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July 24, 2019

Via ECFS

Marlene Dortch, Secretary
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Re: *Ex Parte* Filing of ACA Connects – America’s Communications Association in WC Docket Nos. 19-126 and 10-90, Rural Digital Opportunity Fund and Connect America Fund; WC Docket Nos. 19-195 and 11-10, Establishing the Digital Opportunity Data Collection and Modernizing the FCC Form 477 Data Program

Dear Ms. Dortch:

On July 22, 2019, Ross Lieberman and Brian Hurley (“ACA Connects”) and Thomas Cohen (Kelley Drye & Warren LLP and Counsel to ACA Connects) (collectively, the “ACA Connects Representatives”) met with the following staff of the Federal Communications Commission (“Commission”) to discuss the above-referenced dockets and the draft decisions the Commission released on July 11, 2019:¹ Preston Wise, Special Counsel to Chairman Pai; Travis Litman, Chief of Staff and Senior Legal Advisor, Wireline and Public Safety, Commissioner Rosenworcel; Arielle Roth, Wireline Legal Advisor, Commissioner O’Rielly; and Randy Clarke, Acting Legal Advisor for Wireline and Public Safety, Commissioner Starks.

During the meetings, the ACA Connects Representatives made the following points about each of the draft decisions.

¹ *Rural Digital Opportunity Fund*, WC Docket No. 19-126, *Connect America Fund*, WC Docket No. 10-90, Notice of Proposed Rulemaking (draft rel. July 11, 2019) (“*RDOF NPRM*”); *Establishing the Digital Opportunity Data Collection*, WC Docket No. 19-195, *Modernizing the FCC Form 477 Data Program*, WC Docket No. 11-10, Report and Order and Second Further Notice of Proposed Rulemaking (draft rel. July 11, 2019) (“*Broadband Mapping Order/NPRM*”).

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Rural Digital Opportunity Fund

ACA Connects supports prompt adoption and implementation of the Rural Digital Opportunity Fund (“RDOF”). Last year’s Connect America Fund Phase II reverse auction was a success, demonstrating that the Commission can deliver more robust broadband service to unserved locations far more cost-effectively through an auction than by relying on the Connect America Cost Model.² The RDOF, if properly structured and implemented, has the potential to build on this success. Further, by promptly adopting and implementing the RDOF, the Commission would further ensure the integrity of the high-cost fund by transitioning from the inefficient cost-model program to one that uses a reverse action to award support.³

² See Statement of Chairman Ajit Pai, Federal Communications Commission, Hearing on “Oversight of the Federal Communications Commission,” Before the United States Senate Committee on Commerce, Science, and Transportation” (June 12, 2019), available at <https://www.fcc.gov/document/chairman-pais-testimony-senate-commerce-committee>; see also Connect America Fund Phase II Auction Results, Rural Broadband Auctions Task Force, Federal Communications Commission, Open Meeting (Sep. 26, 2018), available at <https://www.fcc.gov/document/fcc-staff-presentation-connect-america-fund-auction-results>; Joseph Gillan, Gillan Associates, “Lessons from the CAF II Auction and the Implications for Rural Broadband Deployment and the IP Transition,” NRRI Insights, at 2 (Apr. 2019), available at http://nrri.org/wp-content/uploads/sites/13/2019/04/Final-NRRI-Insights_Gillan_4-12-2019.pdf (“The two defining metrics that measure the success of the CAF II Auction are: (1) the total support awarded by the auction (\$1.48.8 million/year) is 70% less than the amount the Connect America Cost Model (“CAM”) estimated would be needed, and (2) the number of unserved locations in the territories of price cap ILECs will decline by almost 75% once the CAF Auction winners begin offering service.”) (emphasis in original) (“Gillan Auction Paper”).

³ In the meetings, the ACA Connects Representatives were asked to comment on USTelecom’s proposal to limit Phase I of the program to only completely unserved census block groups and postpone Phase II until the FCC adopts and implements a Broadband Mapping Initiative consistent with what USTelecom and others have proposed. USTelecom’s proposal does not speak to whether price cap carriers receiving cost-model support would continue to do so during the interim between the two auctions. See Letter from Mike Saperstein, Vice President, Policy & Advocacy, USTelecom, to Ms. Marlene Dortch, Secretary, Federal Communications Commission, WC Docket Nos. 19-195 19-126, 11-10, 10-90 (July 19, 2019). The ACA Connects Representatives explained the Commission should reject the proposal for the following reasons. First, because the Phase II cost-model program is demonstrably not cost-effective, there is no justification to extend it and waste limited universal service funding. Second, the Phase II cost-model broadband performance requirements fall far short of what was obtained via the Phase II reverse auction process. Third, USTelecom offers no support for its contention that “auctioning all unserved locations together allows for substantially more efficient bidding through a potentially larger-scale network design.” *Id.* at 2. In fact, as

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At the same time, ACA Connects explained that the Phase II auction rules deterred participation by, among others, many smaller cable operators and rural telephone providers, which reduced the cost-effectiveness of the program. ACA Connects submitted that two key improvements would address shortcomings in the rules that limited participation:⁴

First, the Commission should adopt as the minimum geographic unit of bidding an eligible census block and not some larger geographic area. This will enable bidders to select only those areas where it is economically feasible to deploy and use packing bidding to achieve any network efficiencies. At the very least, in the *RDOF NPRM*, the Commission should seek comment on the benefits and costs of using an eligible census block as the minimum geographic unit of bidding, and it should require similar evidence to justify using a larger geographic area.

noted in the *Gillan Auction Paper*, size does not appear to be a critical factor in rural broadband deployments. *See Gillan Auction Paper* at 5 (“One of the key lessons from the CAF II Auction is that ‘*local*’ is more important than *large*.’ Although price cap companies are large..., that size does not appear to necessarily provide a meaningful advantage when deploying broadband service in rural markets. Indeed, of the 182 winner/state combinations, nearly 25% of the bids/state were for 200 locations or less in *that* state, with the individual bids tailored even more precisely.”) (emphasis in original). In addition, because price cap carriers were at best minor participants in the CAF Phase II auction, the Commission should be careful about relying on their contention regarding bidding efficiencies in auctions for fixed universal service support. *See* Carol Matthey, Matthey Consulting LLC, “Reaction to Joe Gillan’s Paper, ‘Lessons from the CAF II Auction and the Implications for Rural Broadband Deployment and the IP Transition,’” NRRI Insights, at 10 (Apr. 2019), available at http://nrri.org/wp-content/uploads/sites/13/2019/04/Final-NRRI-Insights_Gillan_4-12-2019.pdf (“It is notable that the incumbent price cap carriers were not major players in the CAF Phase II auction....CenturyLink did not apply to participate in the auction at all. AT&T submitted a short form application and was qualified to bid, but ultimately did not bid. Frontier and Windstream bid, but only on a small number of locations....Verizon...initially placed bids on less than 60,000 locations...[and] was the winning bidder for less than 3,500 locations.”). Fourth, there is no indication that the Commission will adopt USTelecom’s Broadband Mapping Initiative, or do so any time soon. Further, even with the Broadband Mapping Initiative, the Commission would still have to undertake a challenge process – which it can do now – to ensure it accurately identifies eligible unserved areas.

⁴ The ACA Connects Representatives discussed these improvements in a meeting with Commission staff in June. *See* Letter from Thomas Cohen, Counsel for ACA Connects, to Marlene H. Dortch, Secretary, Federal Communications Commission, WC Docket No. 19-126 (June 14, 2019).

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ACA Connects recommends that the Commission add at the end of paragraph 21 of the *RDOF NPRM* the following: *“Also, we have heard that using an eligible census block as the minimum geographic unit of bidding would increase participation in the auction, driving more cost-effective results, and we seek comment on whether to use this smaller geographic area proposal. In offering comment on any proposal, we encourage commenters to provide evidence, especially benefit/cost analysis, to support their preferences.”*

Second, to further maximize participation, the Commission should alter the weighting methodology to ensure it is more technology-neutral, which would encourage providers to bid for all performance tiers knowing they had a reasonable opportunity to prevail in the auction.⁵ ACA Connects submitted that the Commission can accomplish this aim by providing for a significantly greater discount for the Baseline performance tier – and not the minor additional discount of five percent proposed in the *RDOF NPRM*. The Commission’s proposal seeks to maintain the “90-point spread between the best and least performing tiers,”⁶ but nowhere in the *RDOF NPRM* is there any indication this change will make the process more technology-neutral nor is there any support for how it will maximize participation.

