial resources; and to ensure that the benefits of these systems and resources accrue to all local citizens.

Next Century Cities (NCC) is a 501(c)(3) membership organization that supports 180 communities and their elected leaders, including mayors and other municipal officials, as they seek to ensure that all residents have access to fast, affordable, and reliable broadband Internet service. Thus, NCC brings to this proceeding unique knowledge of the variety of approaches to building out broadband networks in the United States, and why it is important that communities are able to seek the broadband solutions that best fit their unique needs.

II.   Summary

ILSR and NCC strongly believe that satellite Internet access is inadequate for rural communities for today's and tomorrow's technologies. Additionally, mobile Internet access should be considered as a complement to wireline household connectivity, rather than a substitute. Furthermore, local communities should retain the ability to govern their rights-of-way as a matter of local control.

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III.   Satellite Internet Access, Touted as an Affordable Solution for Rural Regions, is not Adequate

Simply put, satellite Internet access should not be considered a technology suitable to delivering broadband within any reasonable definition. The most significant problem remains that of latency. The Commission's 2016 Measuring Broadband America Fixed Broadband Report notes "...the median latencies of satellite-based broadband services (which range from 599 ms to 629 ms) are much higher than those for terrestrial-based broadband services (which range from 12 ms to 58 ms)."[1]

Satellite services are an extreme outlier for latency, which is increasingly a limitation on modern applications that tend to expect lower latency connections. Many applications are moving into the "cloud" and expecting a reasonable ping in order to work effectively. Though this is true of many commonly-used software packages from word processing to other business applications, it is exemplified in the explosion of devices like the Amazon Echo.

Nearly 14 percent of US homes have an Echo and nearly 6 percent have the Google Home product with some 60.5 million Americans expected to use a similar device this year.[2] These devices require low latency, as they are expected to effectively converse with users.[3] The high latency with satellite makes this quite difficult and dramatically lowers their value to the user. This is a commonly used application satellite services cannot effectively deliver, along with more commonly known applications such as n-way video or audio chat and multiplayer video gaming.

Though satellite companies may advertise a variety of speeds, the real-life measurements demonstrate that satellite customers receive a vastly inferior experience than terrestrial services.

Consider the Netflix Speed Index, attached as appendices, which track 60 ISPs. In the August 2017 report, 50 of the ISPs are clustered between 3 and 4 Mbps of sustained speeds. The next 6 sustain more than 2.5 Mbps. Even those in positions 57 and 58 are well over 2 Mbps. But the two satellite firms, Viasat and Hughes are strong outliers at 1.56 and .98 respectively.

Tracking performance since January, 2014, paints an even worse picture. While most providers in a cross section of different technologies show gradual improvements, including for particularly slow services like AT&T DSL, the satellite firms show

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[1]
https://www.fcc.gov/reports-research/reports/measuring-broadband-america/measuring-fixed-broadband-report-2016.
[2]
https://qz.com/1093475/smart-home-market-share-amazon-echo-amzn-has-a-huge-lead-on-google-home-googl/.
[3] http://www.businessinsider.com/the-inside-story-of-how-amazon-created-echo-2016-4.

declining performance.

The FCC's own 2016 Measuring Broadband America Fixed Broadband Report[4] notes that satellite offers particularly poor service compared to other options:

> "The industry saw an approximate order of magnitude performance increase with the introduction of satellites operating in Ka-band frequencies beginning in late 2011. Performance from these satellites has declined as capacity limits are being reached."

> "The overwhelming majority of ISPs performed within 10% of last year's results. The exception for this was satellite ISPs. Hughes' actual vs. advertised speeds ratio went down from 203% to 152% while Viasat's went down from 107% to 71%. This is likely the result of increased subscribership and consumer usage of these services. "

> "In addition, one satellite company (ViaSat) had a significant decline in performance from previous years in this regard with performance significantly below that of advertised speed; suggesting, as noted, that capacity limits are being approached for its current satellite constellation."

