



6712-01

FEDERAL COMMUNICATIONS COMMISSION

47 CFR Part 54

[WC Docket No. 10-90; FCC 19-104]

Connect America Fund

AGENCY: Federal Communications Commission.

ACTION: Final rule.

SUMMARY: In this document, the Federal Communications Commission (Commission) reviews performance measures established by the Wireline Competition Bureau (WCB), the Wireless Telecommunications Bureau, and the Office of Engineering and Technology (collectively the Bureaus) for recipients of Connect America Fund (CAF) high-cost universal service support to ensure that those standards strike the right balance between ensuring effective use of universal service funds while granting the flexibility providers need given the practicalities of network deployment in varied circumstances.

DATES: Effective [INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

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SUPPLEMENTARY INFORMATION: This is a summary of the Commission's Order on Reconsideration in WC Docket No. 10-90; FCC 19-104, adopted on October 25, 2019 and released on October 31, 2019. The full text of this document is available for public inspection during regular business hours in the FCC Reference Center, Room CY-A257, 445 12th Street SW, Washington, DC 20554 or at the following Internet address: <https://docs.fcc.gov/public/attachments/FCC-19-104A1.pdf>

I. INTRODUCTION

1. The Commission has long recognized that “[a]ll Americans [should] have access to broadband that is capable of enabling the kinds of key applications that drive the Commission’s efforts to achieve universal broadband, including education (e.g., distance/online learning), health care (e.g., remote

health monitoring), and person-to-person communications (e.g., Voice over Internet Protocol (VoIP) or online video chat with loved ones serving overseas).” To that end, the Commission has invested significant Universal Service Fund support for the deployment of broadband-capable networks in high cost, rural areas.

2. But only fast and responsive networks will allow Americans to fully realize the benefits of connectivity. That is why the Commission requires recipients of universal service support in high cost areas to deploy broadband networks capable of meeting minimum service standards. These standards protect taxpayers’ investment and ensure that carriers receiving this support deploy networks that meet the performance standards they promised to deliver to rural consumers. At the same time, the Commission recognizes that each carrier faces unique circumstances, and that one set of prescriptive rules may not make sense for every one of them. To accommodate this practical reality, the Commission’s rules provide flexibility, taking into account the operational, technical, and size differences among providers when establishing minimum standards, to ensure that even the smallest rural carriers can meet testing requirements without facing excessive burdens.

3. In the Order on Reconsideration, the Commission reviews performance measures established by the Bureaus for recipients of CAF high-cost universal service support to ensure that those standards strike the right balance between ensuring effective use of universal service funds while granting the flexibility providers need given the practicalities of network deployment in varied circumstances. Several petitions for reconsideration and applications for review of the Performance Measures Order, 83 FR 42052, August 20, 2018, propose changes to these performance measures. Here, the Commission rejects the proposed changes where it finds that the Bureaus’ approach strikes the right balance. Where the Commission finds that the Bureaus’ approach does not—for example, where it concludes that greater flexibility is warranted than was offered under the Bureaus’ original methodology—the Commission adjusts its rules accordingly. Finally, the Commission clarifies the Bureaus’ approach where doing so will help resolve stakeholder confusion.

II. DISCUSSION

4. In the Order on Reconsideration, the Commission reexamines each of the described performance measure requirements in this document. As a result, the Commission adopts several modifications. The Commission believes these changes will alleviate concerns expressed by carriers by increasing the time for carriers to meet certain deadlines and further minimizing the costs associated with compliance, yet still ensure that carriers meet their performance obligations. In short, the refinements to the Bureau's approach adopted in the Performance Measures Order will further the overarching goal of the *Performance Measures Order*; namely, to ensure that carriers deliver broadband services with the speed and latency required while providing flexibility to enable carriers of all sizes to choose how to conduct the required performance testing in the manner most appropriate for each individual carrier.

5. Under the Performance *Measures Order*, all high-cost support recipients serving fixed locations must perform speed and latency tests from the customer premises of an active subscriber to a remote test server located at or reached by passing through an FCC-designated Internet Exchange Point (IXP). In the *USF/ICC Transformation Order*, 76 FR 73830, November 29, 2011, the Commission decided that speed and latency should be measured on each eligible telecommunications carriers (ETCs) access network from the end-user interface to the nearest Internet access point, i.e., the Internet gateway, which is the closest peering point between the broadband provider and the public Internet for a given consumer connection. Subsequently, in the *CAF Phase II Price Cap Service Obligation Order*, 78 FR 70881, November 27, 2013, WCB stated that latency should be tested to an IXP, defined as occurring in any of ten different U.S. locations, almost all of which are locations used in the MBA program because they are geographically distributed major peering locations. The Bureaus expanded the list to permit testing to six additional metropolitan areas to ensure that most mainland U.S. locations are within 300 miles of an FCC-designated IXP and that all are within approximately 500 air miles of one. Further, the Bureaus permitted providers to use any FCC-designated IXP for testing purposes, rather than limiting testing to the provider's nearest IXP. Providers serving non-contiguous areas greater than 500 air miles from an FCC-designated IXP were also permitted to conduct testing between the customer premises and

the point at which traffic is aggregated for transport to the continental U.S.

