

**Before the  
Federal Communications Commission  
Washington, D.C. 20554**

In the Matter of )  
 )  
Connect America Fund ) WC Docket No. 10-90  
 )

**ORDER ON RECONSIDERATION**

**Adopted: September 12, 2019**

**Released: September 12, 2019**

By the Chiefs, Wireline Competition Bureau, Wireless Telecommunications Bureau, and Office of Engineering and Technology:

**I. INTRODUCTION**

1. Connecting more Americans to broadband is at the core of the Commission’s goals. To this end, the Commission awarded \$1.488 billion in high-cost universal service support through the Connect America Fund (CAF) Phase II auction.<sup>1</sup> Carriers authorized to receive such support are obligated to demonstrate that their CAF-supported broadband deployments meet the speed and latency requirements on which their support is conditioned.<sup>2</sup> Additionally, carriers relying on high-latency technologies, such as satellite, must demonstrate that they can provide quality, reliable voice service as a condition of receiving support. By requiring that these carriers’ networks meet necessary performance standards, the Commission ensures that universal service support is properly spent to help close the digital divide.

2. In 2018, the Wireline Competition Bureau (WCB), the Wireless Telecommunications Bureau (jointly referred to herein as the Bureaus), and the Office of Engineering and Technology (OET) laid out a framework for conducting these tests in the *Performance Measures Order*.<sup>3</sup> Several parties filed petitions for reconsideration and applications for review.<sup>4</sup> In this Order, we address the issues raised by Hughes Network Systems, LLC (Hughes) and Viasat, Inc. (Viasat). Specifically, we: (1) refine the

<sup>1</sup> See *Connect America Fund Phase II Auction (Auction 903) Closes; Winning Bidders Announced; FCC Form 683 Due October 15, 2018*, AU Docket No. 17-182, WC Docket No. 10-90, Public Notice, 33 FCC Rcd 8257, 8257 (WCB/WTB 2018).

<sup>2</sup> See *Connect America Fund et al.*, WC Docket No. 10-90 et al., Report and Order and Further Notice of Proposed Rulemaking, 26 FCC Rcd 17663, 17705-06, para. 109 (2011), *aff’d sub nom. In re FCC 11-161*, 753 F.3d 1015 (10<sup>th</sup> Cir. 2014).

<sup>3</sup> *Connect America Fund*, WC Docket No. 10-90, Order, 33 FCC Rcd 6509 (WCB/WTB/OET 2018) (*Performance Measures Order*).

<sup>4</sup> See Application for Review and Request for Clarification of NTCA – The Rural Broadband Association (NTCA), WC Docket No. 10-90 (Sept. 19, 2018) (NTCA AFR); Application for Review of WTA – Advocates for Rural Broadband (WTA), WC Docket No. 10-90 (Sept. 19, 2018) (WTA AFR); Petition of Hughes Network Systems, LLC, for Clarification, or in the Alternative, Reconsideration, WC Docket No. 10-90 (filed Sept. 19, 2018) (Hughes PFR); Petition of Micronesian Telecommunications Corporation (MTC) for Partial Reconsideration, WC Docket No. 10-90 (filed Sept. 19, 2018) (MTC PFR); Petition of USTelecom – The Broadband Association (USTelecom), ITTA – The Voice of America’s Broadband Providers (ITTA), and the Wireless Internet Service Providers Association (WISPA) for Reconsideration and Clarification, WC Docket No. 10-90 (filed on Sept. 19, 2018) (USTelecom/ITTA/WISPA PFR); Petition of Viasat, Inc. for Reconsideration, WC Docket No. 10-90 (Sept. 19, 2018) (Viasat PFR).

requirements for Mean Opinion Score (MOS) testing and allow for substantially equivalent testing methodologies; and, (2) reject arguments that the *Performance Measures Order*'s clarifications regarding testing are inapplicable to CAF Phase II support recipients awarded support in conjunction with New York State through its New NY Broadband Program.<sup>5</sup>

3. Other parties sought reconsideration or Commission review of a variety of issues, including the availability of testing options; the number of locations to be tested; the timing for testing; the test measurement span; testing standards; and the support reductions for non-compliance. We do not address those issues here.<sup>6</sup>

## II. BACKGROUND

4. In the CAF Phase II auction, to ensure technological neutrality by taking into account the capabilities of different broadband providers, auction bids were accepted for four service tiers, each with varying speed and usage allowances, and two latency tiers, one high-latency and one low-latency.<sup>7</sup> Auction winners that submitted low-latency bids are subject to the same latency requirements as other CAF Phase II carriers, i.e., demonstrating that 95% or more of all testing hour measurements of network round trip latency are at or below 100 ms.<sup>8</sup> For winners in the CAF Phase II auction who submitted high-latency bids, the Commission required such carriers to meet a two-part standard for the latency of both their voice and broadband services: (1) for voice performance, high-latency bidders must demonstrate a MOS of four or higher using the ITU P.800 standard and, (2) for broadband, these bidders must show that 95% or more of all testing hour measurements of network round trip latency are at or below 750 ms.<sup>9</sup> The Commission then delegated to the Bureaus and OET the authority to set a specific methodology consistent with the P.800 standard.<sup>10</sup>

5. Based on an extensive review of Recommendation P.800, the Bureaus and OET required carriers to conduct a conversation-opinion test under the following conditions: (1) providers must use operational network infrastructure, such as actual satellite links, for conducting MOS testing, not laboratory-based simulations intended to reproduce service conditions; (2) the tests must be implemented using equipment, systems, and processes that are used in provisioning service to locations funded by high-cost universal service support; (3) live interviews and surveys must be conducted by an independent agency or organization (Reviewer) to determine the MOS; (4) testing must be conducted over a "single hop" satellite connection with at least one endpoint at an active subscriber location using the subscriber's end-user equipment; and (5) the second endpoint may be a centralized location from which the Reviewer conducts live interviews with the subscriber to determine the subscriber's MOS evaluation.<sup>11</sup>

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<sup>5</sup> In January 2017, the Commission granted a petition filed by New York State seeking waiver of the CAF Phase II auction program rules to allow use of CAF Phase II support in Connect America-eligible areas in New York in coordination with New York's New NY Broadband Program. As a result, CAF Phase II support is allocated in partnership with New York's New NY Broadband Program rather than through the Commission's nationwide CAF Phase II auction. *Connect America Fund*, Order, 32 FCC Rcd 968 (2017) (*New York Waiver Order*).

<sup>6</sup> Other issues raised in petitions for reconsideration and applications for review will be addressed separately.

<sup>7</sup> *Connect America Fund; ETC Annual Reports and Certifications; Rural Broadband Experiments, Report and Order and Further Notice of Proposed Rulemaking*, 31 FCC Rcd 5949, 5956-64, paras. 14-37 (2016) (*CAF Phase II Auction Order*).

<sup>8</sup> *CAF Phase II Auction Order*, 31 FCC Rcd at 5960, para. 29.

<sup>9</sup> *CAF Phase II Auction Order*, 31 FCC Rcd at 5960-61, para. 30.

<sup>10</sup> *Connect America Fund, et al.*, WC Docket No. 10-90, et al., Order on Reconsideration, 33 FCC Rcd 1380, 1386, para. 16 (2018) (*CAF Phase II Auction Reconsideration Order*).

<sup>11</sup> *Performance Measures Order*, 33 FCC Rcd at 6525-26, para. 45.