ACA Connects therefore recommends the *RDOF NPRM* include the following language at the end of paragraph 25: *“We also seek comment on whether to increase the discount of the Baseline performance tier beyond the amount proposed above. Commenters should provide evidence, including benefit/cost analysis, to support their proposals.”*

In addition to these changes to maximize participation in the auction,⁷ the ACA Connects Representatives indicated they understand the *RDOF NPRM* seeking comment on amending the lower bound of its longstanding high-cost threshold to ensure locations in these “lower-cost”

⁵ ACA Connects explained its rationale and analysis at length in an *ex parte* filed while the Commission was considering rules for the Phase II program. See Letter from Thomas Cohen, Counsel for the American Cable Association, to Marlene H. Dortch, Secretary, Federal Communications Commission, WC Docket No. 10-90 (Feb. 17, 2017). This filing is attached.

⁶ See *RDOF NPRM*, para. 25.

⁷ The ACA Connects Representatives further recommended that the Baseline broadband performance standard should be increased to 100/10 Mbps with low latency, which would reflect current market reality, where, for instance, recent speed test data from Ookla show that, last year, fixed broadband speeds were 96.25/32.88 Mbps in the U.S. See “Fixed Broadband Speedtest Data, Q2-Q3 2018 United States,” Ookla, available at <https://www.speedtest.net/reports/united-states/2018/#fixed> (Dec. 12, 2018). ACA Connects also recommended that the Commission increase the performance requirement in year 4 and year 8 to ensure service is “reasonably comparable.”

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areas have sufficient broadband service.⁸ The Commission expected incumbent providers to have upgraded their networks to provide such service in these areas, but they failed to do so. The ACA Connects Representatives recommended the Commission consider including these areas, to the extent they are still unserved, in Phase II of the RDOF. This will provide an opportunity for the many measures the Commission⁹ and Congress¹⁰ have adopted over the past two years to lower the cost of deployment to be used in the field and drive incumbent and other providers to build in these areas. In addition, other federal and state broadband programs may provide support to providers to address at least part of this concern. At the very least, the *RDOF NPRM* should inquire about such developments before adopting any policy.

Accordingly, ACA Connects proposes that paragraph 51 of the *RDOF NPRM* be amended by adding at the end: “*We also seek comment on whether to postpone inclusion of these census blocks until Phase II of the RDOF so that the Commission can observe whether reforms adopted by it and other government entities that would encourage broadband deployment have resulted in sufficient broadband service being deployed in these areas.*”

Digital Opportunity Data Collection

The ACA Connects Representatives explained they generally support the *Broadband Mapping Order/NPRM*’s requirement that fixed broadband providers submit broadband coverage polygons of areas where they have networks and make service available.¹¹ This approach should ensure the Commission receives more accurate and granular broadband deployment data. At the same time, the Commission should ensure this approach is not overly burdensome for smaller providers. The *Broadband Mapping Order/NPRM* directs the Office of Economic Analysis (“OEA”), Wireline Competition Bureau (“WCB”), International Bureau (“IB”), and the

⁸ See *RDOF NPRM*, para. 51.

⁹ See, e.g., *Accelerating Wireline Broadband Deployment by Removing Barriers to Infrastructure Investment, et al.*, WC Docket No. 17-84, *et al.*, Third Report and Order and Declaratory Ruling, 33 FCC Rcd 7705 (2018) (including reforms to facilitate attachments to “utility” poles); *Accelerating Wireless Broadband Deployment by Removing Barriers to Infrastructure Investment, et al.*, WC Docket No. 17-79, *et al.*, Declaratory Ruling and Third Report and Order, 33 FCC Rcd. 9088 (2018) (interpreting Section 253 of the Communications Act, as amended, to facilitate access to public rights-of-way).

¹⁰ See, e.g., Tax Cuts and Jobs Act of 2017, Pub. L. 115-97, 131 Stat. 2054 (2017) (providing for accelerated depreciation for new capital investments); Consolidated Appropriations Act, 2018, Pub. L. 115-141, 132 Stat. 399, Division A, § 779 (2018) (providing \$600 million for a new broadband loan and grant pilot program).

¹¹ See *Broadband Mapping Order/NPRM*, para. 12.

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Universal Service Administrative Company to implement this aspect of the order, including by “defining the GIS compatible file format(s) in which fixed providers will be required to submit their polygons.”¹² The ACA Connects Representatives explained that certain file formats, such as ESRI, are proprietary and would be unduly costly for smaller providers to use. In contrast, the KMZ file format, which can be derived from Google Earth, is free and is relatively easy to use. ACA Connects understands the desire of the Commission to have providers file in a common format, but this should not be achieved by imposing unreasonable burdens on smaller providers.

ACA Connects therefore recommends the draft *Broadband Mapping Order/NPRM* be amended as follows: Footnote 26 – “As noted, we direct OEA to *consider all file formats, including the KMZ file format, and* set the GIS file formats and data types that it ultimately determines *is* are most advantageous for broadband reporting, *while accounting for the potential burdens on smaller fixed providers.*”

In addition, the ACA Connects Representatives explained that the new collection regime has the potential to burden not just the very smallest providers (those with fewer than 250 subscribers), but somewhat larger providers that also do not have personnel that could be dedicated to the task of collecting (or overseeing the collection of) and producing the new information. ACA Connects therefore proposed increasing the “small provider threshold” from 250 to 1,500 subscribers and directing the Commission staff to consider additional ways to help these smaller providers comply with the new requirements.

ACA Connects therefore recommends the draft *Broadband Mapping Order/NPRM* be amended as follows: Paragraph 17 – “[W]e require all fixed providers to make the required Digital Opportunity Data Collection filings, although we direct WCB, in coordination with OEA and IB, to determine whether any category of very small fixed providers (e.g., those with less than ~~250~~ 1,500 subscribers and who are not eligible telecommunications carriers (ETCs) under the USF program) should have additional time in filing their initial reports *and should receive assistance from WCB in filing their reports.*”

The ACA Connects Representatives also indicated they support the *Broadband Mapping Order/NPRM*’s use of crowdsourcing to improve the accuracy of broadband deployment data.¹³ However, again, the Commission should balance this approach with the burdens that may be placed on smaller providers. For example, the ACA Connects Representatives explained that it would be onerous if a smaller provider had to respond immediately to each and every submission from an individual or government entity without any determination whether these filings indicate a valid and sufficient concern with the provider’s data that may, for instance, determine how

¹² See *id.*, para. 15.

¹³ See *id.*, para. 18.

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universal service funding is awarded.¹⁴ Rather, unless there is a critical mass of submissions that the Commission determines is sufficient to indicate a material and immediate concern, which requires immediate resolution to prevent harm, a smaller provider should be able to account for this additional information the next time it updates its filing. Further, the Commission should not sanction a provider for submitting inaccurate data unless there is clear evidence the provider intentionally and persistently did so. ACA Connects appreciates these and other issues related to crowdsourced information are raised sufficiently in the notice of proposed rulemaking section of the draft, and we do not seek any additions or amendments.¹⁵

The ACA Connects Representatives additionally indicated that they appreciate that the draft *Broadband Mapping Order/NPRM* does not require providers to submit location-based information at this time, especially due to the costs it would impose on smaller providers.¹⁶ They also indicated that, should the Commission adopt such an approach in the future, it should provide a sufficient transition for smaller providers, and it should refrain from requiring providers that do not accept federal universal service support to publicly disclose individual location information since such information is considered to be competitively-sensitive. ACA Connects notes the draft's notice of proposed rulemaking raises these and a great many other issues about the collection of location-based information,¹⁷ and it will supply further comments on these issues in response to the notice.

¹⁴ In addition, the Commission should determine whether the filing is based on an accepted, industry-standard broadband coverage and performance measurement methodology.

¹⁵ See *id.*, paras. 91-96.

¹⁶ See *id.*, paras. 30-31.