If the Commission wants to revisit satellite after the data is available for the new satellites, it can do so. In the meantime, it is inappropriate to speculate that satellite services can offer a reasonable broadband connection under reasonable terms.

Satellite Industry Association claims, "Therefore, the issue is not measuring theoretical capacity, but how well a network is managed to minimize congestion and provide a high-quality experience to consumers. In contrast, networks that may be "capacity-rich" (including fiber-to-the-node) can experience significant congestion issues and 'bottlenecks' that can limit the speed and other consumer quality criteria."[5]

Satellite Industry Association should note that the Commission studies this and has found, "One of the key measures for ISP performance is the 80/80 speed consistency which is the speed that at least 80% of the subscribers experience at least 80% of the time over peak periods. Optimum, Charter, Time-Warner Cable and Verizon (FiOS) did well with values rising above 90% of the advertised speed. This ratio fell below 50% for AT&T (DSL), Frontier (fiber) and Viasat (satellite)."[6]We believe the FCC should well consider which technologies fail to deliver acceptable performance across the board and

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[4]

https://www.fcc.gov/reports-research/reports/measuring-broadband-america/measuring-fixed-broadband-report-2016.

[5] https://ecfsapi.fcc.gov/file/10920194233628/SIA%20706%20Final.pdf.

[6]

https://www.fcc.gov/reports-research/reports/measuring-broadband-america/measuring-fixed-broadband-report-2016.

cease consider them capable of delivering broadband.

In promoting their business to shareholders, one satellite firm candidly acknowledges it cannot compete with modern terrestrial broadband services:

> "We believe our ViaSat-2 and ViaSat-3 technologies will enable us to expand our total addressable market further by offering better services for more homes that, for a variety of reasons, are left behind by the most advanced terrestrial offerings."[7]

Satellite service is not comparable to terrestrial broadband technologies. It offers an important service for people that presently have no other option, but much like a life-raft is not a houseboat, satellite Internet service is not currently capable of providing advanced telecommunications service, much less any appropriate definition of broadband.

In our work with communities across the United States, we have encountered many subscribers to satellite service, largely because those are the people most motivated to seek better solutions for themselves and their communities. Left no other option, people can get by on ketchup sandwiches. But that is not a compelling reason to make it a nutritional standard for lunches. If the FCC wishes to classify satellite service as a fixed broadband service delivering broadband, it should at least consider that virtually no one with a terrestrial broadband option takes satellite services, and investigate widespread opinion from people who depend upon it

IV.   Mobile Internet Access Should Be Considered A Complement to Wireline Internet Access in Every Home, Rather Than A Substitute

a.   Mobile Providers and Their Lobbyists Incorrectly Argue Consumers Choose Mobile Over Wireline Connectivity Based on Steady Increases In Mobile Adoption

Numerous comments suggest that mobile broadband is or may become a substitute for fixed service. We continue to see very little evidence of that to date and believe the Commission should not be speculating about future substitution. Should that day arrive, the Commission can then adjust its approach.

The Government Accountability Office recently issued a report on Broadband, "Additional Stakeholder Input Could Inform FCC Actions to Promote Competition." It notes "According to experts and stakeholders we spoke to, fixed and mobile broadband services are not fully substitutable for one another, but may be in the future."[8] One of the experts that believed they were somewhat substitutable noted that even unlimited mobile

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[7]http://files.shareholder.com/downloads/VSAT/5244618488x0x950353/2D4619A2-A6CF-4E8E-9D18-B17 D2B0CA32A/Annual_Report_2017_Final_Full_Digital_071717.pdf.
[8] https://www.gao.gov/assets/690/687244.pdf, p.15.

broadband plans "do not offer the same level of video resolution available on fixed connections, making the service more appropriate for smaller mobile devices than larger televisions."[9] The report concludes "While most Americans have several choices for a mobile broadband provider, fixed and mobile service do not provide the same experience."[10]

Any argument that mobile broadband access is substitutable for fixed access must focus on "unlimited" plans because no ordinary household can use common applications when facing a monthly bandwidth cap in the single or low double digits. **When ILSR examined the prices for unlimited packages for a household of 4 among the major 4 carriers, we found only one carrier that would charge less than $150/month**. And that was Sprint if you signed up within the next 6 months, with prices expected to increase in March 2018. Even if the services were comparable, the prices are not.