### III. DISCUSSION

#### A. MOS Testing Methodology

6. *Background.* Both Viasat and Hughes challenge aspects of the MOS testing methodologies set forth in the *Order*. Viasat argues that the use of third parties for testing is unnecessary, that the Bureaus and OET did not explain why the use of third parties was required, and that the Commission could instead conduct audits to ensure that testing was conducted properly.<sup>12</sup> In addition, Viasat claims that laboratories needed to do the MOS testing required by the *Order* are not readily available and may not charge reasonable rates and that the P.800 methodology is designed for laboratory testing not for real-world testing so the Commission should develop its own methodology.<sup>13</sup> In subsequent submissions, Viasat proposes specific changes to the methodology adopted by the Bureaus and OET. In particular, in its most recent *ex parte* letter, Viasat proposes a testing methodology that would include: (1) the use of the actual satellite network and actual equipment (as included in the *Order*); (2) live interviews and use of the ITU P.800 procedures for developing a script for testing and other testing procedures; (3) testing of a single hop in the satellite network (as included in the *Order*); (4) a requirement to achieve a MOS of four or higher for at least 80% of the customers being tested; allowing the second endpoint for testing to be a centralized location; and (5) testing of 100 participants across the nation if a carrier has 3,500 or fewer subscribers or 370 participants if it has more than 3,500 subscribers (as included in the *Order*).<sup>14</sup> Viasat also states that “another alternative would be to adopt a ‘trimmed mean’ approach, whereby the support recipient could show that the average MOS rating was four or higher after eliminating the top 5% and bottom 5% of participants’ scores.”<sup>15</sup>

7. In its petition, Hughes argues that the Commission should reconsider the use of the P.800 conversation-opinion test because the Bureaus and OET failed to seek comment after the Commission found there was insufficient record on which to make a decision.<sup>16</sup> Hughes also argues that the *Order*’s rationale for adopting the conversation-opinion test is inconsistent with the 750 ms latency requirement. Hughes claims that, “[t]he Bureaus stated that they selected the conversation-opinion test over the listening-opinion test because the ‘back-and-forth of conversations highlights delay, echo, and other issues caused by latency in a way that one-way, passive listening cannot.’ But the Commission has already imposed a latency limitation on the high-latency bidding tier – 750 ms. The purpose of the MOS score requirement is not to measure latency, it is to measure call quality. That is achieved with the listening test.”<sup>17</sup> Hughes further claims that requiring the use of the conversation-opinion test to measure a MOS of four is not technology neutral. Hughes argues that “[t]he Bureaus adopted an ‘80/80’ compliance standard for speed in part in recognition that, ‘because of technical limitations, it is currently unrealistic to expect that providers obligated to provide gigabit service . . . achieve actual speeds of 1,000 Mbps download at the customer premises’ . . . . The Bureaus should have shown similar deference to what is ‘realistic to achieve’ given the ‘technical limitations’ of satellite service,”<sup>18</sup> because “an objective

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<sup>12</sup> Viasat PFR at 2-4.

<sup>13</sup> Viasat PFR at 2-6; Letter from Matthew T. Murchison, Counsel, Viasat, to Marlene H. Dortch, Secretary, FCC, WC Docket No. 10-90, at 1-2 (June 12, 2019) (Viasat June 12, 2019 *Ex Parte*).

<sup>14</sup> Letter from Matthew T. Murchison, Counsel, Viasat, to Marlene H. Dortch, Secretary, FCC, WC Docket No. 10-90, at 2-3 (Apr. 11, 2019) (Viasat Apr. 11, 2019 *Ex Parte*).

<sup>15</sup> Viasat June 12, 2019 *Ex Parte* at 2-3.

<sup>16</sup> Hughes PFR at 4-5 (Sept. 19, 2018).

<sup>17</sup> Letter from Jennifer A. Manner, Senior Vice President, Hughes, to Marlene H. Dortch, Secretary, FCC, WC Docket No. 10-90, at 1-2 (July 16, 2018) (Hughes July 16, 2018 *Ex Parte*) (footnotes omitted).

<sup>18</sup> *Id.*

ITU-T tool for estimating MOS scores based on network parameters predicts that a network with 600 ms round-trip latency (such as a geostationary satellite network) will achieve at best a MOS of 3.72.”<sup>19</sup>

8. In addition, Hughes asserts that the Annex A requirements of ITU P.800 are too burdensome and that the Commission should only apply those conditions that were in the *Order*.<sup>20</sup> Hughes subsequently proposed an alternative method for MOS testing to be used on a prospective basis.<sup>21</sup> Under this alternative, Hughes would configure its “test subjects and conditions” to achieve a MOS of four and determine the basic network parameters of latency, jitter, and packet loss associated with this level of network performance. It would then do quarterly testing to ensure that the network achieved 80% of these performance levels 80% of the time.<sup>22</sup>

9. Several parties support the use of the conversation-opinion test. Vantage Point argues that using the listening-opinion test “would be the equivalent [of] arguing that the flight-worthiness of an airplane should be judged only on its ability to take off, and ignore the fact that it must also land.”<sup>23</sup> Similarly, ADTRAN states that the ITU P.800 makes clear that the listening-opinion test is not suitable for evaluating two-way transmissions such as voice.<sup>24</sup> ADTRAN agrees with Viasat that parties should not have to use third parties for testing because other carriers are permitted to use their own employees, and the Commission should allow laboratory-controlled testing as long as the carrier’s actual network is used.<sup>25</sup>

10. Vantage Point refutes Hughes’ claim that the required testing is inconsistent with the 80/80 speed standard; Vantage Point says, “[t]he Commission’s 80/80 compliance standard allows for small variations (up to 20%) due to overheads associated with networking protocols, interface types, and measurement variances. As an initial matter, this allowance is technology neutral, providing satellite and terrestrial operators alike with a similar compliance cushion. But this is very different than what is being asked for by Hughes. The latency introduced when using geostationary satellite communications is not 20% but rather a factor of 20 times more than the latency of a typical terrestrial based providers by the Commission’s own measurements.”<sup>26</sup> NTCA argues that by asking for laboratory rather than real-world testing, Viasat “seems to be claiming that it can satisfy the Commission’s prescribed standard for higher latency services only as long as it does not have to perform testing under the ‘real world’ conditions that the Commission clearly expected in the Performance Metrics Order.”<sup>27</sup> Similarly, Conexon claims that

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<sup>19</sup> Letter from Jennifer A. Manner, Senior Vice President, Hughes, to Marlene H. Dortch, Secretary, FCC, WC Docket No. 10-90, at 2 (Feb. 4, 2019) (Hughes Feb. 4, 2019 *Ex Parte*).

<sup>20</sup> Hughes July 16, 2018 *Ex Parte* at 1-2.

<sup>21</sup> Letter from Jennifer A. Manner, Senior Vice President, Hughes, to Marlene H. Dortch, Secretary, FCC, WC Docket No. 10-90, at 3 (Apr. 9, 2019); Letter from Jennifer A. Manner, Senior Vice President, Hughes, to Marlene H. Dortch, Secretary, FCC, WC Docket No. 10-90, at 2 (June 6, 2019) (Hughes *Ex Parte* June 6, 2019).

<sup>22</sup> Hughes June 6, 2019 *Ex Parte* at 2-3.

<sup>23</sup> Letter from Larry D. Thompson, Chief Executive Officer, Vantage Point, to Marlene H. Dortch, Secretary, FCC, WC Docket No. 10-90, at 2 (Aug. 24, 2018) (Vantage Point *Ex Parte* Aug. 24, 2018).

<sup>24</sup> ADTRAN, Inc. Comments on Petitions for Reconsideration, WC Docket No. 10-90, at 2 (Nov. 7, 2018) (ADTRAN Nov. 7, 2018 Comments).

<sup>25</sup> *Id.* at 8-9.

<sup>26</sup> Vantage Point Aug. 24, 2018 *Ex Parte* at 3 (footnote omitted).