¹⁷ See *id.*, paras. 97-108.

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This letter is being filed electronically pursuant to Section 1.1206 of the Commission's rules.¹⁸

Sincerely,



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202-342-8518
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Counsel for ACA Connects

Attachment: Letter from Thomas Cohen, Counsel for the American Cable Association, to Marlene H. Dortch, Secretary, Federal Communications Commission, WC Docket No. 10-90 (Feb. 17, 2017)

cc: Preston Wise
Travis Litman
Arielle Roth
Randy Clarke

¹⁸ 47 C.F.R. § 1.1206.

ATTACHMENT

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February 17, 2017

Via ECFS

Marlene H. Dortch, Secretary
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Re: *Ex Parte* Filing of the American Cable Association on the Connect America Fund, WC Docket No. 10-90

Dear Ms. Dortch:

On February 16, 2017, Ross Lieberman, Senior Vice President of Government Affairs, American Cable Association (“ACA”), Micah Sachs and Anne Gillard, Cartesian (by telephone), and Thomas Cohen, Kelley Drye & Warren LLP, Counsel to ACA, met with Jay Schwarz, Wireline Advisor to Chairman Pai, and Lisa Hone, Ryan Palmer, Alexander Minard, Heidi Lankau, and Katie King of the Wireline Competition Bureau. The purpose of the meeting was to discuss the analysis ACA undertook to develop a methodology to weight bids in the Connect America Fund (“CAF”) Phase II competitive bidding process (or auction)¹ that, by being technology neutral, would ensure significant and proportional auction participation by all providers.² By enabling maximum participation, bidding would be most competitive, and funding would be distributed most cost-efficiently, providing the public with the greatest return.

¹ *Connect America Fund et al.*, WC Docket No. 10-90 et al., Report and Order and Further Notice of Proposed Rulemaking, FCC 16-64, ¶¶ 205-229 (rel. May 26, 2016) (“CAF Phase II Auction Order”). *See also id.*, ¶¶ 14-18.

² ACA’s proposed weighting methodology is contained in a January 30, 2017 ex parte filing. *See* Letter from Thomas Cohen, Counsel to American Cable Association, to Ms. Marlene H. Dortch, Secretary, Federal Communications Commission, WC Docket No. 10-90 (Jan. 30, 2017).

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ACA representatives explained that its analysis examines the clustering of weighted cost-effectiveness ratios for all bids – winning and losing – across all eligible areas, assuming participants bid their cost to serve.³ Its analysis also leverages a comprehensive data set, and its data set and analysis account for the huge variability in costs of deployment due to housing density. In contrast, the analysis and data used in submissions by other interested parties are severely flawed because they assume a single cost benchmark for each technology⁴ – or worse, rely on hypothetical bid numbers.⁵

Applying ACA’s analysis and data to the various proposed methodologies, it is readily apparent, by examining the clustering of cost-based bids, that the weighting methodology proposed by US Telecom and the “draft” Commission methodology will not maximize participation by all potential providers using all technologies; instead they unduly favor one or a limited number of technologies and certain census blocks. The Rural Coalition’s methodology fares somewhat better, but it too will not drive the most cost-effective outcome. On the other hand, ACA’s proposed weighting methodology will produce the tightest clustering of bids, ensuring that the funding is allocated most cost-effectively. Moreover, if all participants simply bid at their cost to serve, ACA’s weighting methodology also would lead to full coverage of

³ The Commission’s system for prioritizing bids operates by ranking bids for all eligible areas, prioritizing those with highest weighted cost-effectiveness ratios. *See* CAF Phase II Auction Order, ¶ 210.

To ensure maximum auction participation, a weighting methodology should account for the fact that bidders may compete for funds against other bidders in their bid areas and may compete for funds against bidders in other areas. It also should take into account that providers will only participate if they believe they have a reasonable chance of winning. Thus, a successful weighting methodology should produce the tightest spread of weighted cost-effectiveness ratios across all technologies and geographies.

⁴ The US Telecom submission, which cites to data submitted by Southern Tier Wireless, is an example of an analysis utilizing single cost benchmarks without accounting for housing density. *See* Letter from Jonathan Banks, on behalf of US Telecom, to Ms. Marlene H. Dortch, Secretary, Federal Communications Commission, WC Docket No. 10-90 (February 10, 2017) (“US Telecom Ex Parte”); Letter from Geoffrey G. Why, on behalf of Southern Tier Wireless, to Marlene H. Dortch, Secretary, Federal Communications Commission, WC Docket Nos. 10-90, 14-58 and 14-259 (Sept. 21, 2016).

⁵ *See* Letter from Stephen E. Coran, Counsel to the Wireless Internet Service Providers Association, to Marlene H. Dortch, Secretary, Federal Communications Commission, WC Docket No. 10-90, 14-58 and 14-259 (Jan. 31, 2017).

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eligible census blocks without exhausting the full amount of support available – approximately \$2 billion (with support for New York removed).⁶

In the following section, ACA first sets forth its analytical framework in detail and then applies that framework to each of the proposed weighting methodologies.

ACA's Analytical Framework

To establish the fact base for its analysis, ACA's external consulting firm Cartesian modeled the cost to serve for the technologies that can serve each performance tier:⁷ fiber-to-the-home ("FTTH") for Gigabit and Above-Baseline,⁸ brownfield DSL for Baseline and Minimum,⁹ fixed wireless for Baseline, and satellite for Minimum with High Latency and Baseline with High Latency.¹⁰

⁶ See *Connect America Fund et al.*, WC Docket No. 10-90 *et al.*, Order, FCC 17-2 (rel. Jan. 26, 2017) ("CAF New York Order").

⁷ Comprehensive documentation of the data points used and modeling can be found in Appendix I.

⁸ Both Gigabit and Above Baseline could be provided by either FTTH or DOCSIS running over hybrid-fiber coax ("HFC") plant. However, for greenfield builds, the cost of build-out for either FTTH or HFC is effectively equivalent because the great majority of new plant build-out costs come from labor to deploy fiber rather than equipment. Indeed, service providers who traditionally offer broadband over HFC often build out FTTH when building in totally new areas. See *Ex Parte* Filing by 40 Smaller Cable Operators, to Ms. Marlene H. Dortch, Secretary, Federal Communications Commission, WC Docket No. 10-90 (Feb. 16, 2017). Therefore, ACA assumes that almost all Gigabit or Above Baseline bids will be submitted by providers planning to build using FTTH technology. ACA therefore also assumes that Above Baseline will rarely have a cost advantage over Gigabit.

⁹ ACA assumes that no operator will build a greenfield DSL network, as the build-out cost is similar to a greenfield FTTH network, which can provide far greater performance at a lower operating cost. Given the widespread availability of DSL technology even in rural areas, ACA assumes that many bids for Baseline and Minimum will be based on brownfield DSL, leveraging existing copper lines, cabinets, DSLAMs and other equipment. For higher speed DSL (Baseline tier), ACA assumes providers will need to push fiber closer to the network edge.

¹⁰ ACA disputes that satellite can serve Baseline with High Latency, as no US satellite broadband provider currently publicly offers 25/3 Mbps with a data cap of at least 150 GB. See <https://www.hughesnet.com/get-started>, <http://www.exede.com/plan-results/liberty12/>, and <https://www.infinitydish.com/dishnet>. However, ACA has

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Cartesian then applied the four proposed weighting methodologies – US Telecom, Rural Coalition, “draft” Commission, and ACA – to each technology in each eligible census block to determine the weighted cost-effectiveness ratio for all potential bids, assuming auction participants bid at their modeled cost to serve. The weighted cost-effectiveness ratios of all potential bids for each census block were then ranked from lowest to highest to determine the order of priority for awarding support.¹¹

Proposed Weighting Methodologies

Performance Tier	USTA	Rural Coalition	Draft FCC	ACA
Gigabit	0%	0%	0%	0%
Above Baseline	5%	30%	20%	15%
Baseline	15%	60%	40%	75%
Minimum	25%	70%	60%	80%
Higher Latency (regardless of speed)	25%	25%	25%	15%

included satellite at the Baseline tier with high latency due to the letter from Hughes implying they will bid at that level. *See* Letter from Jennifer A. Manner, Counsel to Hughes, to Ms. Marlene H. Dortch, Secretary, Federal Communications Commission, WC Docket No. 10-90 (February 14, 2017) (“Hughes Ex Parte”).