On July 18, 2017, residents from southeast Ohio, western West Virginia, and northeast Kentucky came together in Marietta, Ohio, to tell FCC Commissioner Clyburn about their experiences with broadband.[11] A young woman approaching her senior year in high school, Lillah Gagne, testified about her experiences as someone lacking adequate Internet access.

> "But there were times I came to school empty handed because of the lack of internet access at my house. Teachers patiently accommodated me and I occasionally ran to the printer to print on paper. My mom and I share 5 gigs of data which renews every month. Recently we used all 5 gigs in 7 days."

She used the monthly allowance researching to prepare for her presentation at the event - visiting web sites to better understand the positions of her elected officials, voting record, and sources of campaign contributions. No streaming. **She spoke as someone who lacked adequate Internet access, not someone blessed with mobile broadband.** That is the actual experience of most of the people ILSR and Next Century Cities have worked with across the country. They recognize the many ways in which having mobile broadband access is insufficient.

When considering the opinions of others who testified that night of July 18, it is clear that people believe fixed, terrestrial broadband options are what they need. People tended not to distinguish between lack of broadband, having satellite services, or subscribing to mobile broadband services. They treated those three situations similarly, as lacking sufficient Internet access to participate in the modern economy and modern life.[12]

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[9] Ibid, pp. 16-17.
[10] Ibid, p. 26.
[11] http://ruralassembly.org/blog/2017/6/15/appalachian-ohio-west-virginia-connectivity-summit
[12] See http://www.mydailyregister.com/news/16779/telling-their-stories and https://www.facebook.com/WOUBPublicMedia/videos/10155449825037432/ and https://www.facebook.com/WOUBPublicMedia/videos/10155449548292432/.

b. Mobile Providers Recognize That the Services They Offer Are No Substitute For Wireline Connectivity

Several mobile providers and their trade organizations comment that one of the FCC's most grievous errors is the use of "arbitrary benchmarks" to define broadband and encourage the commission to adopt separate manners of measuring mobile and wireline services.[13] AT&T goes on to state:

> "Attempting to use a speed benchmark for mobile services would raise a host of unique methodological issues about how to measure download and upload speeds in the mobile context, where speeds are affected by various factors. The Commission could avoid those methodological difficulties altogether by simply choosing LTE as the appropriate standard for advanced telecommunications capability in mobile services."[14]

CTIA writes:

> "However, rigid benchmarks are not suitable for the Commission to determine whether mobile wireless broadband deployment is reasonable and timely. As the 2016 Report noted, 'mobile transmissions are subject to environmental factors that fixed line transmissions do not encounter' —indeed, mobile transmissions 'encounter degrading effects from factors such as congestion, interference, and challenges presented by the physical velocity of the mobile antenna.' As a result of these and other factors, it is difficult to set rigid benchmarks against which to judge mobile wireless broadband networks."