<sup>27</sup> Letter from Michael R. Romano, Senior Vice President, Industry Affairs and Business Development, NTCA, to Marlene H. Dortch, Secretary, FCC, WC Docket No. 10-90, at 2-3 (May 2, 2019) (NTCA May 2, 2019 *Ex Parte*).

Viasat's arguments to change the standards adopted by the Bureaus and OET are inconsistent with Viasat's claims that it can meet the MOS four requirement.<sup>28</sup>

11. Hughes also seeks reconsideration of the application of the MOS testing methodology changes to the CAF Phase II auction, arguing that it would be an impermissible primarily retroactive action for the Commission to grant Viasat's request to modify after the conclusion of the CAF Phase II auction the testing conditions that were clarified in the *Performance Measures Order* before the start of the CAF Phase II auction.<sup>29</sup> According to Hughes, the requirement adopted in the *Performance Measures Order* to perform a conversational opinion test effectively established a "gating criterion" for CAF Phase II auction participation.<sup>30</sup> Hughes claims that it declined to bid in the CAF Phase II auction because an ITU-T estimator predicted that geostationary satellites could not achieve the required MOS score of 4 using the conversation-opinion test required in the *Performance Measures Order*.<sup>31</sup> Hughes argues that to now modify the testing conditions after the CAF Phase II auction has concluded as requested by Viasat will lower a "gating criterion" for participation in the auction.<sup>32</sup> Hughes contends that this would be unfair to CAF Phase II bidders who made decisions not to bid based on the rules in effect at the time of the CAF Phase II auction and would cause prospective bidders in future auctions to lose faith in the Commission's ability to conduct fair support auctions.<sup>33</sup>

12. *Discussion.* We conclude that the P.800 conversation-opinion test is the test most consistent with the Commission's *USF/ICC Transformation Order*. That Order required sufficiently low latency to enable use of real-time applications, such as VoIP.<sup>34</sup> The P.800 listening-opinion test requires that test subjects listen only, such as with a broadcasted announcement, rather than engaging in conversation.<sup>35</sup> As such, it examines only those aspects of service quality that can be determined by listening alone. It would fail to identify problems such as echo or excessive delay that could be present in an interactive, conversational setting that requires both speaking and listening. The P.800 conversation-opinion test is designed to test services that support real-time, interactive voice applications.<sup>36</sup> We disagree with Hughes' claims that: (1) the Commission in the *USF/ICC Transformation Order* intended the 750 ms latency requirement to be used to verify the feasibility of two-way applications, and (2) the Commission intended the MOS requirement to be used to measure the quality of the voice service through a listening-opinion test.<sup>37</sup> When the Commission adopted the MOS requirement for the CAF Phase II auction, it stated that "[w]hile we do not adopt the MOS scoring metric as a substitute for the milliseconds of latency requirement, we believe it can be used to help ensure *quality voice service*

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<sup>28</sup> Letter from Todd B. Lantor, Counsel to Conexon, LLC, to Marlene H. Dortch, Secretary, FCC, at 2-3 (Mar. 25, 2019) (*Conexon Ex Parte*).

<sup>29</sup> Hughes Opposition at 2-3; Hughes Reply at 7-9; Letter from Jennifer A. Manner, Senior Vice President, Hughes, to Marlene H. Dortch, Secretary, FCC, WC Docket No. 10-90 (Dec. 7, 2018) (Hughes Dec. 7, 2018 *Ex Parte*); Hughes Feb. 4, 2019 *Ex Parte*; see also Letter from Jennifer A. Manner, Senior Vice President, Hughes, to Marlene H. Dortch, Secretary, FCC, WC Docket No. 10-90 (Mar. 11, 2019) (Hughes Mar. 11, 2019 *Ex Parte*). The *Performance Measures Order* was released two weeks before bidding in the CAF Phase II auction began, but after short-form applications had already been filed. Hughes Reply at 8.

<sup>30</sup> Hughes Feb. 4, 2019 *Ex Parte* at 2; Hughes Mar. 11, 2019 *Ex Parte* at 2.

<sup>31</sup> Hughes Reply at 8; Hughes Mar. 11, 2019 *Ex Parte* at 2.

<sup>32</sup> Hughes Mar. 11, 2019 *Ex Parte* at 1.

<sup>33</sup> Hughes Opposition at 3; Hughes Reply at 8-9.

<sup>34</sup> *USF/ICC Transformation Order*, 26 FCC Rcd at 17698, para. 96.

<sup>35</sup> International Telecommunication Union, Telecommunication Standardization Sector, Series P: Telephone Transmission Quality, Methods for subjective determination of quality, P.800, at 4 (Aug. 1996) (ITU Series P.800).

<sup>36</sup> *Id.* at 3.

<sup>37</sup> Hughes July 16, 2018 *Ex Parte* at 1-2.

*performance* for bids designated high latency.”<sup>38</sup> The Commission meant that the entire voice service—the “voice service performance”—should have a MOS of four rather than just the quality of the heard voice; therefore, the conversation-opinion test, rather than the listening-opinion test, is most appropriate.

13. Although the Commission previously determined that there was an insufficient record on which to determine which P.800 test is most appropriate,<sup>39</sup> we find that there was a sufficient basis for our finding, based on their own evaluation, that only the P.800 conversation test is suitable for measuring the quality of services that support real-time, interactive voice applications such as VoIP. As ADTRAN stated,

In the decision on reconsideration of the *Broadband Measurements Order*, the Commission discussed ADTRAN’s Petition for Clarification or Reconsideration. The Commission indicated that it had not yet specified which of the ITU Recommendation P.800 methods could be used to demonstrate compliance with the voice service quality obligation, but would defer to the Bureaus to make that decision. The Commission did indicate that the record on this point was “sparse.” But while the record on this issue is “sparse,” it is certainly adequate to support the [Bureaus’ and OET’s] decision to require a conversational-opinion test. ADTRAN and others had supported such a specification, and ITU-T Recommendation P.800 itself makes clear that a listening-only test is applicable to unidirectional transmissions, and not conversations.<sup>40</sup>

Indeed, the P.800 states that,

[L]istening tests have direct applications in the assessment of physical transmission systems which are essentially unidirectional. Examples include broadcast circuits, public address systems and recorded announcement systems in which listening degradations such as loss, noise and distortion may be present. Results of listening-only tests can be applied, but only with certain reservations, to the prediction of the assessment for conversation conducted over a two-way system, such as a connection in a public switched telephone network.<sup>41</sup>

Although we did not seek additional comment, our detailed analysis of why the conversation-opinion test best reflects the Commission’s prior decisions is well supported.

14. Moreover, even if there was an insufficient record for our consideration in July 2018, the error was harmless because we have now considered a robust record<sup>42</sup> and find that the P.800 conversation-opinion test will best ensure that customers served by high-latency providers will enjoy quality voice services. As Vantage Point and ADTRAN explain, and the P.800 standard itself makes clear, the listening-opinion test is designed for one-way services, such as broadcasts, and fails to take into account the quality issues of two-way services, such as echo and delay.<sup>43</sup> The Commission’s 2011 decision that latency must be sufficient for two-way services, such as VoIP, makes the conversation-opinion test the best choice to measure interactive voice quality.

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<sup>38</sup> *CAF Phase II Auction Order*, 31 FCC Rcd at 5962, para. 33 (emphasis added).

<sup>39</sup> *CAF Phase II Auction Reconsideration Order*, 33 FCC Rcd at 1386, para. 16.

<sup>40</sup> ADTRAN Nov. 7, 2018 Comments at 6 (citations omitted).