¹¹ Weighted cost-effectiveness ratios are not simply the (bid price) / (reserve price). They are by definition weighted using the weighting penalties associated with each tier proposed by the various weighting methodologies. So they are calculated in the following way: ((bid price) + (performance tier weighting) * (reserve price)) / (reserve price). US Telecom and the Rural Coalition follow the same approach. *See US Telecom Ex Parte*. *See also* Letter from Rebekah Goodheart to Marlene H. Dortch, Secretary, Federal Communications Commission, WC Docket No. 10-90 (Feb. 14, 2017) (reporting on *ex parte* meetings by Rural Coalition members).

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To determine the level of clustering, Cartesian analyzed the distribution of all cost-based bids across all geographies, under the presumption that providers will only participate if they believe they have a reasonable chance of winning against other likely bidders. The more tightly bids are clustered, particularly those between the 10th and 90th percentile of all bids, the more likely that the vast majority of providers will believe they have a reasonable chance to win.¹² Additionally, to provide another means of measuring clustering, Cartesian plotted the weighted cost-effectiveness ratio of the highest winning bid¹³ for each methodology to determine how far the weighted cost-effectiveness ratio of a bid at the 90th percentile is from the ratio for the highest winning bid. Finally, Cartesian evaluated for each methodology where each technology fell across the range of cost-based bids. This analysis allows one to forecast which technologies are more or less likely to be used by bidders under each methodology, and among those technologies that are used by bidders, which are best positioned to win.¹⁴

Application of ACA's Analytical Framework to Proposed Weighting Methodologies

After applying ACA's analytical framework to the various weighting methodologies (see table below), it is clear that neither US Telecom's nor the "draft" Commission's weighting methodologies produce tight clustering of weighted cost-effectiveness ratios. US Telecom's proposal produces a wide range of 31 percentage points from the 10th percentile of all bids to the

¹² Cartesian looked at the median 80 percent of bids, eliminating the top 10 percent and bottom 10 percent of locations so as to account for any "long tail" effect. This median 80 percent is used whenever we refer to the "range" or "distribution." This is another way of saying the clustering analysis ignored bids below the 10th percentile and above the 90th percentile of all bids.

¹³ The highest winning bid is the maximum weighted cost-effectiveness ratio that would still win a census block assuming every technology bids its actual cost to serve. In other words, it is the last cost-based bid that would win before all locations would be served or all funding would be disbursed. Any bidder with a higher weighted cost-effectiveness ratio than the highest winning bidder's ratio would lose.

¹⁴ While none of the methodologies favor FTTH at the Gigabit or Above Baseline tier, encouraging bidders that utilize FTTH would greatly expand the pool of bidders. Potential FTTH bidders include cable operators (552 holding companies utilizing cable modem technology, according to analysis of December 2015 Form 477 data), rate of return local exchange carriers (at least 650, according to a recent FCC posting) and electric co-ops (the National Rural Electrical Co-op Association has 900 members). See <http://transition.fcc.gov/form477/BroadbandData/Fixed/Dec15/Version%202/US-Fixed-with-Satellite-Dec2015.zip>, https://transition.fcc.gov/wcb/ACAM_231_Summary_CAFBLS_oblig_102016_Final.xlsx and <http://www.electric.coop/our-organization/>.

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90th percentile of all bids, and the “draft” Commission’s range is 38 percentage points. By creating such large potential gaps between bids, the US Telecom and “draft” Commission proposals will especially lessen the incentive for many bidders with higher weighted cost-effectiveness ratios to participate, such as those in the 70-80 percent or 80-90 percent decile. The Rural Coalition’s methodology produces somewhat better clustering, with a range of 20 percentage points. By contrast, ACA’s proposed methodology produces the tightest clustering of weighted cost-effectiveness ratios of all the proposals: 14 percentage points. Additionally, ACA’s methodology produces the tightest range between the highest winning bid and the 90th percentile of all bids, at 10 percentage points.

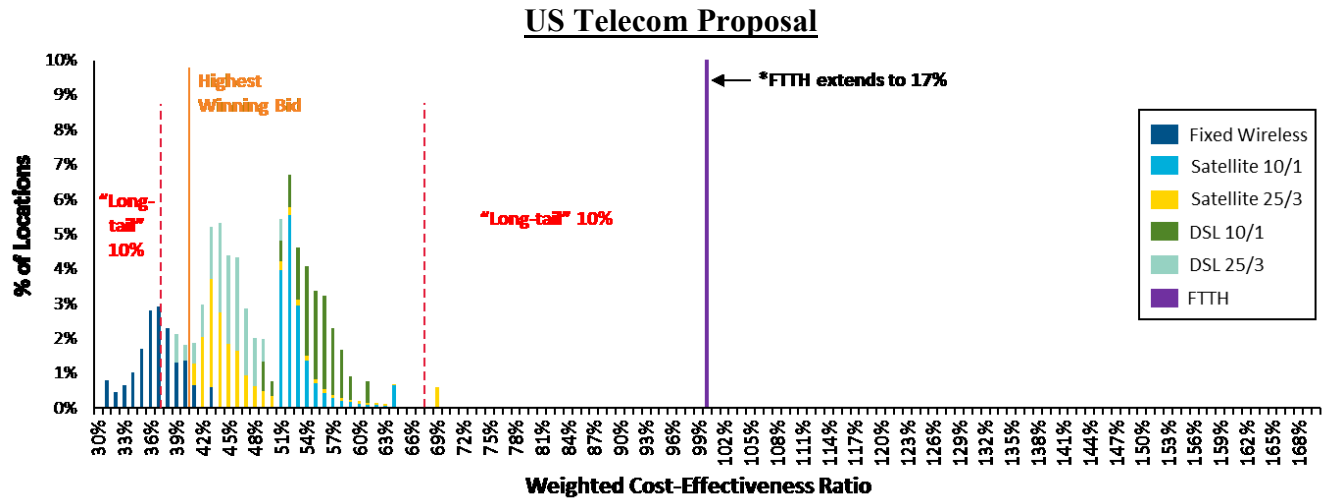
Weighting Methodologies: Clustering Analysis Summary¹⁵

	US Telecom	Rural Coalition	Draft FCC	ACA
Range in Bids Between 10th and 90th Percentile of Bids	31%	20%	37%	14%
Range in Bids Between Highest Winning Bid and 90th Percentile of Bids	27%	18%	35%	10%

The following charts, which plot the distribution of bids by technology for each of the proposals, show how particular technologies fare under each proposal:

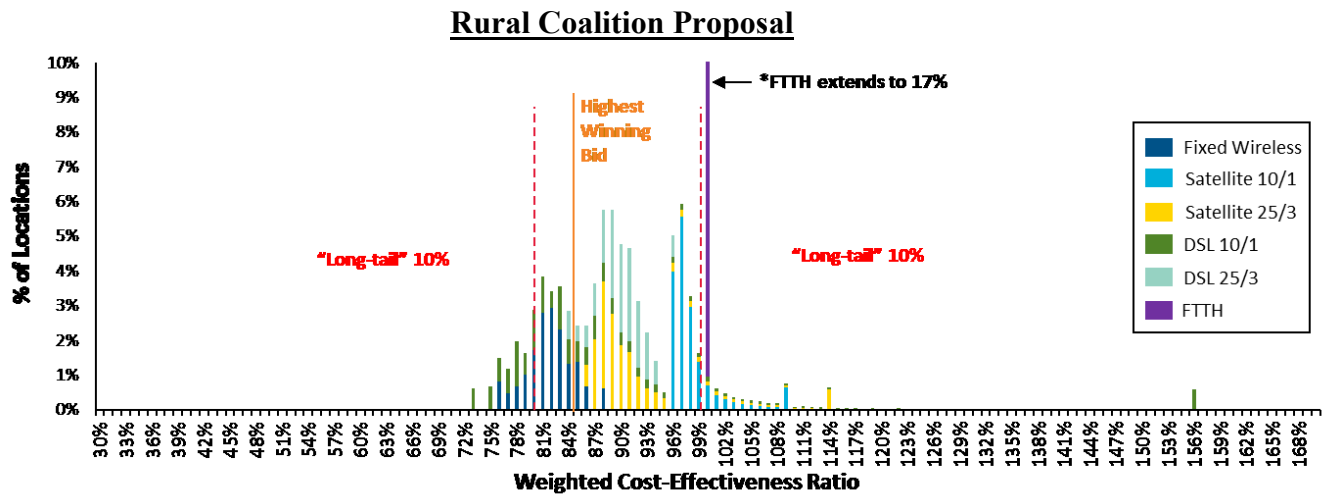
¹⁵ Charts illustrating overall distribution of bids can be found in Appendix II.