6. The Commission agrees with the Bureaus that the speed and latency of networks of carriers receiving support through the various high-cost support mechanisms should be tested between the customer premise of an active subscriber and an FCC-designated IXP. This approach is consistent with the Commission's determination in the *USF/ICC Transformation Order* that "actual speed and latency [must] be measured on each ETCs access network from the end-user interface to the nearest Internet access point." Measuring the performance of a consumer's connection to an IXP better reflects the performance that a carrier's customers experience. As the Commission observed when it first adopted performance measures for CAF Phase II model-based support recipients, "[t]esting . . . on only a portion of the network connecting a consumer to the Internet core will not show whether that customer is able to enjoy high-quality real-time applications because it is network performance from the customer's location to the destination that determines the quality of the service from the customer's perspective."

7. The Commission therefore disagrees with those commenters arguing that it should require testing over a shorter span. For example, NTCA seeks modification of the testing requirements to account for performance only on "portions of the network owned by the USF recipient and the next-tier ISP from which that USF recipient procures capacity directly." NTCA argues that requiring testing to an FCC-designated IXP imposes liability on a carrier for conditions beyond its control and violates the Act by applying obligations to parts of the network that are not supported by USF funding. Alternatively, NTCA requests that the Commission provide a "safe harbor" to protect a carrier from off-network issues that affect its test measurements. WTA similarly contends that testing to an FCC-designated IXP makes carriers responsible for portions of the connection over which they have no control. WTA instead proposes a two-tiered framework consisting of a network-only test for purposes of high-cost compliance and customer-to-IXP testing to respond to customer complaints, with unresolved network-only problems being subject to non-compliance support reductions. Finally, Vantage Point seeks clarity on the initiation point for performance testing within the customer premises, and contends that the endpoint for testing should be at or reached by passing through a carrier's next tier ISP.

8. The Commission disagrees with petitioners that testing to an FCC-designated IXP, rather than the edge of a carrier's network, makes a carrier responsible for network elements it does not control, and the Commission rejects testing only on a carrier's own network as inadequate. As the Bureaus explained, carriers—even smaller ones—do have some influence and control over the type and quality of Internet transport they purchase. The Commission expects a carrier to purchase transport of a sufficient quality that enables it to provide the requisite level of service expected by consumers and required by the Commission's rules. However, in the event a carrier fails to meet its performance obligations because the only transport available would demonstrably degrade the measured performance of the carrier's network, the carrier can seek a waiver of the performance measures requirements. The Commission is similarly unpersuaded by WTA's two-tiered testing proposal. Adopting WTA's proposal to conduct its required tests over only half of the full testing span would only provide the Commission with insight into the customer experience on half of the network between the customer and the IXP. Given that the Commission's aim is to ensure that customers are able to enjoy high-quality real-time applications, it declines to adopt WTA's proposed approach.

9. Finally, the Commission provides additional clarity on both the initiation point and endpoint for testing. As the Commission has noted in this document, one of the chief purposes for implementing performance requirements is to ensure that customers are receiving the expected levels of service that carriers have committed to providing. Testing from any place other than the customer side of any carrier network equipment used in providing a customer's connection may skew the testing results and not provide an accurate reflection of the customer's broadband experience. As Vantage Point notes, testing in this manner would make it "difficult to ensure that the test was being performed on the network path actually used by the customer." Thus, the Commission clarifies that testing should be conducted from the *customer side* of any network equipment that is being used.

10. *Definition of FCC-designated Internet Exchange Point.* Given the Commission's commitment to testing the performance of connections between consumers and FCC-designated IXPs, it also takes this opportunity to clarify which facilities qualify as FCC-designated IXPs for purposes of

performance testing.

11. USTelecom, ITTA, and WISPA request clarification that ETCs are permitted to use “the nearest Internet access point,” as specified in the *USF/ICC Transformation Order*, which may not necessarily be a location specified in the *Performance Measures Order*. They also seek clarification that ETCs may test to servers that are within the provider’s own network (i.e., on-net servers). In subsequent filings, the petitioners suggest that there should be a criteria-based approach to defining the testing endpoint. Specifically, they propose that testing occur “from the end-user interface to the first public Internet gateway in the path of the CAF-supported customer that connects through a transitive Internet Autonomous System,” (ASN) and “that the Commission establish a safe harbor where the transitive Internet AS which the gateway hosts includes one or more router(s) that advertise(s) [ASN] organizations that are listed on the Center for Applied Internet Data Analysis (CAIDA) ‘AS Organization Rank List.’” The petitioners propose that testing occurring through a “safe harbor” ASN “would be considered valid without further inquiry.”