<sup>41</sup> ITU Series P.800 at 4. Although the listening-opinion test can be applied to telephone calls, with reservations, the P.800 requires that the following factors must be taken into account: talking degradations, such as sidetone and echo, and conversation degradations, such as propagation time and mutilation of speech by the action of voice-operated devices. *Id.* Hughes, though noting this, *see* Hughes July 16, 2018 *Ex Parte* at 2, n.7, provides no indication of how this would be accomplished.

<sup>42</sup> *See, e.g.*, Vantage Point Aug. 24, 2018 *Ex Parte* at 2; ADTRAN Nov. 7, 2018 Comments at 2; Hughes PFR at 4-5.

<sup>43</sup> Vantage Point Aug. 24, 2018 *Ex Parte* at 2; ADTRAN Nov. 7, 2018 Comments at 2; ITU Series P.800 at 4.

15. We disagree with Hughes' argument that requirements in the *Performance Measures Order* will make it difficult or impossible for satellite providers to comply with the MOS testing requirements.<sup>44</sup> Although Hughes states that a satellite network can at best obtain a MOS of 3.72,<sup>45</sup> that result is based on a specific set of assumptions for a predictive network test, not on the opinions of test subjects using the actual network.<sup>46</sup> No party has presented any evidence that a satellite carrier testing its customers on the actual satellite network cannot show a MOS of 4. Viasat has stated that "under its current understanding of the testing parameters, it expects that its future CAF II-supported voice offering will meet or exceed a MOS of four."<sup>47</sup> As Hughes itself points out, "[r]eal world experience also shows that satellite voice customers are satisfied with their voice service," and "churn levels for customers subscribing to both broadband and Hughes's satellite-based VoIP product have been even lower than churn levels for customers for Hughes's broadband-only customers."<sup>48</sup>

16. We disagree with those arguing that the P.800 conversation-opinion test is unsuitable for testing of actual customers at their homes or businesses.<sup>49</sup> The P.800 conversation-opinion laboratory test is designed to simulate real-world conditions.<sup>50</sup> Testing of actual customers in the locations where they have service eliminates the need to create simulated conditions. For example, the P.800 laboratory protocols permit testers to vary such parameters as background noise. If actual customers are tested in their homes or small businesses, however, there is no need to simulate real-world background noise—it is already present in the customers' environment. Thus, we will maintain testing, based on P.800 protocols that we intend to further develop, using actual customers where they get service as an option for determining the MOS.<sup>51</sup> However, we recognize that the testing protocols in P.800, to be developed by WCB, as noted below, are extensive and may require customers to be actively engaged in the testing process for some period of time. It is possible that customers may not be willing to participate in the testing for the length of time needed. Properly exercising a communications system requires conversations lasting several minutes because a typical test session requires four to five minutes duration where the conversation period takes two to three minutes and the response period (i.e., the rating period) another two minutes.<sup>52</sup> In addition, test subjects may need to be instructed in test procedures before the test begins. Therefore, as explained below, we adopt an alternative testing methodology that will allow for P.800 centralized-location testing that will ensure the same quality of voice service as if a carrier performs testing on its own customers.

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<sup>44</sup> See Hughes Dec. 7, 2018 *Ex Parte* at 5-6; see also Hughes PFR at 2-4.

<sup>45</sup> See Hughes Feb. 4, 2019 *Ex Parte* at 2.

<sup>46</sup> See Letter from John P. Janka and Matthew T. Murchison, Counsel for Viasat Carrier Services, Inc., to Marlene H. Dortch, Secretary, FCC, WC Docket. No. 10-90, at 2-4 (Apr. 3, 2019) (noting multiple issues with Hughes' claim).

<sup>47</sup> *Id.* at 2.

<sup>48</sup> Hughes Reply at 10-11. Although we believe that satellite providers with a well-engineered and well-maintained network will be able to show a MOS of 4 under the methodologies adopted herein, we do not agree with Hughes that customer satisfaction with a particular provider's service renders performance testing unnecessary. See Hughes Reply at 10-11. The purpose of performance testing is to ensure that all carriers receiving CAF funding are meeting their obligations. The fact that customers may be satisfied with one particular provider's service does not mitigate the need to ensure that all carriers, including the carrier whose customers expressed satisfaction at one point in time, are providing the speed, latency, and voice quality that is required by the USF program.

<sup>49</sup> Viasat PFR at 2-6; ADTRAN Nov. 7, 2018 Comments at 8-9.

<sup>50</sup> ITU Series P.800 at 5.

<sup>51</sup> International Telecommunication Union, Telecommunication Standardization Sector, Series P: Telephone Transmission Quality, Subjective evaluation of conversational quality, P.805 (April 2007) (ITU Series P.805) ("This conversation test methodology can be adapted to field testing.").

<sup>52</sup> *Id.* at 3.

17. We also disagree with carriers that argue that carriers conducting customer testing should be able to use their own employees to conduct such tests and that the prohibition against doing so is arbitrary and capricious because speed and latency performance testing is performed by employees and only satellite companies must perform MOS testing.<sup>53</sup> First, we note that satellite carriers are under the same testing requirements as all other providers and can self-test using their own employees for speed and latency testing. Second, unlike speed and latency testing, which involve taking measurements and can be largely automated, conversational MOS testing requires test subjects to use the service being tested to carry on a conversation, and then to rate the service and certain service characteristics based on that experience. Because MOS testing depends on obtaining test subjects' opinions/ratings, MOS testing is more subjective than technical testing that solely involves obtaining objective measurements. If a carrier's employees were to talk directly to customers or test subjects, those employees may, even inadvertently, influence customer test responses. We note that audits of the testing results after the fact may not indicate whether this type of influence of test subjects had occurred unless the Commission were to require that all testing be recorded so auditors could hear the testing, which would be burdensome for both carriers and auditors. In addition, a customer or test subject may be more reticent to express an honest opinion to a company employee. We agree, however, that laboratories specializing in MOS testing may not be readily available. Therefore, we allow testing to be conducted by independent entities, which could include a company that specializes in MOS testing or other testing of communications services, but could also be a polling firm or consumer research firm, to ensure that there is no bias.

18. As explained below, we adopt several variations for MOS testing. We believe that each methodology can be successfully used to determine whether a carrier achieves a MOS of at least four.<sup>54</sup> We disagree with NTCA and Conexon that Viasat's request for changes to the methodology adopted by the Bureaus and OET necessarily means that Viasat is unable to meet the MOS of at least four.<sup>55</sup> Providing carriers multiple options for testing will minimize the burdens on both carriers and customers. Allowing multiple methodologies, as long as they each satisfy the Commission's requirements, is consistent with Commission precedent in other circumstances. For example, in 1999, the Commission allowed carriers to use either a handset-based approach or a hybrid approach to meet E911 location requirements in addition to the network-based solution that had been approved previously.<sup>56</sup> The Commission stated that, "[w]hile it does not appear that any single network-based or handset-based location technology is perfect in all situations or for all wireless transmission technologies, both network and handset-based solutions may provide location information by 2001 that meets or exceeds our accuracy requirements."<sup>57</sup> Similarly, if there are multiple methodologies that will each ensure that the carrier is meeting our MOS requirements while minimizing the burden on carriers and/or customers, we see nothing inconsistent with the Commission's prior orders if we adopt such methodologies as alternatives.

19. First, we affirm the *Order's* adoption of live-subject customer testing using the P.800 conversation-opinion test methodology, with some modifications. As explained above, we decline to allow self-testing for MOS to avoid the possible introduction of bias into the test results. However, we recognize that there are few laboratories that specialize or are in a position to conduct such testing and

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<sup>53</sup> Viasat PFR at 2-4; ADTRAN Nov. 7, 2018 Comments at 8-9.