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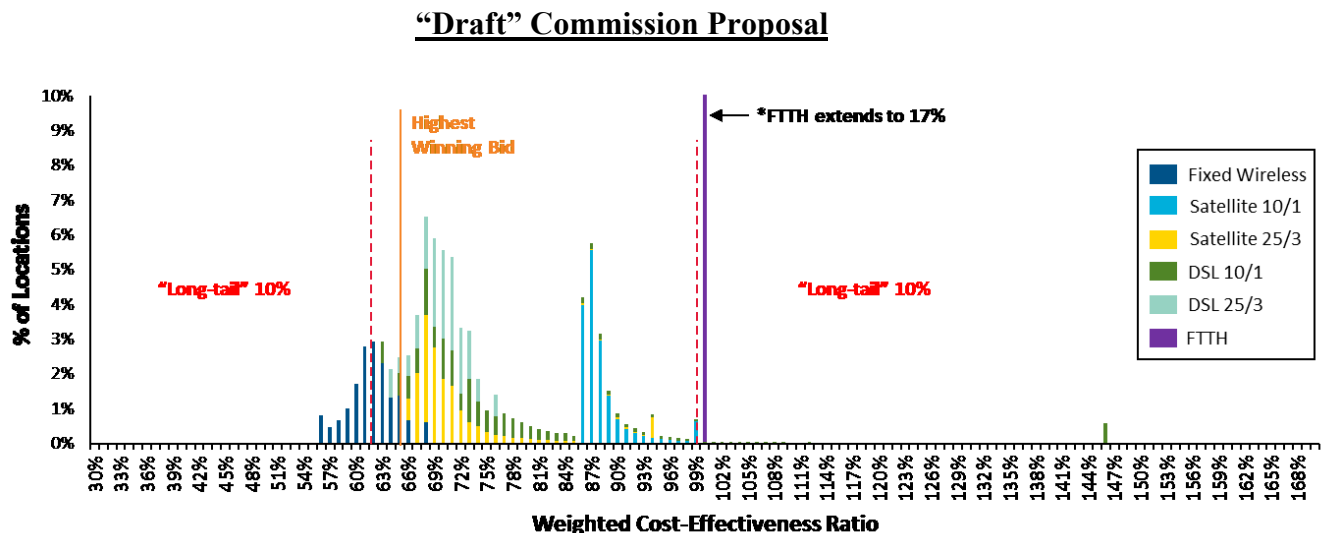


This chart demonstrates that US Telecom’s proposal is not technology neutral. It strongly favors fixed wireless, as shown by the clustering of fixed wireless above the highest winning bid’s weighted cost-effectiveness ratio of 41 percent. It also illustrates how satellite “10/1” and DSL “10/1” are not close to the highest winning bid’s ratio. Further, it illustrates how bids for FTTH effectively stand no chance of prevailing, as shown by the purple spike at 100 percent weighted cost-effectiveness ratio. With little chance of winning, FTTH bidders would have little incentive to participate. Regardless of the theoretical merits of the different weighting approaches, US Telecom’s proposed weighting methodology will so disadvantage bidders at the Gigabit and Above Baseline tiers that their participation in the auction will be, at best, *de minimis*.

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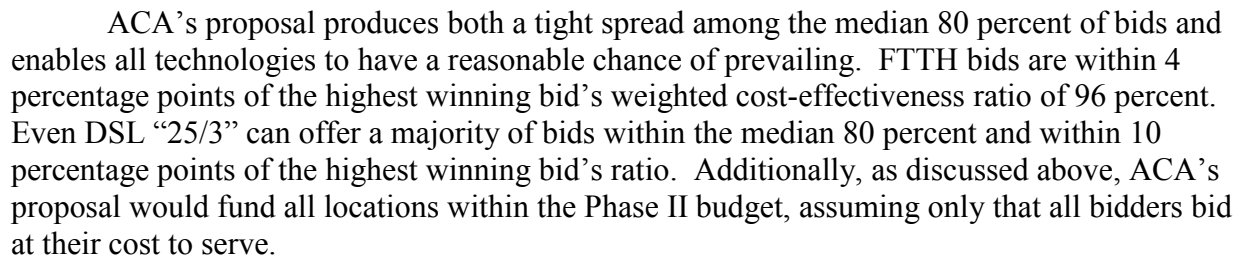
The Rural Coalition proposal produces fairly tight clustering in the median 80 percent of bids. Nonetheless, FTTH is outside the median 80 percent of bids, sending a signal to FTTH providers that their chances of winning are fairly remote.



The “draft” Commission proposal produces a wider distribution of bids than any other proposal. While fixed wireless, satellite “25/3,” DSL “25/3,” and to a lesser extent DSL “10/1” are competitive, both satellite “10/1” and FTTH are greater than 20 percentage points distant

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ACA Proposal



In sum, ACA's proposal is more competitive and technologically neutral, thereby encouraging bids by more providers deploying different types of networks. Thus, ACA submits that its approach, as demonstrated by the evidence provided herein, best serves the public interest.

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This letter is being filed electronically pursuant to Section 1.1206 of the Commission's rules.

Sincerely,



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Appendix I

Modeling Cost to Serve by Technology

To model the costs for each technology, Cartesian used a range of sources, including submissions to the Commission's Rural Broadband Experiment ("RBE").¹⁶ For FTTH and brownfield DSL providing Baseline performance, Cartesian developed cost curves¹⁷ based on housing density, utilizing data points from the Rural Broadband Experiment and other public and proprietary sources. For fixed wireless, Cartesian developed a cost curve based on a limited set of data points, informed by the knowledge that fixed wireless can more cost-effectively serve lightly populated areas due to the long-range propagation qualities of spectrum. For brownfield DSL providing Minimum performance, it assumed that upgrades to existing DSL networks could be provided solely through electronics upgrades (e.g. bonding and vectoring) and therefore costs would not be highly sensitive to housing density. To determine these costs, it used an average of RBE submissions that sought to provide DSL upgrades primarily through electronics upgrades. Finally, for satellite, it assumed very low bids that do not change with housing density due to the minimal incremental costs associated with serving additional homes with satellite broadband and satellites' near-universal US coverage areas.

For technologies that are sensitive to housing density, Cartesian developed cost curves by plotting known build-out cost data points against the housing density (housing units/square mile) for the geographies associated with each data point. Cartesian then developed "best fit" cost curves that associated a unique cost per home passed with a given housing density. These "best fit" cost curves were then used to predict the cost per home passed for each CAF auction-eligible census block, based on their housing density.¹⁸

¹⁶ For a general overview of the RBE, see <https://www.fcc.gov/general/rural-broadband-experiments>. For a summary of awarded RBE bids, see https://transition.fcc.gov/wcb/RBEOverviewChart5_4_2016.xlsx. For a list of RBE expressions of interest, see http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-326765A1.xlsx.

¹⁷ Best fit curves were generated using the number of locations served and total cost per location across fiber, fixed wireless, and Baseline performance brownfield DSL technologies.

¹⁸ The Wireline Competition Bureau released a preliminary list of eligible census blocks and location data in August 2016, which included a total 1,492,414 locations, available at https://transition.fcc.gov/wcb/Prelim_Phase_II_Auction_Eligible_CBs_081016.zip. For its analysis, Cartesian excluded all New York census blocks in the list due to the Commission's recent decision to award the state of New York \$170 million in 10-year

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For technologies that are not sensitive to housing density, Cartesian used rounded averages of existing cost per home passed data points.

