



August 24, 2018

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

**Re: Connect America Fund, WC Docket No. 10-90**

Dear Ms. Dortch,

On July 12, representatives of Hughes Network Systems, LLC (“Hughes”) spoke by telephone separately with Jay Schwarz of Chairman Pai’s office and Amy Bender of Commissioner O’Rielly’s office regarding the setting of voice performance standards for satellite networks.<sup>1</sup> There was another telephone call with Jay Schwarz of Chairman Pai’s office a few days later on July 18, 2018.<sup>2</sup> These Ex Partes were calling into question the Bureau’s decision<sup>3</sup> to require CAF recipients in the higher latency tier to meet live “conversation-opinion” tests.

I have been involved in various aspects of the design, implementation, and testing of telecommunications systems over the last 30 years - including satellite systems. Implementation of the testing methodology put forth by Hughes would serve to simply mask voice quality issues, resulting in a less-capable broadband service for those rural consumers served by and dependent upon supported networks.

Voice conversations necessarily involve two or more participants being able to communicate back and forth. Because of this, performance testing should be conducted in a manner that measures the interactive two-way communication qualities of the service. The overall quality of interactive, voice communications service is impacted by latency. The

---

<sup>1</sup> Letter from Jennifer A. Manner, Hughes, to Marlene H. Dortch, FCC, WC Docket No. 10-90, dated July 16, 2018 ([https://ecfsapi.fcc.gov/file/10716214546353/Hughes%20CAF%20Metrics%20ex%20parte%20\(7-12-18\).pdf](https://ecfsapi.fcc.gov/file/10716214546353/Hughes%20CAF%20Metrics%20ex%20parte%20(7-12-18).pdf))

<sup>2</sup> Letter from Jennifer A. Manner, Hughes, to Marlene H. Dortch, FCC, WC Docket No. 10-90, dated July 19, 2018 (<https://ecfsapi.fcc.gov/file/10719807702516/Hughes%20OCH%20CAF%20Metrics%20ex%20parte%207-18-18.pdf>)

<sup>3</sup> Connect America Fund, Order, DA 18-710 (WCB, WTB, and OET, rel. July 6 2018)

perception of quality can be measured using a subjective rating called the Mean Opinion Score (MOS). MOS scores are generally categorized and defined in ITU-T Recommendation P.800 as depicted in Table 1.<sup>4</sup>

MOS	Quality	Impairment
5	Excellent	Imperceptible
4	Good	Perceptible, but not Annoying
3	Fair	Slightly Annoying
2	Poor	Annoying
1	Bad	Very Annoying

Table 1: MOS Score Definition

The ITU-T Recommendation P.800 provides for two alternative testing procedures. These are the conversation-opinion test and the listening-opinion test. The ITU-T Recommendation P.800 states that the conversation-opinion test is intended to reproduce “the actual service conditions experienced by telephone customers.”<sup>5</sup> The listening-opinion tests are intended for testing unidirectional systems, such as “broadcast circuits, public address systems and recorded announcement systems.”<sup>6</sup> This is not the correct test to perform if the broadband service is intended to be used for interactive applications such as voice or video conferencing.

By arguing for a “listening-opinion” rather than the “conversation-opinion” test, would be the equivalent 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. Just as a flight-worthy plane must be able to both take off and land successfully, a network supported by federal dollars and essential for the transaction of business, conversations with family, and communications with public safety must have high-quality voice service that scores well in the “conversation-opinion” test. Anything less relegates users of rural networks in high-cost areas to frustratingly less usable and less reliable services.

---

<sup>4</sup> ITU-T, P.800, SERIES P: TELEPHONE TRANSMISSION QUALITY Methods for objective and subjective assessment of Quality, Methods for Subjective Determination of Transmission Quality, (08/96), pg. 18.

<sup>5</sup> Ibid, pg. 3

<sup>6</sup> Ibid, pg. 4

Hughes also believes that requiring performing conversational-opinion tests is burdensome and inconsistent with the Commission being “technology neutral”.<sup>7</sup> In making these claims, Hughes is not asking for the Commission to be “*technology* neutral” but rather “*quality* neutral.” Technology neutral regulation prevents the preference of one type of technology over another for an equivalent service. By asking the Commission to treat a *high* latency service similar to a *low* latency service and to utilize tests that mask latency effects, is in effect asking for “quality neutrality,” regardless of technology. Consumers would suffer if the Commission were to allow support to be directed toward providers offering a lower quality broadband service when there are other providers willing to offer higher quality services.

Hughes also states that the requirement for this testing is not consistent with the 80/80 compliance standard for broadband speeds.<sup>8</sup> The 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>9</sup> This is simply another red herring put forth by Hughes.

As discussed in previous filings, “. . . a small amount of latency may just be an annoyance to the user; however excessive latency will negatively impact public safety, healthcare, education, and commercial services.”<sup>10</sup> Latencies that are 20 times higher than a typical terrestrial broadband service are clearly excessive. As network latency increases, the usefulness of a broadband network decreases. Network latency not only makes it difficult for the consumer to fully participate in today’s global economy but also ensures that they will be second-class broadband citizens. The Commission should reject the suggestion of “quality neutrality” put forth by Hughes and not allow inferior broadband services the same

---

<sup>7</sup> Letter from Jennifer A. Manner, Hughes, to Marlene H. Dortch, FCC, WC Docket No. 10-90, dated July 16, 2018, Page 2.

<sup>8</sup> 2018 FCC Performance Testing Standard, WC Docket No. 10-90, July 16, 2018, Paragraph 51.

<sup>9</sup> 2016 Measuring Broadband America Fixed Broadband Report, pp. 20-21  
(<http://data.fcc.gov/download/measuring-broadband-america/2016/2016-Fixed-Measuring-Broadband-America-Report.pdf>)

<sup>10</sup> Latency Considerations for Satellite Broadband, Vantage Point Solutions, May 2017,



opportunities as high-quality broadband services. The Commission should not allow latest attempt to yet again weaken latency standards and enable the provision of substandard services to consumers that or frustrate their attempts to engage the voice service that is supported by universal service funds under law.

Sincerely,

Larry D. Thompson  
Chief Executive Officer