<sup>54</sup> If, as Hughes noted is a possibility, Hughes Feb. 4, 2019 *Ex Parte* at 2, a carrier is unable to achieve a MOS of four or greater under the methodologies adopted in this Order or subsequently, then it would not be in compliance with our performance standards.

<sup>55</sup> NTCA May 2, 2019 *Ex Parte* at 2-3; Conexon *Ex Parte* at 2-3.

<sup>56</sup> *Revision of the Commission's Rules To Ensure Compatibility with Enhanced 900 Emergency Calling Systems*, Third Report and Order, CC Docket No. 94-102, 14 FCC Rcd 17388, 17391 (1999).

<sup>57</sup> *Id.*



that the cost of such testing may be high.<sup>58</sup> Therefore, we decide above to permit carriers to use any independent entity with telecommunications testing, polling or consumer research expertise to conduct the testing. We agree with Viasat that a common testing procedure should be used to interact with customers.<sup>59</sup> Therefore, WCB intends to develop the procedures to be used for this testing based on Annex A of P.800 and associated ITU P.805.<sup>60</sup>

20. Viasat also suggests that “real-world” factors may affect the MOS-evaluating conversation that are not accounted for in the P.800 conversation-opinion test procedures, such as customer issues with the provider unrelated to service quality.<sup>61</sup> To address this issue, Viasat suggests either requiring only that 80% of test subjects give an Opinion Score of at least four or that the Commission allow trimming of the top 5% and the bottom 5% of the data prior to determining the MOS.<sup>62</sup> We do not agree that either of these specific alternatives is appropriate. Ignoring 20% of the testing respondents in evaluating service, absent evidence that this is a reasonable practice, is arbitrary and would allow the carrier to be in compliance with our standards even if 20% of those tested were experiencing voice service of terrible quality. Trimming of the data in some way may be appropriate but cannot in advance determine what the appropriate level of trimming should be and, thus, reject Viasat’s top 5% and bottom 5% proposal. Accordingly, we require that carriers submit all of the testing data. We will then use standard statistical methodologies to trim the data, if warranted. Once the data have been submitted, carriers may submit an analysis using standard statistical methodologies showing support for trimming their data, which the Commission will review prior to making a determination. Compliance will be calculated similar to what is done for speed and latency, i.e., by dividing the MOS achieved by four and multiplying by 100. For example, if a carrier gets a MOS of 3.2, the Universal Service Administrative Company—which will handle compliance calculations—will divide 3.2 by 4 which gives a compliance rate of 80%.

21. We agree with Viasat that this type of testing may be costly, particularly given the requirement to use independent third parties (Reviewers) to conduct the tests. Therefore, rather than testing quarterly, we require providers using this MOS testing methodology to test twice in each calendar year, with the two testing instances separated by at least five months. Although we continue to require quarterly testing for more automated test measurements, we find that twice yearly testing strikes a better balance between the need for MOS testing under different circumstances throughout the year and minimizing the burden on providers.

22. Second, as an alternative to testing of actual customers, we adopt a methodology such that carriers may perform P.800 conversation-opinion MOS testing at a centralized location using test subjects rather than customers. As Viasat states, the P.800 provides procedures for MOS testing in the laboratory environment,<sup>63</sup> although the P.800 makes clear that the “conversation test methodology can be

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<sup>58</sup> Viasat PFR at 2-6.

<sup>59</sup> Viasat Apr. 11, 2019 *Ex Parte* at 2-3.

<sup>60</sup> In addition to testing voice service quality over a single hop satellite connection that is provided on the actual network used to provide service to CAF-supported locations, using Reviewers from an independent entity, and the other requirements adopted herein, we anticipate that WCB will adopt requirements, including but not limited to, for the conversational tasks that are performed by test subjects, the questions that are asked at the completion of these tasks to obtain the test subjects’ ratings/scores of voice service quality, the location of the test subjects (e.g., for the alternative test methodology, test subjects must be in separate rooms or otherwise positioned within the centralized location so that they cannot see or hear each other, except over the satellite network connection, during their conversation and subsequent scoring of the service), and the timing of scoring submission.

<sup>61</sup> *Id.* at 3.

<sup>62</sup> Viasat June 12, 2019 *Ex Parte* at 2.

<sup>63</sup> Viasat PFR at 5 (footnote omitted).

adopted to field testing.”<sup>64</sup> As noted above, we recognize that there are few laboratories that specialize or are in a position to conduct such testing, that the cost of such testing may be high, and that customers may resist spending the time required to perform a conversation-opinion test. Therefore, we will allow carriers to conduct P.800 conversation-opinion testing in a centralized environment, rather than a laboratory, using non-customer test subjects and the actual satellite network in a manner consistent with the ITU-T P.800. As with actual customer testing, neither the Reviewers nor the test subjects may be carrier employees, but the testing does not need to occur in a laboratory environment. Rather, carriers may use a centralized location as long as the actual network<sup>65</sup> is used for testing and the test subjects, who may be compensated, use consumer hardware for the testing of the type typically used by the carrier’s customers. The Reviewers must be from an independent entity, such as a polling or consumer research firm, and the test subjects must be independent of the carrier. The testing procedure will be developed by WCB, as noted above. Although to mitigate the costs we only require such testing to be conducted twice per calendar year, as defined above, we require that each testing instance be conducted from a separate location served by a different network beam – assuming the provider has two or more operational beams – so that the same part of the network is not tested each time. We will use the same trimming procedures and compliance calculations as with customer testing.

23. We note that Hughes has proposed an additional alternative methodology for testing voice service quality required of CAF support recipients.<sup>66</sup> This proposal may provide reasonably equivalent testing but is complex and substantially different from what we adopted. In essence, Hughes proposes developing a predictive model for voice quality by determining the latency, jitter, and packet loss associated with a MOS of four to be followed by quarterly testing of the latency, jitter, and packet loss.<sup>67</sup> We intend to continue our review of this methodology to determine if it will provide similar assurance of a MOS of at least four to those testing methodologies adopted herein.

24. We reject Hughes’ arguments regarding application of the performance measures to the CAF Phase II auction. Our decision to modify now, after the conclusion of the CAF Phase II auction, the testing conditions that were clarified in the *Performance Measures Order* before the start of the CAF Phase II auction is not an impermissible primarily retroactive action. The modifications to the testing conditions we adopt do not alter “the past legal consequences of past actions.”<sup>68</sup> Rather, the modifications will apply when tests are conducted in the future. They do not render Hughes’ past actions illegal or otherwise sanctionable and thus they do not “increase [Hughes’] liability for *past* conduct.”<sup>69</sup> In addition, the modifications to the testing conditions do not “impair rights [Hughes] possessed when [it] acted.”<sup>70</sup> Neither Hughes nor any other CAF Phase II bidder had a “right” that a particular testing condition (either the testing conditions established in the *CAF Phase II Auction Order* or as subsequently clarified in the *Performance Measures Order*) would remain in place in perpetuity without further modification by the

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<sup>64</sup> ITU-T P.805 at 3.

<sup>65</sup> As with MOS testing of satellite carrier customers, we require testing to be implemented using equipment, systems, and processes that are used in provisioning service to locations funded by high-cost universal service support.

<sup>66</sup> See Hughes June 6, 2019 *Ex Parte* at 2-3.

<sup>67</sup> See *id.*; see also Letter from Jennifer A. Manner, Senior Vice President, Hughes, to Marlene H. Dortch, Secretary, FCC, WC Docket No. 10-90, at 2 (June 27, 2019).

<sup>68</sup> *Mobile Relay Assocs. v. FCC*, 457 F.3d 1, 11 (D.C. Cir. 2006).