The formulas used for each technology are described below, followed by tables and graphs outlining the data points and associated cost curves:

Performance Tier	Technology	Formulas (x = Location-Density)
Gigabit & Above Baseline	Fiber	$y = 18635 * x^{-0.529}$
Baseline	Fixed Wireless	$y = 5209.1 * x^{-0.62}$
Baseline	Brownfield DSL *25/3*	$y = 6718.7 * x^{-0.596}$
Baseline & High Latency	Satellite *25/3*	$y = 200$
Minimum	Brownfield DSL *10/1*	$y = 600$
Minimum & High Latency	Satellite *10/1*	$y = 100$

funding from the CAF Phase II Reverse Auction fund to cover all auction-eligible locations in New York. *See CAF New York Order.*

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Fiber-to-the-Home (“FTTH”)¹⁹

Cost per Location	Source	Location Density
\$1,623	ETC Communications, LLC ²⁰	43.94
\$1,481	Great Western Alliance Group Inc ²¹	38.51
\$3,376	TV Service, Inc. ²²	19.65
\$4,955	Callaway Electric Cooperative ²³	19.60

¹⁹ The FTTH greenfield cost-curve was generated using of RBE Expressions of Interest for fiber in new census tracts, where the proposing operator had no presence. Relatively few operators have existing fiber deployments in or near these high-cost areas; so this filter provides the most appropriate evaluation of costs most operators can expect. While the primary source for fiber cost density data is RBE Expressions of Interest, supplemental benchmarks at higher densities from internal projects and public data from large industry players like Google Fiber, CenturyLink, and the NTIA were also used. For examples, *see* Jay Yarow, “It’s Surprisingly Inexpensive For Google To Build Its Cable-Destroying Google Fiber Network,” Business Insider (Apr. 8, 2013), available at <http://www.businessinsider.com/the-cost-of-building-google-fiber-2013-4>; Ingrid Lunden, “Analyst: Google Will Spend \$84M Building Out KC’s Fiber Network To 149K Homes; \$11B If It Went Nationwide,” TechCrunch (Apr. 8, 2013), available at <https://techcrunch.com/2013/04/08/google-fiber-cost-estimate/>; “Even After Omaha, Communities Cannot Count on CenturyLink For Connectivity,” Community Networks (May 3, 2013), available at <https://muninetworks.org/content/even-after-omaha-communities-cannot-count-centurylink-connectivity>; and Public Utility District of Pend Oreille County, Quarterly Performance Progress Report for Broadband Infrastructure Projects (Aug. 27, 2013), available at http://www2.ntia.doc.gov/files/grantees/nt10bix5570059_public_utility_district_of_pend_oreille_county_ppr2013_q2.pdf.

²⁰ *See* ETC Communications, LLC Expression of Interest, WC Docket No. 10-90 (Feb. 28, 2014).

²¹ *See* Great Western Alliance Group, Inc. d/b/a Cableview Communications Expression of Interest, WC Docket No. 10-90 (Mar. 10, 2014).

²² *See* TV Service, Inc. Expression of Interest, WC Docket No. 10-90 (Mar. 6, 2014).

²³ *See* Callaway Electric Cooperative Expression of Interest, WC Docket No. 10-90 (Mar. 6, 2014).

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\$3,965	Barry Electric Cooperative ²⁴	15.02
\$5,500	UNS Energy Corporation (UNS) ²⁵	14.64
\$4,950	Callaway - Consolidated - Kingdom ²⁶	13.96
\$1,900	UNS Energy Corporation (UNS) ²⁷	13.23
\$3,500	Boycom Cablevision Inc. ²⁸	12.21
\$4,952	Consolidated Electric Cooperative ²⁹	10.62
\$4,441	South Central Alabama Broadband Cooperative District ³⁰	10.19
\$10,323	Plumas-Sierra Rural Electric Cooperative & Telecommunications ³¹	5.38

²⁴ See Barry Electric Cooperative Expression of Interest, WC Docket No. 10-90 (Mar. 6, 2014).

²⁵ See UNS Energy Corporation Expression of Interest, WC Docket No. 10-90 (Mar. 7, 2014).

²⁶ See Callaway Electric Cooperative, Consolidated Electric Cooperative, and Kingdom Technology Services, Inc. Expression of Interest, WC Docket No. 10-90 (Mar. 6, 2014).

²⁷ See See UNS Energy Corporation Expression of Interest, WC Docket No. 10-90 (Mar. 7, 2014).

²⁸ See Boycom Cablevision Inc. Expression of Interest, WC Docket No. 10-90 (Mar. 6, 2014).

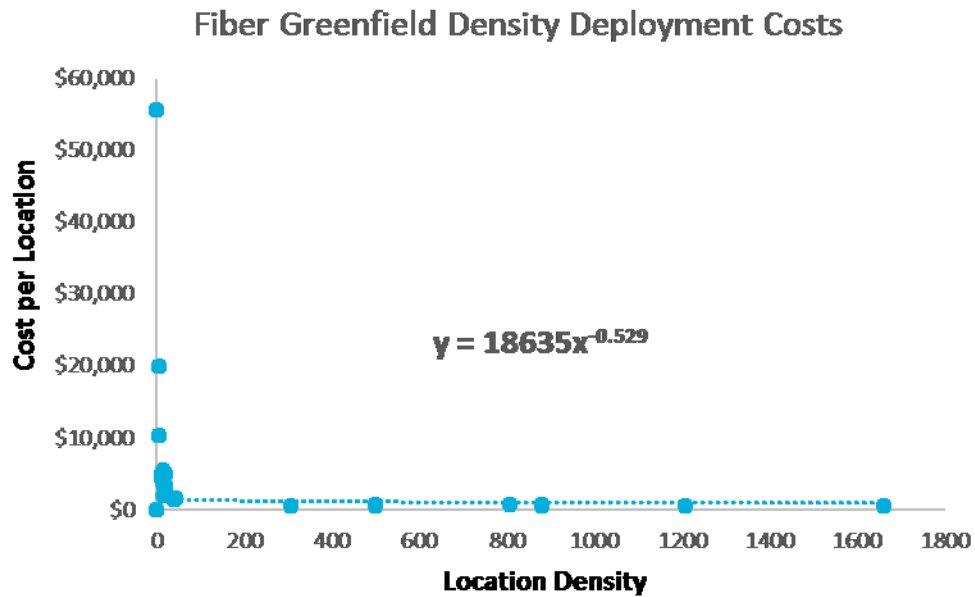
²⁹ See Consolidated Electric Cooperative Expression of Interest, WC Docket No. 10-90 (Mar. 6, 2014).

³⁰ See South Central Alabama Broadband Cooperative District Expression of Interest, WC Docket No. 10-90 (Mar. 7, 2014).

³¹ See Plumas-Sierra Rural Electric Cooperative & Telecommunications Expression of Interest, WC Docket No. 10-90 (Mar. 5, 2014).

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\$20,000	Southern Montana Telephone Company ³²	3.72
\$55,556	Southern Montana Telephone Company ³²	0.32
\$560	REDACTED ³³	306.97
\$667	REDACTED ³³	879.50
\$636	REDACTED ³³	879.50
\$625	REDACTED ³³	879.50
\$615	REDACTED ³³	500.00
\$658	REDACTED ³³	500.00
\$564	REDACTED ³³	1206.00
\$667	REDACTED ³³	806.00
\$500	REDACTED ³³	1661.00



³² See Southern Montana Telephone Company Expression of Interest, WC Docket No. 10-90 (Mar. 6, 2014).

³³ Cartesian proprietary benchmarks from internal projects.