12. The Commission concludes that the *Performance Measures Order*’s designation of certain metropolitan areas as qualifying IXPs is too ambiguous. It is not clear where the boundaries of a designated IXP metropolitan area begin and end. Thus, drawing on the petitioners’ proposal, the Commission now provides a revised definition of FCC-designated IXP that is more specific and better designed to account for the way Internet traffic is routed. For testing purposes, the Commission defines an FCC-designated IXP as any building, facility, or location housing a public Internet gateway that has an active interface to a qualifying ASN. Such a building, facility, or location could be either within the provider’s own network or outside of it. The Commission uses the term “qualifying ASN” to ensure that the ASN can properly be considered a connection to the public Internet. The Commission notes that in the *USF/ICC Transformation Order*, it finds that the Internet gateway is the “peering point between the broadband provider and the public Internet” and that public Internet content is “hosted by multiple service providers, content providers and other entities in a geographically diverse (worldwide) manner.” The criteria the Commission uses to determine FCC-designated IXPs are designed to ensure that the peering

point is sufficiently robust such that it can be considered a connection to the public Internet and not simply another intervening connection point. The Commission designates 44 major North American ASNs using CAIDA's ranking of Autonomous Systems and other publicly available resources as "safe harbors." The Commission directs the Bureaus to update this list of ASNs periodically using the CAIDA ranking of ASNs, PeeringDB, and other publicly available resources. Providers may test to a test server located at or reached by passing through any building, facility, or location housing a public Internet gateway that has an active interface to one of these qualifying ASNs or may petition the Bureaus to add additional ASNs to the list. The Bureaus will determine whether any ASN included in a carrier petition is sufficiently similar to qualifying ASNs that it should be added to the list of qualifying ASNs.

13. The Bureaus also established a daily testing period for speed and latency tests, requiring carriers to conduct tests between 6:00 p.m. and 12:00 a.m. local time, including weekends. The testing window the Bureaus adopted reflects a slight expansion of the testing window used for the MBA. The Bureaus reasoned that MBA data indicated a peak period of Internet usage every evening but noted that they would revisit this requirement periodically "to determine whether peak Internet usage times have changed substantially."

14. Petitioners and commenters urge the Commission to reconsider the daily test period requirement to account for the usage patterns of rural consumers, as well as the conditions and characteristics of rural areas. WTA notes that the MBA data cited by the Bureaus likely reflect the usage patterns of urban consumers, rather than consumers in rural areas that "are typically making personal and business use of their household Internet connections throughout the day." WTA contends that there is likely to be increased congestion on rural networks during the time period adopted by the Bureaus, potentially resulting in an inaccurate or unrepresentative testing of the carrier's service. WTA also argues that mandating testing during evening hours and weekends requires rural carriers to adjust their regular daytime schedule, creating staffing and financial hardships and potentially preventing them from responding to other customer service issues. ITTA supports this point, noting that "evening and weekend test hours require RLECs to re-schedule one or more technicians from their regular daytime maintenance

and installation duties and pay them premium or overtime wages.” ITTA also challenges the expansion of the daily test period from 7 p.m. to 11 p.m. to 6 p.m. to 12 a.m., and requests flexibility as to the specific hours that testing may be conducted.

15. The Commission declines to revisit the daily testing period at this time. WTA provides no data to support its claim that rural consumers are more active users of broadband service during daytime hours than urban consumers. Moreover, the Commission’s review of MBA data from more rural areas indicates that these areas have similar peak periods to urban areas. As the Commission has stated many times, a primary goal for universal service is to ensure that customers in rural areas receive the same level of service as those in urban areas. By establishing the same testing window for urban and rural areas, the Commission can confirm that consumers in rural areas are not receiving substandard service as compared to consumers in urban areas during the same time periods. Additionally, WTA’s concern that testing during the peak period may degrade a consumer’s broadband experience is unfounded. As the Commission previously observed, the small amount of data required for speed testing will have no noticeable effect on network congestion. The Commission reminds carriers that it provides them the flexibility to choose whether to stagger their tests over the course of the testing period, so long as they do not violate any other testing requirements.

16. The Commission also disagrees with WTA and ITTA that the current daily testing period will require rural carriers to devote additional personnel hours to implement the Commission’s performance testing requirements. Once the testing regime is implemented and carriers have installed the necessary technology and software to test the speed and latency of their networks on a routine basis, the Commission does not anticipate that extensive staffing will be required to monitor the testing process. Because the technological testing options that the Commission has allowed carriers to use are all relatively automated, carriers should not have to adjust schedules to ensure staffing during evenings and weekends. Additionally, the Commission notes that the Bureaus expanded the testing period from 7 p.m. to 11 p.m. to 6 p.m. to 12 a.m. based on several comments from parties that requested a longer testing period. Adding one additional hour on both the front and back end of the testing period allows a carrier’s

testing to capture the ramp up and ramp down periods before and after peak time, providing a more accurate picture of whether customers are receiving the required level of service. The Commission also reminds parties that the Bureaus committed to revisiting periodically the daily testing window to ensure that the established hours continue to reflect the usage habits of consumers.

17. The Bureaus required a specified number of speed tests during each testing window. In particular, the *Performance Measures Order* required a minimum of one download test and one upload test per testing hour at each subscriber test location. Providers were required to start separate download and upload speed tests at the beginning of each test hour window, and, after deferring a test due to cross-talk (e.g., traffic to and from the consumer's location that could impact performance testing), providers were required to reevaluate whether the consumer load exceeds the cross-talk threshold every minute until the speed test can be run or the one-hour test window ends.