We believe AT&T, et al, are correct in admitting that mobile wireless has too many challenges and factors that can reduce quality of service to be treated similarly to fixed connections. To the extent the FCC plans to measure mobile access, it should be done separately from fixed access, the service that most Americans continue to depend upon for the majority of their Internet usage (including via mobile devices using Wi-Fi attached to fixed services). **Perhaps the market will treat mobile and fixed services as substitutable at such a point when mobile broadband providers are comfortable having their services benchmarked.**

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[13] See Comments of CTIA, p. 16-18,
https://ecfsapi.fcc.gov/file/10921260790433/170921%20CTIA%20Section%20706%20Comments.pdf,
see Comments of Verizon, p. 14.
https://ecfsapi.fcc.gov/file/10921261086205/2017%2009%2021%20Verizon%20706%20comments_final.pdf.
[14] See Comments of AT&T, p.8-9,
https://ecfsapi.fcc.gov/file/10922209229173/706%20Opening%20Comments%20for%202017%20Final.pdf

Refusing to benchmark services may be convenient for the mobile broadband companies, but it results in real world subscribers seeing vastly different performances and the Commission lacking an understanding of how services are perceived at the point of use.

We have concerns about the claim that LTE alone is sufficient, as we have seen connections in our phones that claim to be LTE without offering robust access. LTE towers may be significantly over-subscribed without adequate backhaul to provide the service subscribers expect from an LTE connection. To the extent the FCC is measuring mobile broadband usefully, it must reflect the actual desires and needs of those using the connections rather than a technical standard that may not reflect any quality of service.

V.   When Establishing Benchmarks, the Agency Must Consider the Future Needs of Americans to Ensure Wise Investment

The Free State Foundation argues that the Commission should not:

> …[A]lter its benchmarks to suit data-intensive services or applications that are only minimally available and minimally adopted, such as 4K ultra HD streaming video. The Commission's adoption of broadband speed benchmarks should be based on capabilities needed to support online services and applications that enjoy relatively wide everyday use by consumers. There should be a connection between the speed benchmarks adopted by the Commission and those services that enable services to which a "substantial majority" of consumers actually subscribe, as contemplated in the Notice."[15]

We agree that the Commission should adopt *minimum* benchmarks based on applications that "enjoy relatively wide everyday use by consumers." We also believe that the Commission must continue considering usage for a household and not an individual. But we object to the term 'consumer' as used here and in so many places by other commenters. The Commission would do well to remember that subscribers may consume in some capacity but are also producers in many way. They produce goods, physical and virtual. They produce ideas necessary for a democratic society. They produce images and videos that make life meaningful and they want to store them in the cloud to avoid losing them to a hardware failure or ransomware attack. The majority of bits transmitted over a month may be for watching video -- but that does not tell the Commission anything about what is valuable to the subscriber. ILSR's Community Broadband Director, Christopher Mitchell, streams a lot of video from Hulu and Netflix, but being able to videochat with his son when he is out of state just a few times per month is infinitely more valuable.

In any event, the standard advanced by the Free State surely rules out the inclusion of satellite Internet services as an acceptable fixed service because the nature of modern

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[15] See Comments of the Free State Foundation, p. 8, https://ecfsapi.fcc.gov/file/1092136091140/FSF%20Comments%20in%20Section%20706%20Inquiry%20-%20Final%20-%20092117.pdf

commonly-used applications are simply inaccessible to satellite subscribers facing a multitude of data caps and latency limitations.

Similarly, as noted by Lillah Gagne and multiple others at the Marietta broadband hearing, modern mobile Internet access simply does not allow a modern household to take full advantage of modern Internet applications.

VI. Local Communities' Ability to Control Their Rights-of-Way Should Not be Infringed

As noted in our initial comments, we believe the Commission should investigate the challenges to local investment. Multiple commenters made generalized claims that local permitting processes and other local government management of the rights-of-way have impeded access but offered scant details. Before the Commission can make a finding regarding those allegations, it must investigate specific claims with an opportunity for both sides to present evidence. The challenges of managing rights-of-way requires balancing public safety and permit fees (among other considerations) against the needs of service providers and subscribers to ensure all providers are able to invest and provide the services demanded by the public.

Before permit fees, permit processes, and public safety concerns can be overruled by a state or the Commission, relevant bodies should ensure that such actions are not causing the public to subsidize some wireless or related businesses either intentionally or inadvertently by such actions.