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Fixed Wireless³⁴

Cost per Location	Source	Location Density
\$2,000	Allamakee-Clayton Electric Cooperative, Inc. ³⁵	5.00
\$1,000	First Step Internet, LLC ³⁶ & Skybeam, LLC ³⁷	15.00
\$500	Oznet Solutions ³⁸	50.00

³⁴ Cartesian used benchmarked assumptions for low, medium, and high fixed wireless bids to generate a cost-curve, as there were a limited number of fixed wireless RBE proposals available. Two of the three fixed wireless funded proposals—and the only two pure-fixed-wireless funded proposals, which provide the most direct insight into what the FCC considers an appropriate cost for fixed wireless technology without fiber—cost approximately \$1,000 per location (First Step Internet, LLC & Skybeam, LLC). This was used as our medium bid. The high bid was benchmarked with the RBE Funded Proposals Summary—the highest cost per location of an approved fixed wireless proposal was approximately \$2,185, from Allamakee-Clayton Electric Cooperative, Inc. This falls on the high end of the spectrum, as it employs hybrid fiber/fixed wireless, with fiber driving up the total cost per location served. Cartesian’s research into RBE Expressions of Interest support this price point, with the majority of fixed wireless proposals that include fiber falling in the \$2,000-\$3,000 range – of seven fixed wireless proposals which incorporate fiber reviewed, six are within \$2,000-\$3,000 per location passed. The low bid was benchmarked in RBE Expressions of Interest. Two proposals constituted the lowest cost per location in the reviewed proposals. These proposals likely exclude certain costs, like backhaul, from their expressions of interest, which drives the price down. However, if these are not costs the operators expect to incur, their proposals represent the lowest viable costs. OzNet Solutions was \$406 per location and Santel Communications Cooperative, Inc. was \$447 per location.

³⁵ See Allamakee-Clayton Electric Cooperative Expression of Interest, WC Docket No. 10-90 (Mar. 5, 2014).

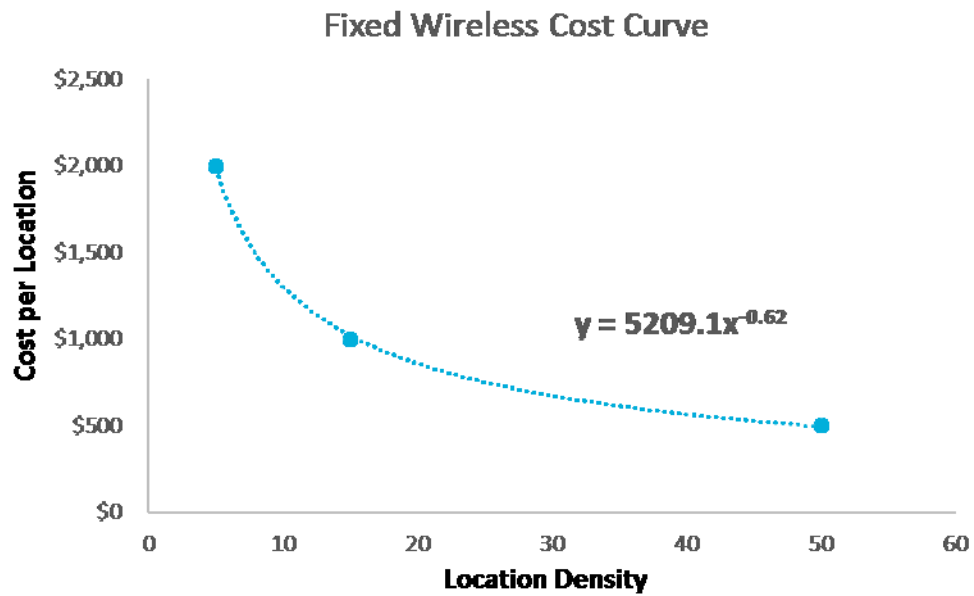
³⁶ See First Step Internet, LLC Expression of Interest, WC Docket No. 10-90 (Mar. 57, 2014).

³⁷ See “Rural Broadband Experiment Support Authorized for Ten Winning Bids for Skybeam, LLC, Consolidated Communications Networks, Inc., Delta Communications, LLC, and Allamakee-Clayton Electric Cooperative, Inc.,” WC Docket Nos. 10-90, 14-259, Public Notice, DA 15-987 (rel. Aug. 7, 2015).

³⁸ See Ozarks Internet Solutions L.L.C. Expression of Interest, WC Docket No. 10-90 (Mar. 7, 2014).

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	Santel Communications Cooperative ³⁹	
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³⁹ See Santel Communications Cooperative, Inc. Expression of Interest, WC Docket No. 10-90 (Mar. 6, 2014).

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Brownfield DSL “25/3”⁴⁰

Cost per Location	Source	Location Density
\$261	Bruce Telephone Company ⁴¹	9.74
\$1,535	Barry County Telephone Company ⁴²	34.49
\$1,908	Carr Telephone Company ⁴³	24.95
\$2,100	Fulton Telephone Company ⁴⁴	18.74
\$5,400	Range Telephone Cooperative, Inc. ⁴⁵	1.17
\$462	Chester Telephone Company ⁴⁶	25.08
\$7,500	3 Rivers Communications ⁴⁷	1.59

⁴⁰ The brownfield DSL cost-curve is generated from 10 RBE documents. Some data points used for DSL “10/1” are included here to better capture how providers in denser areas are more likely to leverage existing electronics rather than build new plant.

⁴¹ See Bruce Telephone Company, Inc. Expression of Interest, WC Docket No. 10-90 (Mar. 7, 2014).

⁴² See Barry County Telephone Company, MEI Telecom Services, and Lake Michigan Telephone Expression of Interest, WC Docket No. 10-90 (Mar. 6, 2014).

⁴³ See Carr Telephone Company Expression of Interest, WC Docket No. 10-90 (Mar. 5, 2014).

⁴⁴ See Fulton Telephone Company, Inc. Expression of Interest, WC Docket No. 10-90 (Mar. 7, 2014).

⁴⁵ See Range Telephone Cooperative, Inc. Letter of Intent, WC Docket No. 10-90 (Mar. 5, 2014).

⁴⁶ See Chester Telephone Company Expression of Interest, WC Docket No. 10-90 (Mar. 3, 2014).

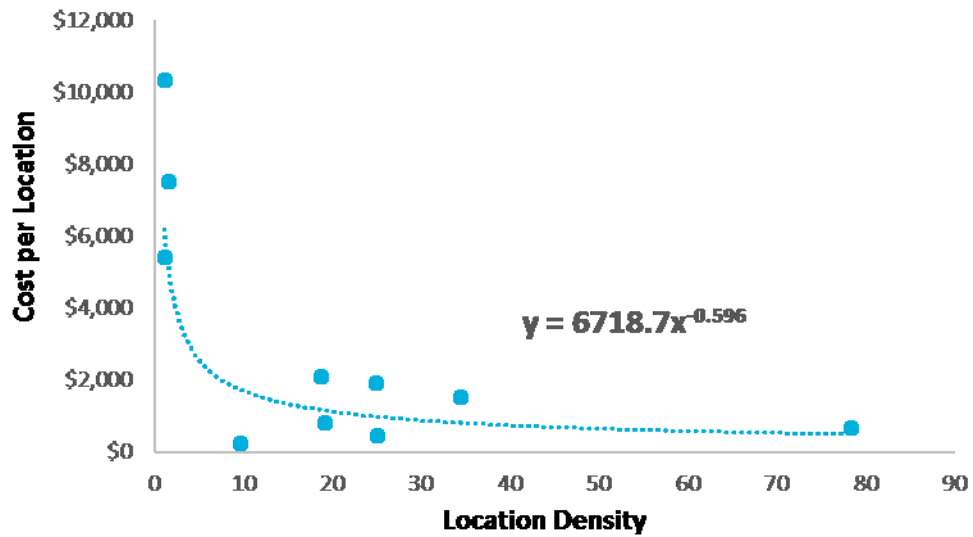
⁴⁷ See 3 Rivers Communications Expression of Interest, WC Docket No. 10-90 (Feb. 7, 2014).

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\$688	Chickamauga Telephone Corporation ⁴⁸	78.35
\$832	Waverly Hall Telephone Company ⁴⁹	19.26
\$10,333	Matanuska Telephone Company ⁵⁰	1.15

DSL Brownfield Deployment Costs



⁴⁸ See Chickamauga Telephone Corporation Expression of Interest, WC Docket No. 10-90 (Mar. 7, 2014).

⁴⁹ See Waverly Hall Telephone Company Expression of Interest, WC Docket No. 10-90 (Mar. 7, 2014).

⁵⁰ See Matanuska Telephone Association, Inc. Expression of Interest, WC Docket No. 10-90 (Mar. 7, 2014).