18. In their Petition for Reconsideration, USTelecom, ITTA, and WISPA request clarification that recipients are afforded flexibility in commencing hourly tests. They argue that “[i]t is not clear from the *Performance Measures Order*. . . whether ‘the beginning’ of a test hour window requires a recipient to commence testing at the top of the hour, or whether testing must commence for all test subscribers at exactly the same time.” The petitioners state that carriers should only be required to complete the test within the hour, and they should be able to retry tests as frequently as their systems allow until a successful test is administered, rather than retrying deferred tests every minute. Noting that “there should be no practical difference as to whether testing occurs at the top, middle, or closer to [the] end of a testing window,” NTCA, NRECA, and UTC support the petitioners’ request that “the Commission reconsider the discrete and specific times at which testing is to be conducted within each hour.” Vantage Point likewise proposes that the Commission permit carriers to distribute speed tests within testing hours in a way that minimizes network impact; otherwise, Vantage Point asserts, requiring all speed testing to start at the beginning of each hour would significantly burden test servers such that test results would not be representative of customers’ normal experience.

19. The Commission clarifies that providers do not have to begin speed tests at the beginning

of each test hour, as petitioners suggest. In particular, the Commission agrees with Vantage Point that providing greater flexibility in this regard will further minimize the impact of any potential burden on the test servers during speed testing. However, to ensure that there is enough data on carriers' speed performance, providers must still conduct and report at least one download test and one upload speed test per testing hour at each subscriber test location, with one exception. A carrier that begins attempting speed tests within the first fifteen minutes of a testing hour, and repeatedly retries and defers the test at one-minute intervals due to consumer load meeting the adopted cross-talk thresholds (i.e., 64 Kbps for download tests or 32 Kbps for upload tests), may report that no test was successfully completed during the test hour because of cross-talk. A provider that does not attempt a speed test within the first 15 minutes of the hour and/or chooses to retry tests in greater than one-minute intervals must, however, conduct and report a successful speed test for the testing hour regardless of cross-talk. Although this approach continues to differ slightly from MBA practice, the Commission believes that it minimizes the possibility of network congestion at the beginning of the testing hour while ensuring that it will have access to sufficient testing data.

20. The *Performance Measures Order* established specific test intervals within the daily test period for latency testing, requiring carriers to conduct “a minimum of one discrete test per minute, i.e., 60 tests per hour, for each of the testing hours, at each subscriber test location, with the results of each discrete test recorded separately.” Recognizing that cross-talk could negatively affect the test results, the Bureaus provided flexibility for carriers to postpone a latency test in the event that the consumer load exceeded 64 Kbps downstream and to reevaluate the consumer load before attempting the next test.

21. Several parties express concern with these requirements and request reconsideration of the latency testing framework. USTelecom, ITTA, and WISPA jointly contend that the Bureaus failed to provide adequate notice for the frequency of latency testing and did not justify departing from the MBA practice of combining speed and latency testing under a unified framework. These parties further argue that requiring latency testing once per minute will be administratively burdensome for carriers by preventing them from combining the instructions for testing into a single process and potentially

overloading and disrupting some testing methods. Instead, USTelecom, ITTA, and WISPA propose that the number of latency tests should be reduced to match the frequency of speed testing. Midcontinent also supports aligning the frequency of speed and latency testing requirements.

22. AT&T contends that testing once per minute “is unnecessary and arbitrary and capricious” and likewise argues that the Commission should permit carriers to test latency only once per hour. AT&T supports its proposal by providing internal data purporting to demonstrate no material difference between testing latency once per minute versus testing once per hour. As a result, AT&T proposes that the Commission require a minimum of one latency test per hour, but provide flexibility to allow carriers to test more frequently if they desire. ITTA concurs with AT&T’s proposed approach.

23. Conversely, NTCA, NRECA, and UTC support the latency testing framework adopted by the Bureaus. These parties observe that aligning the frequency of speed and latency tests would “risk undermining the Commission’s statutory mandate to ensure reasonably comparable services in rural and urban areas” because speed does not require as frequent testing as latency in order to demonstrate compliance. In response, USTelecom, ITTA, and WISPA again argue that the Bureaus failed to adequately address the Administrative Procedure Act’s notice obligations or present any legal or factual basis for requiring substantially more latency tests than speed tests.

24. The Commission declines to revise the determination of the Bureaus that carriers must conduct latency testing once per minute. Regarding parties’ procedural arguments, the Commission notes that, in the two Public Notices seeking comment on the performance measures, the Bureaus specifically explained that adopting the Measuring Broadband America (MBA) testing was under consideration. Indeed, many of the performance testing requirements were derived from or influenced by the Commission’s experience with MBA testing. As such, parties had ample notice that the testing regime adopted by the Bureaus, which is a less burdensome variation of the MBA testing, was a potential option. Any argument to the contrary is unfounded.

25. Complaints that the frequency of latency testing will affect network performance also are speculative. The latency testing frequency framework ultimately adopted by the Bureaus is substantially

less extensive than the MBA program testing. For example, MBA testing sends approximately 2,000 User Datagram Protocol (UDP) packets per hour, and these 2,000 individual results are summarized as a single reporting record that reflects all 2,000 tests. To be clear, MBA requires latency to be tested *2,000 times per hour*, with results summarized into one record. Conversely, the Bureaus adopted testing of 60 UDP packets per hour that consists of approximately 3% of the typical MBA load. The more intensive MBA test frequency has not been found to pose any technical or other difficulties, so there is no reason to believe that the vastly lower frequency of latency testing adopted by the Bureaus will cause concerns. Requiring 60 UDP packets per hour rather than 2,000 balances the need for sufficient testing while minimizing the burden of testing on carriers.