Far too many discussions in this delicate policy area are accompanied by generalized claims without specific facts. Given the many political jurisdictions and varied approaches from different firms seeking right-of-way access, the FCC must engage in much more fact-finding than this proceeding has generated to make any conclusions about how right-of-way management impacts the deployment of these services.

In our experience, the challenges of pole access and make-ready are significantly more burdensome and disruptive to investment plans than right-of-way management in most communities.

VII. Conclusion

When examining the timely and reasonable deployment of advanced telecommunications to all Americans, the FCC should consider the above issues.
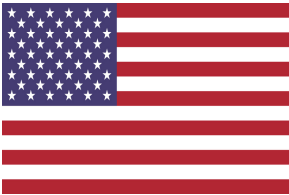

Respectfully submitted,

Institute for Local Self-Reliance
Next Century Cities

APPENDIX A

NETFLIX SPEED INDEX
(TABLE)

UNITED STATES

The Netflix ISP Speed Index is a measure of **prime time Netflix performance on particular ISPs** (internet service providers) around the globe, and not a measure of overall performance for other services/data that may travel across the specific ISP network.

ISP LEADERBOARD - AUGUST 2017

HIDE SMALLER ISPS (?)

RANK	ISP	SPEED Mbps		PREVIOUS Mbps	RANK CHANGE	TYPE Fiber Cable DSL Satellite Wireless
1	Google Fiber	4.05		3.86		Fiber
2	**Comcast**	**3.99**		**4.05**		**Cable**
3	WOW!	3.98		4.00		Cable
4	Grande Communications	3.97		3.99		Fiber
5	Metronet	3.91		3.94		Fiber
6	CDE Lightband	3.90		3.89		Fiber
7	Midco	3.90		3.94		Cable
8	**Verizon - FiOS**	**3.89**		**3.93**		**Fiber**
9	EPB	3.89		3.88		Fiber
10	**Optimum**	**3.86**		**3.89**		**Cable**

11	**Spectrum**	**3.85**		**3.87**	Cable
12	Comporium Fiber/Cable	3.84		3.85	Fiber Cable
13	RCN	3.83		3.83	Cable
14	Wave	3.82		3.84	Cable
15	**Cox**	**3.81**		**3.87**	Cable
16	**Mediacom**	**3.77**		**3.79**	Cable
17	**AT&T - U-verse**	**3.77**		**3.73**	Fiber
18	GVTC	3.77		3.79	Fiber Cable DSL
19	Atlantic Broadband	3.74		3.79	Cable
20	MetroCast	3.74		3.74	Cable
21	Fidelity Communications	3.71		3.71	Cable
22	**Suddenlink**	**3.70**		**3.72**	Cable
23	PenTeleData	3.67		3.70	Cable
24	Cablelynx	3.67		3.70	Cable
25	NewWave Communications	3.65		3.74	Cable
26	Liberty Puerto Rico	3.62		3.68	Cable
27	Vyve Broadband	3.62		3.57	Cable
28	Antietam Cable	3.61		3.66	Cable
29	Vivint	3.60		3.66	Wireless

NETFLIX (/)

30	Northland	3.60		3.59	Cable
31	HTC	3.60		3.58	Cable DSL
32	MCTV	3.58		3.61	Cable
33	Buckeye	3.57		3.60	Cable
34	Cincinnati Bell	3.55		3.57	DSL
35	Veracity	3.54		3.67	Fiber DSL
36	North State	3.53		3.56	Fiber
37	Comporium DSL	3.48		3.38	DSL
38	Cable One	3.46		3.49	Cable
39	Consolidated	3.40		3.45	Fiber DSL
40	BendBroadband	3.38		3.42	Cable
41	Hawaiian Telcom	3.37		3.41	Fiber DSL
42	Armstrong	3.36		3.38	Cable
43	TDS	3.25		3.27	DSL
44	Lumos	3.25		3.23	DSL
45	**Frontier**	**3.18**		**3.21**	**Fiber** **DSL**
46	**CenturyLink**	**3.15**		**3.16**	**DSL**
47	GCI	3.11		3.13	Cable
48	Sonic	3.08		3.07	DSL