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Satellite “25/3”

Cost per Location	Source	Location Density
\$200	Hughes Satellite ⁵¹	Not Applicable

Brownfield DSL “10/1”

Of the 10 brownfield DSL RBE proposals observed, only four were deemed to rely exclusively on electronics upgrades, shown below. As can be seen, the cost per location actually goes down at lower densities, implying that location density is not the most influential factor in the pricing of these costs. The average cost per location between these was \$561, which for simplicity was rounded to \$600. ACA acknowledges that it is possible that some DSL “10/1” bids will require the laying of additional fiber and moving of DSLAMs closer to end-users.

Cost per Location	Source	Location Density
\$261	Bruce Telephone Company ⁵²	9.74
\$462	Chester Telephone Company ⁵³	25.08
\$688	Chickamauga Telephone Corporation ⁵⁴	78.35
\$832	Waverly Hall Telephone Company ⁵⁵	19.26

Satellite “10/1”

⁵¹ As discussed above, Hughes anticipates that the lower bound for satellite providers’ bids’ will be above \$185 per customer. For simplicity, Cartesian rounded to \$200. *See Hughes Ex Parte*.

⁵² *See* Bruce Telephone Company, Inc. Expression of Interest, WC Docket No. 10-90 (Mar. 7, 2014).

⁵³ *See* Chester Telephone Company Expression of Interest, WC Docket No. 10-90 (Mar. 3, 2014).

⁵⁴ *See* Chickamauga Telephone Corporation Expression of Interest, WC Docket No. 10-90 (Mar. 7, 2014).

⁵⁵ *See* Waverly Hall Telephone Company Expression of Interest, WC Docket No. 10-90 (Mar. 7, 2014).

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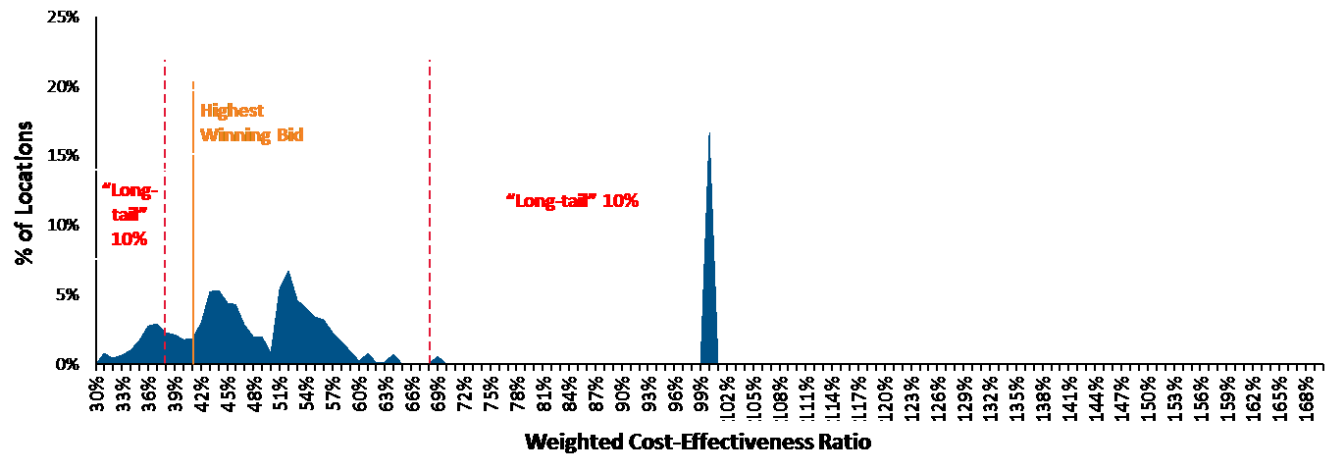
Since satellite is already available across almost all eligible areas – indeed, satellite providers HughesNet and Viasat market their services as being available anywhere in the U.S. – the incremental cost to serve a new location is effectively \$0. However, since no bidder is likely to bid \$0, Cartesian assumed a minimum bid per location of \$100 for all Minimum performance satellite bids.

Cost per Location	Source	Location Density
\$100	-	Not Applicable

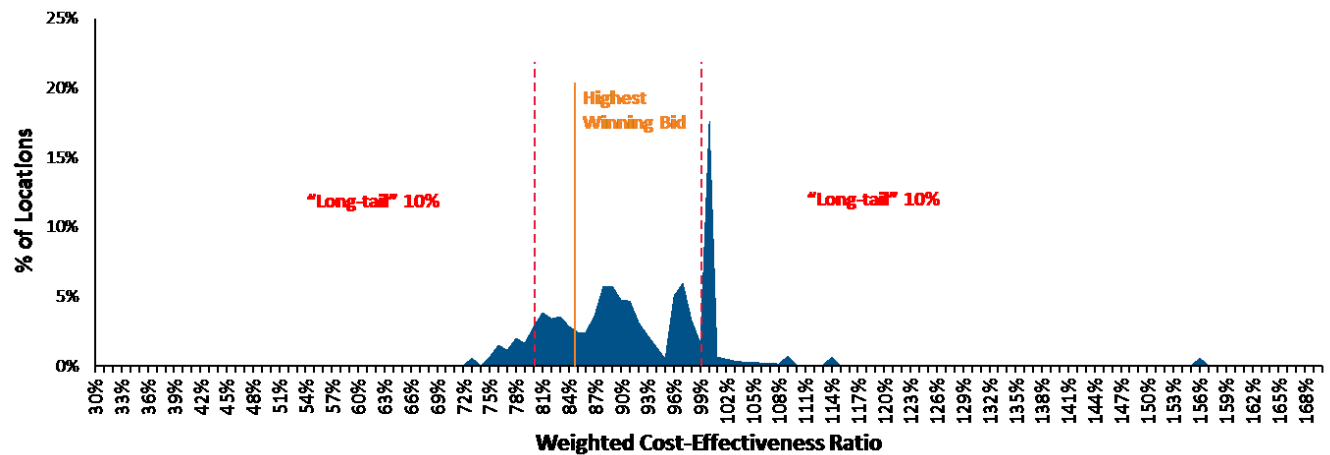
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Appendix II: Distribution Curves for Different Weighting Methodologies

US Telecom Proposal

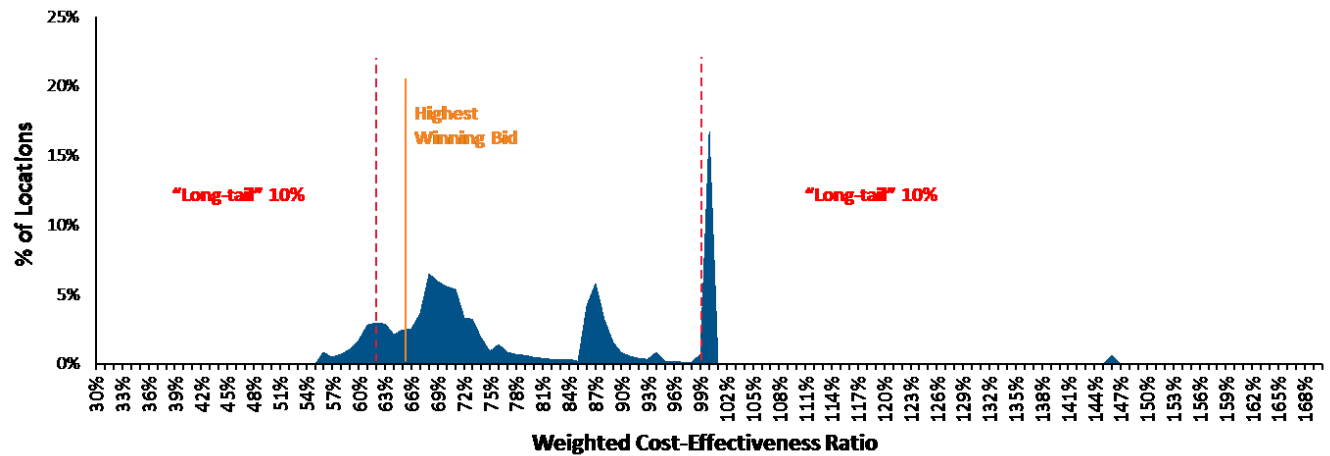


Rural Coalition Proposal



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Draft FCC Proposal



ACA Proposal