26. The Commission also agrees with the Bureaus that the disparity in testing frequency between speed and latency reflects the different type of testing necessary to determine whether carriers are meeting the required benchmarks. The purpose of speed testing is to determine if the network is properly provisioned to furnish the required speed and whether the network provides sufficient throughput to handle uploads and downloads at particular speeds and times. Because of the burden that such testing puts on a carrier's network, the Bureaus adopted the minimum number of tests necessary to ensure that consumers are receiving broadband service at required speed levels. On the other hand, latency testing indicates whether there is sufficient capacity in the network to handle the level of traffic, which is of particular importance when the network is experiencing high traffic load. In this respect, latency is similar to a pulse rate and can vary substantially as a result of several factors. Even if all these factors are unknown, frequently monitoring latency determines the ability of the network to handle various circumstances and factors that are affecting it. As NTCA, NRECA, and UTC explain:

[T]here is logic in a protocol that tests for latency more frequently than speed. The impact of latency is measured in and discernible by milliseconds: the frequency of testing aims to illuminate whether variables that perforate performance are present. In contrast, speed contemplates a steadier aspect of the network facility, and therefore does not require as frequent testing to demonstrate compliance. Therefore, in as much as latency-sensitive services and applications

(including but not limited to voice) are affected by millisecond variables, NTCA, NRECA and UTC urge the Commission to maintain its rigorous standards for latency testing.

And, in any event, conducting more tests for latency is to the carrier's benefit, because of the variability of latency and resulting greater likelihood that outlier failures will not affect the overall rate.

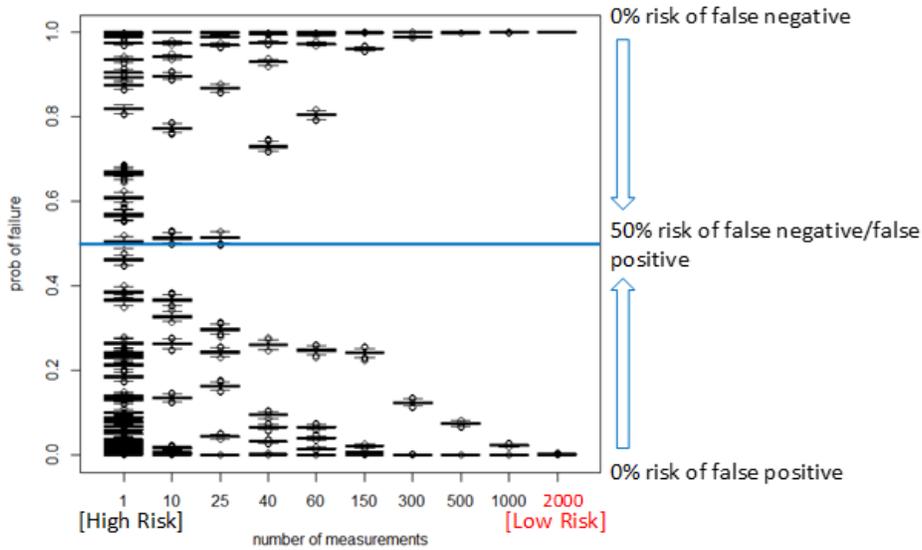
27. The Commission appreciates AT&T's willingness to share its internal data and analysis. However, AT&T's data reflect only the capabilities of its own network and consisted of a very small sample set—18 customers for one peak period in one instance and “almost” 100 subscribers for one peak period in the other. The Commission also notes that even AT&T's data demonstrated a substantial variation between testing once per hour and once per minute. For example, in its testing, AT&T found that per minute latency testing of customers served by varying technologies showed that 1.17% of tests were higher than 100 ms but once per hour testing showed that 3.04% of tests showed a latency of higher than 100 ms. A difference of 2% when the latency standard is 5% is substantial.

28. Analysis undertaken by Commission staff confirms the importance of more frequent testing to account for the variability associated with latency. Commission staff compared the conclusions that AT&T—and supported by ITTA—drew from its data to what the much larger MBA data demonstrate. This analysis indicates that the risk of false positives and false negatives (i.e., sample test results indicate that a carrier fails, when given overall network performance, it should have passed, or that a carrier passes, when given overall network performance, it should have failed) varies significantly based on the number of measurements per hour. Because the Commission's performance standard for latency requires 95% of the latency measurements to be less than or equal to 100 ms, a carrier would fail the standard if more than 5% of its latency measurements are greater than 100 ms. In general, staff's analysis found that a greater number of measurements reduces the impact of data outliers and makes false positives and false negatives less likely. For example, a single 200 ms data outlier among a sample of 10 latency measurements that otherwise are all under 100 ms would result in the carrier's failing to meet the 95% threshold (i.e., only 9 out of 10 or 90% of the measurements would be at or under 100 ms). However, a single data outlier of 200 ms in a sample of 100 latency measurements would not, in the

absence of at least five other measurements exceeding 100 ms, cause the carrier to fail (i.e., 99 out of 100 or 99% of the measurements would be at or under 100 ms).