<sup>69</sup> *Landgraf v. USI Film Prods.*, 511 U.S. 244, 280 (1994). See *National Cable & Telecommunications Ass’n v. FCC*, 567 F.3d 659, 670 (D.C. Cir. 2009) (*NCTA*) (Commission rule banning exclusivity agreements between cable companies and owners of apartment buildings “impaired the future value of past bargains but has not rendered past actions illegal or otherwise sanctionable”).

<sup>70</sup> *Landgraf*, 511 U.S. at 280.

Commission.<sup>71</sup> In addition, Hughes does not identify any “new duties with respect to transactions already completed” that the modifications impose.<sup>72</sup>

25. At most, our decision to modify the testing conditions after the conclusion of the CAF Phase II auction will arguably “upset[] expectations based on prior law”<sup>73</sup> or “impair[] the future value of past bargains.”<sup>74</sup> As noted below, such secondarily retroactive actions will be upheld if reasonable and require us to balance the harm of upsetting prior expectations or existing investments against the benefits of applying the rules to those preexisting interests.<sup>75</sup>

26. We conclude that there are important public interest benefits in modifying the testing conditions. The modifications we adopt here ensure that carriers are meeting our MOS requirements while at the same time minimizing unnecessary burdens on carriers and their customers.<sup>76</sup> To be sure, we recognize that modifying the testing conditions now, after the conclusion of the CAF Phase II auction, may upset the expectations of losing bidders or those who elected not to participate, including Hughes, who claims to have not bid in the CAF Phase II auction based on its view that the pre-auction testing conditions as clarified in the *Performance Measures Order* were difficult or impossible to meet.<sup>77</sup> We find, however, that such concerns are minimized here and are outweighed by the benefits noted above. When bidding in the CAF Phase II auction began, the period for filing a Petition for Reconsideration of the *Performance Measures Order* had not ended, meaning the clarifications adopted in the *Performance Measures Order* were subject to change.<sup>78</sup> Indeed, both Hughes and Viasat had filed letters with the Commission after the *Performance Measures Order* was released but before the bidding began expressing concern with the testing conditions adopted in the *Performance Measures Order*, thus demonstrating that the testing conditions were a potential subject for revision post-auction.<sup>79</sup> Thus, on balance, we find that any upset expectations are outweighed by the benefits of minimizing unnecessary burdens on carriers and their customers imposed by the testing regime. Accordingly, we conclude that modifying now, after the

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<sup>71</sup> See *Celtronix Telemetry, Inc. v. FCC*, 272 F.3d 585, 589 (D.C. Cir. 2001), *cert. denied*, 536 U.S. 923 (2002) (“[I]t is undisputed that the Commission always retained the power to alter the term of existing licenses by rulemaking.”) (citations omitted); *DIRECTV, Inc. v. FCC*, 110 F.3d 816, 826 (D.C. Cir. 1997) (“The Commission ‘is entitled to reconsider and revise its views as to the public interest and the means needed to protect that interest’ . . . if it gives a reasoned explanation for the revision.”) (quoting *Black Citizens for a Fair Media v. FCC*, 719 F.2d 407, 411 (D.C. Cir. 1983)).

<sup>72</sup> *Landgraf*, 511 U.S. at 280.

<sup>73</sup> *DIRECTV*, 110 F.3d at 826 (quoting *Landgraf*, 511 U.S. at 280).

<sup>74</sup> *NCTA*, 567 F.3d at 670.

<sup>75</sup> See *infra* para. 30.

<sup>76</sup> See *supra* para. 18.

<sup>77</sup> Hughes Reply at 8; Hughes Mar. 11, 2019 *Ex Parte* at 1-2. In *U.S. Airwaves*, the D.C. Circuit explained that fairness to losing bidders is a relevant consideration when the Commission makes post-auction changes that are favorable to winning bidders. See *U.S. Airwaves, Inc. v. FCC*, 232 F.3d 227, 235-36 (D.C. Cir. 2000) (upholding secondarily retroactive amendments to the financing options available to winning auction bidders in response to challenge from losing bidder claiming that it would have bid more had it known the Commission was going to adopt such favorable post-auction amendments to the rules, concluding that the Commission “reasonably exercised its discretion to balance fairness to losing bidders with the needs of the market and with the public interest”).

<sup>78</sup> See *NCTA*, 567 F.3d at 671 (upholding secondarily retroactive rule banning exclusive contracts and stating that “[l]egitimate expectations . . . were left largely undisturbed” because the lawfulness of exclusivity clauses had been under consideration by the Commission).

<sup>79</sup> See Hughes July 16, 2018 *Ex Parte*; Letter from Jennifer A. Manner, Senior Vice President, Hughes, to Marlene H. Dortch, Secretary, FCC, WC Docket No. 10-90 (July 19, 2018) (Hughes July 19, 2018 *Ex Parte*); Letter from John P. Janka and Jarrett S. Taubman, Counsel, Viasat, to Marlene H. Dortch, Secretary, FCC, WC Docket No. 10-90 (July 23, 2018).

conclusion of the CAF Phase II auction, the testing conditions that were clarified in the *Performance Measures Order* before the start of the CAF Phase II auction is reasonable, both “in substance and in being made retroactive.”<sup>80</sup>

## B. Application of MOS Testing Methodology to the NY Broadband Program

27. *Background.* Hughes argues in its Petition that it was an impermissible primarily retroactive action for the Bureaus and OET to apply to the NY Broadband Program auction winners the clarifications for implementing the ITU P.800 standard that were subsequently adopted in the *Performance Measures Order*.<sup>81</sup> If the Bureau’s action was not primarily retroactive, then Hughes argues that the Bureau’s action was at least secondarily retroactive and should be reconsidered because the Bureaus’ and OET’s decision was not reasonable.<sup>82</sup>

28. *Discussion.* An agency order is impermissible as “primarily retroactive” if it “alters the *past* legal consequences of past actions.”<sup>83</sup> An agency order that “alters the future effect, not the past legal consequences” of an action or that “upsets expectations based on prior law” is not primarily retroactive.<sup>84</sup> Rather, such an order is considered secondarily retroactive and will be upheld if “reasonable, *i.e.*, if it is not arbitrary or capricious,”<sup>85</sup> both “in substance and in being made retroactive.”<sup>86</sup>

29. We reject Hughes’ retroactivity arguments. Our decision to apply to NY Broadband Program Auction winners the clarifications subsequently adopted in the *Performance Measures Order* was not an impermissible primarily retroactive action. The clarifications adopted in the *Performance Measures Order* and as further refined in this Order do not alter “the past legal consequences of past actions.”<sup>87</sup> Rather, the clarifications, including the requirement to use the conversation-opinion test, will apply when Hughes conducts tests in the future. They do not render Hughes’ past actions illegal or otherwise sanctionable and thus they do not “increase [Hughes’] liability for *past* conduct.”<sup>88</sup> In addition, the clarifications do not “impair rights [Hughes] possessed when [it] acted”<sup>89</sup> because the clarifications do not apply to tests conducted in the past. In addition, Hughes never had a “right” to continue to use the ITU-T P.800 protocol, including the listening option, in perpetuity without further clarification by the Commission.<sup>90</sup> Indeed, in the *New York Waiver Order*, the Commission put Hughes on notice prior to the

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<sup>80</sup> *U.S. Airwaves*, 232 F.3d at 233.

<sup>81</sup> See Hughes PFR at 6-7; Hughes Reply at 14-16; Hughes Dec. 7, 2018 *Ex Parte* at 5.

<sup>82</sup> See Hughes Dec. 7, 2018 *Ex Parte* at 5-6; see also Hughes PFR at 2, 3-4.

