



August 28, 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 6, 2018, the FCC released an order defining new rules for carriers to measure the speed and latency performance of supported broadband networks (“Performance Testing Order”).<sup>1</sup> This order established broadband testing requirements for Connect America Fund (“CAF”) high-cost universal service support, including price cap carriers, rate-of-return carriers, rural broadband experiment (“RBE”) support recipients, Alaska Plan carriers and CAF Phase II auction winners.<sup>2</sup>

Vantage Point Solutions and myself have been involved in designing, deploying, and testing hundreds of broadband networks over the last 30 years. We applaud the Federal Communications Commission (“Commission”) for the increased accountability for recipients of high-cost universal support. There are, however, a few areas of the Performance Testing Order that we feel should be clarified or revised. These are:

1. The Appropriate Endpoints (both initiation and termination) of the Broadband Circuit Under Test
2. The Timing of Performance Test Initiation
3. The Elimination of Test Results Greater than 150% of the Advertised Speed

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<sup>1</sup> Connect America Fund, Order DA-18-710A1 (WCB, WTB, and OET, rel. July 6 2018), (“Performance Testing Order”)

<sup>2</sup> Ibid, ¶ 1

## 1. Performance Testing Endpoints

There are technical concerns regarding both the point within the customer premises where the performance tests are initiated and the point at which the tests are terminated. The Performance Testing Order should be clarified or modified to address these concerns.

### *Point of Initiation in Customer Premises*

It is unclear in the Performance Testing Order where the testing should be initiated within the customer premises. The carrier could use a variety of network locations to initiate these tests, including locations that could achieve results that are not representative of the actual performance experienced by the end user customer. To accurately measure the performance of the broadband service, it is important for the testing to be performed on the customer side of the network equipment and on the port used to deliver the broadband service to the customer.

In a previous filing, Vantage Point discussed the impacts to speed on gigabit connections due to the port on the router or broadband provider's Optical Network Terminal ("ONT").<sup>3</sup> The ONT has full access to all the capacity available on the fiber, which could be 2.5Gbps, 10Gbps, or more. However, the broadband being delivered to the customer is often limited to less than 1 Gbps simply due to the port on the broadband provider's equipment used to deliver the service. The test results for a wireless or wireline network could be quite different if the tests were initiated on the network side of the port compared to what is experienced by the end user customer. If testing were performed on the network side of the customer interface, it would be difficult to ensure that the test was being performed on the network path actually used by the customer and not on a separate set of wires, a different carrier on the same wires, or a different frequency spectrum.

### *Point of Termination at IXP or Elsewhere*

It is reasonable for the Commission to require that the performance testing be performed from the end user to the farthest upstream location over which the broadband provider has reasonable control.<sup>4</sup> Larger carriers may have direct access to the Internet

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<sup>3</sup> Broadband Speed Characteristics, June 2018 ([https://www.ntca.org/sites/default/files/federal-filing/2018-06/06.18.18PerformanceTestingJune152018%2CDk.No\\_.10-90.pdf](https://www.ntca.org/sites/default/files/federal-filing/2018-06/06.18.18PerformanceTestingJune152018%2CDk.No_.10-90.pdf))

<sup>4</sup> Performance Testing Order, ¶ 19

Exchange Points (“IXPs”)<sup>5</sup> as defined by the Commission. However, when a small Rural Local Exchange Company (“RLEC”) purchases Internet capacity from their next tier Internet Service Provider (“ISP”), this next tier ISP often purchases capacity from a higher tier ISP. The Internet traffic from an RLEC may go through two or more ISPs before reaching one of the Commission’s designated IXPs. Since the RLEC has control over the broadband capacity in their own network and is in control of the amount of capacity they purchase from their ISP, it seems reasonable that they should be required to test to their next tier ISP. However, they have little or no control over how much capacity the RLEC’s ISP purchases from their next-tier ISP or any other ISP upstream from the ISP to which they are directly connected. We recommend that the performance testing for an RLEC allow the use of any speed test server located at or which can be reached by passing through the broadband provider’s next tier ISP rather than one of the Commission’s designated IXPs.

## 2. Timing of Performance Test Initiation

The Commission recognizes that speed testing will have an impact on the network.<sup>6</sup> The Performance Testing Order states, “For speed testing, we require providers to start separate download and upload speed tests at the beginning of each test hour window.”<sup>7</sup> Performing speed testing in this fashion would result in a significant burden on the speed test servers and create such a high network load that neither the uplink nor the downlink test results would be representative of what a customer would normally achieve.

For example, there may be five broadband providers that were successful in the CAF Phase II Auction for areas where they are providing 1 Gbps service. If each provider is served by the same ISP (or same network such as a statewide or regional network) and are performing speed testing at these 50 customer locations on the same day, it would result in 250 locations each attempting to get 1 Gbps capacity the same exact time. For these tests to be successful, the networks carrying the aggregated traffic must have 250 Gbps of capacity available all the way to the Commission’s designated IXP. As the traffic is aggregated at the shared network elements between their ISP and the Commission’s designated IXPs, the circuit capacities could quickly become exhausted. Even if enough network capacity existed in the network, the speed

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<sup>5</sup> *ibid*, ¶ 20

<sup>6</sup> *ibid*, ¶ 28

<sup>7</sup> *ibid*

test servers could quickly become overloaded. Even if the speed test servers each have 10 Gbps interfaces, the traffic would have to be distributed across 25 different servers for just these five providers.

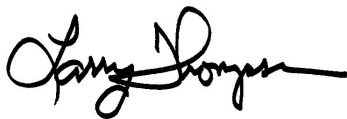
To help ensure that the performance test results will be more representative of the performance experienced by the end user customer, the Commission should allow the speed tests for each broadband provider to be distributed within each of the testing hours in a way that minimizes network impact and maximizes the accuracy of the test results for the individual user.

### 3. Elimination of Tests Results Greater Than 150% of Advertised Speed

Although less significant than the previously mentioned items, we are nonetheless concerned that the Commission's plan to eliminate tests that are 150% of the advertised speed<sup>8</sup> could potentially eliminate valid data points from the analysis. This is because some companies significantly over provision their services to ensure that customers have a high probability of achieving the advertised speed regardless of network conditions, packet size, etc. The 150% should capture most of these circumstances but not all. There are also some companies that do not advertise a speed at all. If the Commission's concern is to eliminate outliers, then a method such as the elimination of points beyond a defined number of standard deviations should be considered. A confidence interval of more than 95% could be achieved within two standard deviations and more than 99% with three.

Thank you for your consideration of these important matters.

Sincerely,



Larry D. Thompson  
Chief Executive Officer

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<sup>8</sup> Ibid, Footnote 145