49	Shentel	3.07		3.06		Fiber Cable DSL
50	**Verizon - DSL**	**3.00**		**2.89**	**+2**	DSL
51	**Windstream**	**2.97**		**2.94**		DSL
52	**AT&T - DSL**	**2.93**		**3.02**	**-2**	DSL
53	Alaska Communications	2.89		2.89		DSL
54	Bluebird Network	2.81		2.75		DSL Wireless
55	Hargray	2.81		2.49		Fiber Cable DSL
56	Fairpoint	2.55		2.55		DSL
57	Claro Puerto Rico	2.39		2.37		DSL
58	Rise Broadband	2.26		2.26		Wireless
59	Viasat	1.56		1.50		Satellite
60	Hughes	0.98		1.20		Satellite

CSV DOWNLOAD ⬇   **JPG DOWNLOAD** ⬇

ISP DATA

VIEW BY	▾

16 ITEMS SELECTED	▾
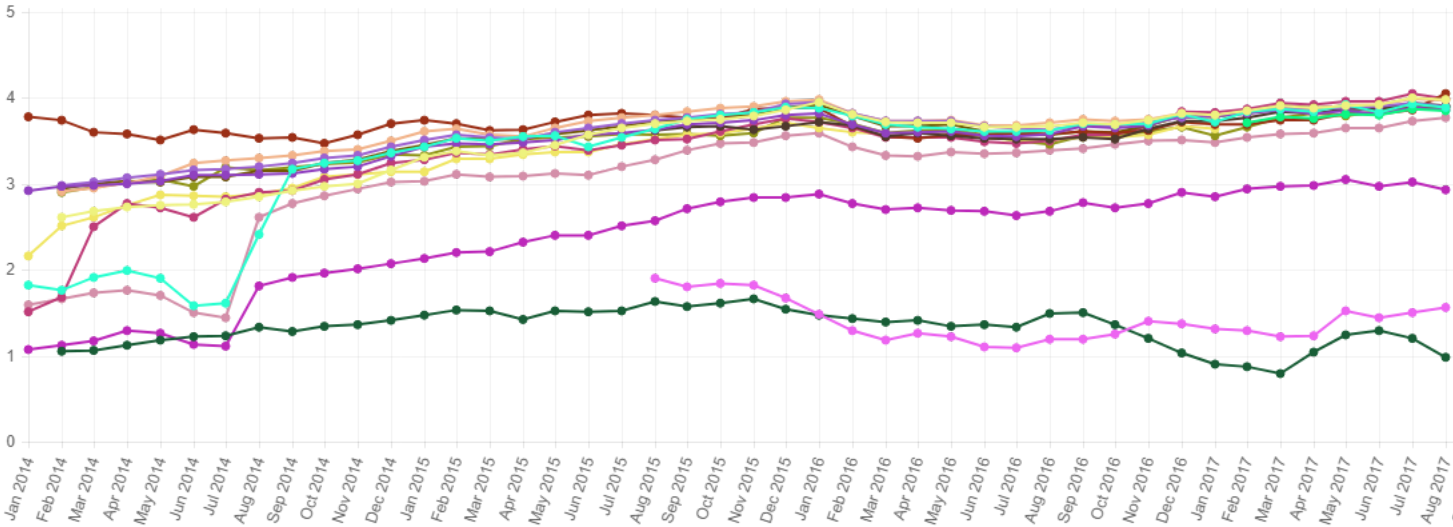
2014-01	📅

2017-10	📅

Alaska Communications

Antietam Cable

Armstrong

Atlantic Broadband

AT&T - DSL

AT&T - U-verse

BendBroadband

Bluebird Network

Bright House ❶

Buckeye

Cablelynx

Cable One

CDE Lightband

CenturyLink

Charter ❶

Cincinnati Bell

Claro Puerto Rico

Comcast

Comporium DSL

Comporium Fiber/Cable

APPENDIX B

NETFLIX SPEED INDEX
(IMAGE)