<sup>83</sup> *Mobile Relay Assocs. v. FCC*, 457 F.3d at 11 (quoting *Bowen v. Georgetown Univ. Hosp.*, 488 U.S. 204, 219 (1988) (Scalia, J., concurring) (emphasis in original)). An order can be primarily retroactive if it (1) “increase[s] a party’s liability for past conduct”; (2) “impair[s] rights a party possessed when he acted”; or (3) “impose[s] new duties with respect to transactions already completed.”; *Landgraf*, 511 U.S. at 280.

<sup>84</sup> *Mobile Relay Assocs.*, 457 F.3d at 11 (citations and quotations omitted).

<sup>85</sup> *Id.*

<sup>86</sup> *U.S. Airwaves*, 232 F.3d at 233.

<sup>87</sup> *Mobile Relay Assocs.*, 457 F.3d at 11.

<sup>88</sup> *Landgraf*, 511 U.S. at 280. See *NCTA*, 567 F.3d at 670 (Commission rule banning exclusivity agreements between cable companies and owners of apartment buildings “impaired the future value of past bargains but has not rendered past actions illegal or otherwise sanctionable”).

<sup>89</sup> *Landgraf*, 511 U.S. at 280.

<sup>90</sup> See, e.g., *DIRECTV*, 110 F.3d at 825-26 (previous Commission decision providing that reclaimed channels would be distributed pro rata among remaining permittees did not give petitioners the “right” to any specific channel; petitioners may reasonably have expected that they would receive a pro rata portion of reclaimed channels but a new rule is not retroactive “merely because it ... upsets expectations based on prior law”).

deadline for participating in the New York auction that auction winners could be subject to any additional requirements that are adopted for CAF Phase II auction recipients.<sup>91</sup> Similarly, the clarifications do not “impose new duties with respect to transactions already completed.”<sup>92</sup> Testing in accordance with the ITU P.800 standard is an ongoing compliance requirement that applies throughout the 10-year support term. The clarifications apply to testing that occurs prospectively. The *Performance Measures Order* did not impose “new duties” on testing that predated it.

30. At most, these clarifications arguably “‘upset[] expectations based on prior law’”<sup>93</sup> or “‘impair[] the future value of past bargains.’”<sup>94</sup> Such actions are secondarily, not primarily, retroactive and will be upheld if “reasonable, *i.e.*, if [they are] not arbitrary or capricious,”<sup>95</sup> both “in substance and in being made retroactive.”<sup>96</sup> The D.C. Circuit has explained that this requires “agencies [to] balance the harmful ‘secondary retroactivity’ of upsetting prior expectations or existing investments against the benefits of applying their rules to those preexisting interests.”<sup>97</sup> For the reasons discussed below, we conclude that our action was reasonable.

31. Our clarifications, including the decision that high-latency providers implementing the ITU P.800 standard must perform a conversation-opinion test, was necessary to achieve the Commission’s goal of ensuring that high-latency providers offer “quality voice service” throughout the 10-year support term.<sup>98</sup> As explained above, we reaffirm our conclusion that the other testing option provided in the ITU P.800 standard (the listening opinion test) is not designed for a two-way voice service.<sup>99</sup> Thus, allowing high-latency providers, including the NY Broadband Program winners, to

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<sup>91</sup> *New York Waiver Order*, 32 FCC Rcd at 994 para. 71; *see also id.* at 978, para. 26 (“[T]he Commission will maintain control over the funds at all times . . . by ensuring that the recipients are qualified to meet the obligations and individually authorizing the recipients . . . [and] by requiring the recipients to comply with the same level of oversight as all other Connect America Phase II recipients.”).

<sup>92</sup> *Landgraf*, 511 U.S. at 280; *see Celtronix*, 272 F.3d at 588-89 (the “transaction” to focus on is the conduct subject to the new rule, not the initial issuance of an authorization at auction); *NCTA*, 567 F.3d at 670 (a ban on existing exclusive contracts entered into before the Commission’s Order “alter[ed] only the present situation”); *see also Chemical Waste Management v. EPA*, 869 F.2d 1526, 1536 (D.C. Cir. 1989) (“It is often the case that a business will undertake a certain course of conduct based on the current law, and will then find its expectations frustrated when the law changes. This has never been thought to constitute retroactive lawmaking, and indeed most economic regulation would be unworkable if all laws disrupting prior expectations were deemed suspect.”).

<sup>93</sup> *DIRECTV*, 110 F.3d at 826 (quoting *Landgraf*, 511 U.S. at 280). For example, Hughes argues that applying to NY Broadband Program auction winners the clarifications subsequently adopted in the *Performance Measures Order* will make it difficult or impossible for satellite providers to comply with the performance requirements in the future. *See Hughes Dec. 7, 2018 Ex Parte* at 5-6. *See also Hughes PFR* at 2, 3-4. As a threshold matter, we dispute Hughes’ assertion that the clarifications adopted in the *Performance Measures Order* will make it impossible for satellite providers to comply. *See supra* para. 15.

<sup>94</sup> *NCTA*, 567 F.3d at 670.

<sup>95</sup> *Mobile Relay Assocs.*, 457 F.3d at 11 (citations and quotations omitted).

<sup>96</sup> *U.S. Airwaves*, 232 F.3d at 233.

<sup>97</sup> *NCTA*, 567 F.3d at 670.

<sup>98</sup> *See supra* para. [11]; *see also CAF Phase II Auction Order*, 31 FCC Rcd 5949, para. 33.

<sup>99</sup> *See Performance Measures Order*, 33 FCC Rcd at 6525, para. 44 (“[L]istening-opinion tests would not suffice to demonstrate a high-quality consumer voice experience. Latency only minimally affects participants’ experiences and evaluations in listening-opinion tests, which involve passive listening to audio samples. However, in the *USF/ICC Transformation Order*, the Commission required ‘ETCs to offer sufficiently low latency to enable use of real-time applications, such as VoIP.’ Unlike a listening-opinion test, in a conversation-opinion test, two participants actively participate in a conversation. The back-and-forth of conversations highlights delay, echo, and other issues caused by latency in a way that one-way, passive listening cannot.”).

comply only with a listening opinion test would undermine the Commission’s goal of ensuring that support recipients provide quality voice service.<sup>100</sup> Applying the clarifications adopted in the *Performance Measures Order* to the subsequent CAF Phase II auction winners but not to the previous NY Broadband Program winners would mean that residents of New York would be in jeopardy of not receiving quality voice service from high-latency providers. We find no justification for subjecting the residents of New York to second-class service, and the Commission specifically declined to do so in the *New York Waiver Order*.

32. To be sure, we acknowledge Hughes’ claim that it expected to use a listening opinion test despite its obligation to offer telephony service—i.e., a service that would allow Hughes’ customers to have two-way conversation. We find, however, that Hughes’ apparent expectations were unreasonable and are outweighed by the benefits noted above. First, the Commission stated *before* the deadline to participate in the NY Broadband Program auction that auction winners could be subject to any additional requirements that are adopted for CAF Phase II auction recipients.<sup>101</sup> Second, at the time of the NY Broadband Program auction, the decision in the *CAF Phase II Auction Order* to use the ITU P.800 standard was subject to a pending Petition for Reconsideration asking the Commission to clarify that the listener opinion test could not be used.<sup>102</sup> We agree with ADTRAN that Hughes had no legitimate expectation that it could continue to use a test that measures one-way transmissions to demonstrate its ability to support quality two-way services, especially when the issue was the subject of a pending reconsideration petition.<sup>103</sup> Thus, before the NY Broadband Program auction, Hughes was aware that the requirement to use the ITU-T P.800 protocol was subject to revision and that any revision would apply to NY Auction winners. On balance, we find that any upset expectations are outweighed by the benefits of ensuring that support recipients, including NY Broadband Program auction winners, provide quality voice service.<sup>104</sup> Accordingly, we conclude that applying to NY Broadband Program auction winners the clarifications subsequently adopted in the *Performance Measures Order* was reasonable, both “in substance and in being made retroactive.”<sup>105</sup>

#### IV. PROCEDURAL MATTERS

33. *Paperwork Reduction Act Analysis.* The Order on Reconsideration adopted herein contain new or modified information collection requirements. The Commission, as part of its continuing effort to reduce paperwork burdens, invites the general public and the Office of Management and Budget

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<sup>100</sup> As explained above, we reject Hughes’ claim that the clarifications adopted in the *Performance Measures Order* were not necessary to ensure quality voice service. See *supra* paras. 12-14.