29. Additionally, staff analysis of MBA data indicated that the distribution of latency among carriers varies widely even within the same minute. This means that latency varies significantly depending upon the traffic on the network at any given time and does not vary in the same way for each carrier or even within each day for each carrier. Because of the countless number of distributions observed among carriers reflected by the MBA data, the Commission concludes that a smaller number of observations would not yield reliable testing results. Thus, more testing provides the Commission with greater ability to detect bad performance in cases where a carrier's latency is consistently high. In other words, since the likelihood of failing or passing the Commission's latency standard depends, to some degree, on random noise, the more measurements taken by a carrier, the less likely that random factors would cause it to fail the standard.

30. The figure in the following demonstrates staff's analysis of the estimated probability of failure and associated risk of false positive or false negative results with different numbers of measurements from a range of latency distributions observed in the MBA data. Each box (bar) represents the estimated probability of failure for a given latency distribution. The difference in the probability of failure between N number of measurements and N=2000 is the estimated risk of a false positive (the test result indicates that a carrier fails when it should have passed) and a false negative (the test result indicates that a carrier passes when it should have failed). As demonstrated, there is a much higher risk of a false positive or false negative under AT&T's proposed once per hour latency measurement as compared to a moderate risk from 60 measurements per hour.



Thus, staff’s analysis shows that, given the high variability of latency, one of two things would occur if the Commission required only one measurement per hour: either a few extreme measurements would cause a carrier to fail the standard when, in fact, it should pass given its overall performance, or the Commission would be unable to capture consistent poor performance by a carrier that should fail based on the overall performance of its network. As a result, a moderate-risk approach of 60 measurements per hour strikes a balance between the burden of testing on carriers and the risk of failure by carriers caused by uncertainty.

31. Finally, the Commission notes that some parties may misunderstand what exactly constitutes a latency test for purposes of the performance measures. Specifically, USTelecom states that, “[t]esting every minute may also overload some testing methods and cause testing to be disrupted,” implying that a carrier must start and stop a latency test every minute within a test-hour. While the Commission does not believe this interpretation is consistent with the intent of the *Performance Measures Order*, it provides greater clarity here on what is considered a sufficient latency test to assuage concerns about the number of latency tests per hour. As the Bureaus described in the *Performance Measures Order*, a “test” constitutes a “single, discrete observation or measurement of speed or latency.” While carriers may choose to continuously start and stop latency testing every minute and record the specific

result, the Commission clarifies that there is no requirement to conduct latency testing in this manner. Instead, carriers may continuously run the latency testing software over the course of a test-hour and record an observation or measurement every minute of that test-hour. If a carrier transmits one packet at a time for a one-minute measurement, the carrier should report the result of that packet as one observation. However, some applications, such as ping, commonly send three packets and only report summarized results for the minimum, mean, and maximum packet round trip time and not individual packet round trip time. If this is the case, the carrier should report the mean as the result of this observation. If the carrier sends more than one packet and the testing application allows for individual round trip time results to be reported for each packet, then the carrier must report all individual measurements for each packet. Such an approach plainly fits within the definition of “test” adopted by the Bureaus in the *Performance Measures Order* and does not require constant starting and stopping of the latency testing software. In sum, carriers have the flexibility to choose how to conduct their latency testing, so long as one separate, discrete observation or measurement is recorded each minute of the specific test-hour.

32. The Bureaus required that carriers test a maximum of 50 subscriber locations per required service tier offering per state, depending on the number of subscribers a carrier has in a state, randomly selected every two years. The *Performance Measures Order* included scaled requirements permitting smaller carriers (i.e., carriers with fewer than 500 subscribers in a state and particular service tier) to test 10% of the total subscribers in the state and service tier, except for the smallest carriers (i.e., carriers with 50 or fewer subscribers), which must test five subscriber locations. The Bureaus also recognized that, in certain situations, a carrier serving 50 or fewer subscribers in a state and service tier may not be able to test even five active subscribers; the Bureaus permitted such carriers to test a random sample of existing, non-CAF-supported active subscriber locations within the same state and service tier to satisfy the testing requirement. In situations where a subscriber at a test location stops subscribing to the service provider within 12 months after the location was selected, the Bureaus required that the carrier test another randomly selected active subscriber location. Finally, the Bureaus explained that carriers may use

inducements to encourage subscribers to participate in testing, which may be particularly useful in cases where support is tied to a particular performance level for the network, but the provider does not have enough subscribers to higher performance service tiers to test to comply with the testing sample sizes.