UNITED STATES

RANK	ISP	SPEED Mbps		PREVIOUS Mbps	RANK CHANGE	TYPE
1	Google Fiber	4.05		3.86		Fiber
2	Comcast	3.99		4.05		Cable
3	WOW!	3.98		4.00		Cable
4	Grande Communications	3.97		3.99		Fiber
5	Metronet	3.91		3.94		Fiber
6	CDE Lightband	3.90		3.89		Fiber
7	Midco	3.90		3.94		Cable
8	Verizon - FiOS	3.89		3.93		Fiber
9	EPB	3.89		3.86		Fiber
10	Optimum	3.86		3.89		Cable
11	Spectrum	3.85		3.87		Cable
12	Comporium Fiber/Cable	3.84		3.85		Fiber, Cable
13	RCN	3.83		3.83		Cable
14	Wave	3.82		3.84		Cable
15	Cox	3.81		3.87		Cable
16	Mediacom	3.77		3.79		Cable
17	AT&T - U-verse	3.77		3.73		Fiber
18	GVTC	3.77		3.79		Fiber, Cable, DSL
19	Atlantic Broadband	3.74		3.79		Cable
20	MetroCast	3.74		3.74		Cable
21	Fidelity Communications	3.71		3.71		Cable
22	Suddenlink	3.70		3.72		Cable
23	PenTeleData	3.67		3.70		Cable
24	Cablelynx	3.67		3.70		Cable
25	NewWave Communications	3.65		3.74		Cable
26	Liberty Puerto Rico	3.62		3.68		Cable
27	Vyve Broadband	3.62		3.57		Cable
28	Antietam Cable	3.61		3.66		Cable
29	Vivint	3.60		3.66		Wireless
30	Northland	3.60		3.59		Cable
31	HTC	3.60		3.58		Cable, DSL
32	MCTV	3.58		3.61		Cable
33	Buckeye	3.57		3.60		Cable
34	Cincinnati Bell	3.55		3.57		DSL
35	Veracity	3.54		3.67		Fiber, DSL
36	North State	3.53		3.56		Fiber
37	Comporium DSL	3.48		3.38		DSL
38	Cable One	3.46		3.49		Cable
39	Consolidated	3.40		3.45		Fiber, DSL
40	BendBroadband	3.38		3.42		Cable
41	Hawaiian Telcom	3.37		3.41		Fiber, Cable
42	Armstrong	3.36		3.38		Cable
43	TDS	3.25		3.27		DSL
44	Lumos	3.25		3.23		DSL
45	Frontier	3.18		3.21		Fiber
46	CenturyLink	3.15		3.16		DSL
47	GCI	3.11		3.13		Cable
48	Sonic	3.08		3.07		DSL
49	Shentel	3.07		3.06		Fiber, Cable, DSL
50	Verizon - DSL	3.00		2.89	+2	DSL
51	Windstream	2.97		2.94		DSL
52	AT&T - DSL	2.93		3.02	-2	DSL
53	Alaska Communications	2.89		2.89		DSL
54	Bluebird Network	2.81		2.75		DSL, Wireless
55	Hargray	2.81		2.49		Fiber, Cable, DSL
56	Fairpoint	2.55		2.55		DSL
57	Claro Puerto Rico	2.39		2.37		DSL
58	Rise Broadband	2.26		2.26		Wireless
59	Viasat	1.56		1.50		Satellite
60	Hughes	0.98		1.20		Satellite

Fiber   Cable   DSL   Satellite   Wireless