<sup>101</sup> *New York Waiver Order*, 32 FCC Rcd at 994, para. 71; see also *id.* at 978, para. 26 (“[T]he Commission will maintain control over the funds at all times . . . by ensuring that the recipients are qualified to meet the obligations and individually authorizing the recipients . . . [and] by requiring the recipients to comply with the same level of oversight as all other Connect America Phase II recipients.”).

<sup>102</sup> See *NCTA*, 567 F.3d at 671 (upholding secondarily retroactive rule banning exclusive contracts and stating that “[l]egitimate expectations . . . were left largely undisturbed” because the lawfulness of exclusivity clauses had been under consideration by the Commission).

<sup>103</sup> See ADTRAN Comments at 4-5, 8.

<sup>104</sup> *U.S. Airwaves*, 232 F.3d at 236 (upholding secondarily retroactive revisions to the financing options available to winning auction bidders because the Commission “reasonably exercised its discretion to balance fairness to losing bidders with the needs of the market and with the public interest”); see *NCTA*, 567 F.3d at 670 (“Our case law does require that agencies balance the harmful ‘secondary retroactivity’ of upsetting prior expectations or existing investments against the benefits of applying their rules to those preexisting interests.”). See also *id.* at 670 (upholding secondarily retroactive rule banning exclusive contracts because the Commission balanced benefits against harms and determined that applying the rule retroactively was worth its costs).

<sup>105</sup> *U.S. Airwaves*, 232 F.3d at 233.

(OMB) to comment on the information collection requirements contained in this document, as required by the Paperwork Reduction Act of 1995, Public Law 104-13.

34. *Congressional Review Act.* The Commission will send a copy of this Order on Reconsideration to Congress and the Government Accountability Office pursuant to the Congressional Review Act.<sup>106</sup>

35. *Final Regulatory Flexibility Certification.* The Regulatory Flexibility Act of 1980, as amended (RFA),<sup>107</sup> requires agencies to prepare a regulatory flexibility analysis for rulemaking proceedings, unless the agency certifies that “the rule will not have a significant economic impact on a substantial number of small entities.”<sup>108</sup> The RFA generally defines “small entity” as having the same meaning as the terms “small business,” “small organization,” and “small governmental jurisdiction.”<sup>109</sup> In addition, the term “small business” has the same meaning as the term “small business concern” under the Small Business Act.<sup>110</sup> A small business concern is one which: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the Small Business Administration (SBA).<sup>111</sup>

36. The Order on Reconsideration above amends the *Performance Measures Order*. These revisions do not create any burdens, benefits, or requirements that were not addressed by the Final Regulatory Flexibility Analysis attached to the *Performance Measures Order*.<sup>112</sup> Therefore, we certify that the rule revisions adopted in this Order on Reconsideration will not have a significant economic impact on a substantial number of small entities.

37. The Commission will send a copy of the Order on Reconsideration, including a copy of this Final Certification, in a report to Congress pursuant to the Congressional Review Act.<sup>113</sup> In addition, the Order on Reconsideration will be sent to the Chief Counsel for Advocacy of the SBA, and will be published in the Federal Register.<sup>114</sup>

## V. ORDERING CLAUSES

38. Accordingly, IT IS ORDERED that, pursuant to the authority contained in sections 1-4, 5, 201-206, 214, 218-220, 251, 252, 254, 256, 303(r), 332, 403, and 405 of the Communications Act of 1934, as amended, and section 706 of the Telecommunications Act of 1996, 47 U.S.C. §§ 151-155, 201-206, 214, 218-220, 251, 256, 254, 256, 303(r), 403 and 405, sections 0.91 and 0.291 of the Commission’s rules, 47 CFR §§ 0.91, 0.291, and the delegations of authority in paragraph 170 of the *USF/ICC Transformation Order*, FCC 11-161, this Order on Reconsideration IS ADOPTED, effective thirty (30) days after publication of the text or summary thereof in the Federal Register, except for those rules and requirements involving Paperwork Reduction Act burdens, which shall become effective immediately

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<sup>106</sup> See 5 U.S.C. § 801(a)(1)(A).

<sup>107</sup> 5 U.S.C. § 601 *et seq.*

<sup>108</sup> 5 U.S.C. § 605(b).

<sup>109</sup> 5 U.S.C. § 601(6).

<sup>110</sup> 5 U.S.C. § 601(3) (incorporating by reference the definition of “small business concern” in Small Business Act, 15 U.S.C. § 632). Pursuant to 5 U.S.C. § 601(3), the statutory definition of a small business applies “unless an agency, after consultation with the Office of Advocacy of the Small Business Administration and after opportunity for public comment, establishes one or more definitions of such term which are appropriate to the activities of the agency and publishes such definition(s) in the Federal Register.” 5 U.S.C. § 601(3).

<sup>111</sup> Small Business Act, 15 U.S.C. § 632.

<sup>112</sup> See *Rate-of-Return Reform Order*, 31 FCC Rcd at 3286, App D.

<sup>113</sup> 5 U.S.C. § 801(a)(1)(A).

<sup>114</sup> 5 U.S.C. § 605(b).

upon announcement in the Federal Register of OMB approval. It is our intention in adopting these rules that if any of the rules that we retain, modify, or adopt herein, or the application thereof to any person or circumstance, are held to be unlawful, the remaining portions of the rules not deemed unlawful, and the application of such rules to other persons or circumstances, shall remain in effect to the fullest extent permitted by law.

39. IT IS FURTHER ORDERED that, pursuant to the authority contained in section 405 of the Communications Act of 1934, as amended, 47 U.S.C. § 405, and sections 0.331 and 1.429 of the Commission's rules, 47 CFR § 0.331 and 47 CFR § 1.429, the Petition for Clarification, or in the Alternative, Reconsideration filed by HUGHES NETWORK SYSTEMS, LLC on September 19, 2018 IS DENIED.

40. IT IS FURTHER ORDERED that, pursuant to the authority contained in section 405 of the Communications Act of 1934, as amended, 47 U.S.C. § 405, and sections 0.331 and 1.429 of the Commission's rules, 47 CFR § 0.331 and 47 CFR § 1.429, the Petition for Reconsideration filed by VIASAT, INC. on September 19, 2019 IS GRANTED IN PART and DENIED IN PART to the extent described herein.

41. IT IS FURTHER ORDERED that the Commission's Consumer and Governmental Affairs Bureau, Reference Information Center, SHALL SEND a copy of this Order on Reconsideration, including the Final Regulatory Flexibility Certification, to the Chief Counsel for Advocacy of the Small Business Administration.

42. IT IS FURTHER ORDERED that the Commission SHALL SEND a copy of this Order on Reconsideration to Congress and the Government Accountability Office pursuant to the Congressional Review Act, *see* 5 U.S.C. § 801(a)(1)(A).

FEDERAL COMMUNICATIONS COMMISSION

Kris Anne Monteith  
Chief  
Wireline Competition Bureau

Donald Stockdale  
Chief  
Wireless Telecommunications Bureau

Julius P. Knapp  
Chief Engineer  
Office of Engineering and Technology