33. Petitioners and applicants raise various concerns regarding the required number of subscriber test locations. Micronesian Telecommunications Corporation (MTC), for example, argues that it and similar carriers that may have fewer than 50 subscribers in a particular state and speed service tier will be unable to comply with the test locations requirement. MTC claims that it will be difficult to find even five customers to test, particularly in higher service tiers. Asking that the Commission “provide a safety valve” for similar small carriers, MTC proposes that such a provider should “test no more than 10 percent of its customers in any given service tier, with a minimum of one test customer per service tier with customers.” NTCA argues that testing 10% of subscribers may be excessive; instead, NTCA proposes that carriers should test the lesser of 50 locations per state or 5% of active subscribers. Further, NTCA argues that carriers should not be required to upgrade the speed or customer premises equipment for individual locations even temporarily to conduct speed tests. WTA suggests that, at least for rural carriers, the number of test locations should be much lower than adopted in the *Performance Measures Order*. Smaller carriers must test larger percentages of their customers compared to larger carriers; accordingly, WTA argues, the Commission should permit testing of just 10-15 locations or 2-3% of subscribers in each CAF-required service tier.

34. NTCA, as well as USTelecom, ITTA, and WISPA, also ask that the Commission clarify that carriers may use the same locations for testing both speed and latency. USTelecom, ITTA, and WISPA explain that, if carriers must conduct speed and latency testing at different locations, the number of subscribers that must be tested would be unnecessarily doubled, which “would be particularly troublesome for smaller recipients, many of whom will be drawing test locations from a small group of subscribers.” Similarly, the petitioners explain, the requirement regarding the number of test locations should be clarified to be exactly the same for both speed and latency. These clarification proposals drew broad support from commenters. For example, comments submitted jointly by NTCA, NRECA, and

UTC assert that the clarifications would help providers “avoid unnecessary costs and excessive administrative burden,” while Midcontinent Communications notes that using “the same panelists for speed and latency testing for CAF purposes would align with [its] internal testing practices.”

35. A few parties offer suggestions regarding the parameters for the random selection process. In particular, WTA asks that locations should be tested for five years, instead of two years, before a new random sample of test locations is chosen. WTA also proposes that twice the required random number of testing locations be provided to carriers so that carriers can replace locations where residents refuse to participate or have incompatible CPE. Frontier, in an *ex parte* filing, proposes that carriers be allowed to test only new customer locations; it argues that installing the necessary testing equipment at older locations requires more time than is available with the adopted testing schedule.

36. The Commission declines to modify the adopted sample sizes for testing speed and latency. To minimize the burdens of testing, the Bureaus have used a “trip-wire” approach in determining the required sample sizes. In other words, the adopted sample sizes produce estimates with a high margin of error but can show where further inquiry may be helpful; the Commission’s target estimation precision is a 90% confidence level with an 11.5% margin of error. For the largest carriers, i.e., those with over 500 subscribers in a given state and speed service tier, this requires a sample size of 50 subscriber locations. For the smallest carriers, the Bureaus adopted small sample sizes that result in less precision, with the margin of error reaching 34.9%, to reduce the testing burden on smaller providers. Reducing the sample sizes for smaller carriers even more would further reduce the resulting estimation precision—making the test data even less likely to be representative of the actual speed and latency consumers experience on CAF-supported networks. The Commission therefore does not modify the required numbers of subscriber locations carriers must test.

37. Nonetheless, the Commission recognizes that a few carriers facing unique circumstances may find it extraordinarily difficult to find a sufficient number of subscriber locations to test. Although the Commission declines to modify the adopted sample sizes, the Commission appreciates that special circumstances occasionally demand exceptions to a general rule. The Commission’s rules may be waived

for good cause shown.

38. For carriers that cannot find even five CAF-supported locations to test, the Commission also reconsiders the Bureaus' decision to permit testing of non-CAF-supported active subscriber locations within the same state and service tier. Testing and reporting speed and latency for non-CAF-supported locations adds unnecessary complexity to the Commission's requirements. Accordingly, the Commission requires that any non-compliant carrier testing fewer than five CAF-supported subscriber locations because more are not available would be subject to verification that more customers are not available, rather than requiring that all carriers testing fewer than five CAF-supported subscriber locations find non-CAF-supported locations to test.

39. Additionally, the Commission recognizes that, as several parties have noted, obtaining customer consent for testing which requires placement of testing equipment on customer premises may prove difficult. The Commission believes that its revised testing implementation schedule (discussed in the following) will help alleviate this concern, particularly for smaller carriers. Numerous vendors are developing software solutions that will allow providers to test the service at customer locations without requiring any additional hardware at the customer's premises. Further, the Commission directs WCB to publish information on the Commission's website explaining the nature and purpose of the required testing—to ensure that carriers are living up to the obligations associated with CAF support—and urging the public's participation. The Commission expects that providing such information in an easy-to-understand format will help alleviate subscribers' potential concerns. Moreover, the Commission emphasizes that no customer proprietary network information is involved in the required testing or reporting, other than information for which the carrier likely would already have obtained customer consent; carriers routinely perform network testing of speed and latency and the performance measures testing the Commission is requiring is of a similar nature.

40. The Commission agrees with comments recommending that the same sample sizes adopted for speed should also apply to latency, and that the same subscriber locations should be used for both speed and latency tests. As some parties have noted, requiring testing of two separate sets of

subscriber locations for speed and latency, rather than the same group of locations for both, is unnecessarily burdensome. By requiring speed and latency tests at the same subscriber locations, the Commission reduces the amount of equipment, coordination, and effort that may otherwise be involved in setting up testing. Therefore, carriers will test all of the locations in the random sample for both speed and latency. The Commission notes that because it is adopting different implementation dates for testing of different broadband deployment programs, a carrier will receive a separate random sample of testing locations for each program for which it must do performance testing. In the *Performance Measures Order*, the Bureaus stated that, “[a] carrier with 2,000 customers subscribed to 10/1 Mbps in one state through CAF Phase II funding and 500 rural broadband experiment (RBE) customers subscribed to 10/1 Mbps in the same state, and no other high-cost support with deployment obligations, must test a total of 50 locations in that state for the 10/1 Mbps service tier.” But because CAF Phase II and RBE have different implementation dates for testing, the carrier in this example must test 50 locations for its CAF Phase II obligations and 50 locations for its RBE obligations. Similarly, because the Commission now requires carriers to use the same sample for both speed and latency, it reconsiders the requirement that carriers replace latency testing locations that are no longer actively subscribed after 12 months with another actively subscribed location. The Bureaus did not make clear if this provision applied to both speed and latency test locations. To avoid confusion, the Commission clarifies that the same replacement requirements should apply to both speed and latency. Therefore, the Commission now requires that carriers replace non-actively subscribed locations with another actively subscribed location by the next calendar quarter testing. Although the Commission does not believe it is necessary for carriers to obtain a random list of twice the number of required testing locations at the outset, carriers should be able to obtain additional randomly selected subscriber locations as necessary for these kinds of situations.

41. The Commission reconsiders the Bureaus’ requirement that carriers meet and test to their CAF obligation speed(s) regardless of whether their subscribers purchase Internet service offerings with speeds matching the CAF-required speeds for those CAF-eligible locations. Specifically, in situations where subscribers purchase Internet service offerings with speeds lower than the CAF-required speeds for

those locations, carriers are not required to upgrade individual subscriber locations to conduct speed testing unless there are no other available subscriber locations at the CAF-required speeds within the same state or relevant service area. The Commission recognizes that there may be significant burdens associated with upgrading an individual location, particularly when physically replacing equipment at the customer premises is necessary. Some carriers may still find it necessary to upgrade individual subscriber locations, at least temporarily, to conduct speed testing. The Commission does not believe that requiring temporary upgrades of service of testing locations in these instances will discourage bidding in future auctions. Carriers participating in auctions should be prepared to provide the required speeds at all of the locations in the relevant service area and should anticipate that over time more and more customers in the service area will be purchasing the higher-speed offerings.

42. Finally, the Commission rejects proposals to require testing only of newly deployed subscriber locations and to maintain the same sample for more than two years. If the Commission were to permit testing of only new locations, carriers' speed and latency test data would not reflect their previous CAF-supported deployments, for which carriers also have ongoing speed and latency obligations. Moreover, although the Bureaus adopted the *Performance Measures Order* in 2018, carriers have been certifying that their CAF-supported deployments meet the relevant speed and latency obligations for several years. Requiring testing of older locations should not prove a problem for carriers that have been certifying that their deployments properly satisfy their CAF obligations. In any case, further shrinking the required sample to include only more recent deployments would compromise the effectiveness of the "trip-wire" sample; the Commission would not be able to identify potential problems with many older CAF-supported deployments. Maintaining the same sample beyond two years would present the opposite problem. By excluding newer deployments, the Commission's understanding of carriers' networks would be outdated; the Bureaus' decision to require testing a different set of subscriber locations every two years struck the correct balance between overburdening carriers and maintaining a current, relevant sample for testing.

43. The Bureaus required quarterly testing for speed and latency. In particular, to capture

any seasonal effects and differing conditions throughout the year that can affect a carrier's broadband performance, the Bureaus required carriers subject to the performance measures to conduct one week of speed and latency testing in each quarter of the calendar year.

44. WTA argues that spreading testing across the year imposes a substantial burden, particularly on rural carriers, without producing more accurate information than a single week of testing. WTA also contends that obtaining consent from customers to allow testing for four weeks a year "is going to be extremely difficult and likely to become a customer relations nightmare." Instead, WTA argues that testing for a single week in late spring or early fall would be more representative of typical Internet usage. WTA cites these claimed difficulties as a reason for reducing the number of weeks of annual testing, reducing the numbers of locations to be tested, allowing more flexible selection of customer locations, and using the test locations for longer periods.

45. The Commission declines to adjust the quarterly testing requirement as proposed by WTA. As the Bureaus acknowledged when they adopted the quarterly requirement, different conditions exist throughout the year that can affect service quality, including changes in foliage, weather, and customer usage patterns, school schedules, holiday shopping, increased or decreased customer use because of travel and sporting events, and business cycles. The goal of the testing requirements is to ensure that consumers across the country experience consistent, quality broadband service throughout the year, not at only one defined point during the year. Additionally, the Commission believes WTA's concerns regarding customer consent are unfounded. The Commission expects that once the requisite technology and software to conduct the required testing has been installed, testing the performance of the network for one week per quarter will not impose any additional significant burden on carriers or customers. Moreover, the tests themselves use so little bandwidth that the Commission does not believe customers will even notice that testing is occurring. Indeed, as the Bureaus explained, quarterly testing "strikes a better balance of accounting for seasonal changes in broadband usage and minimizing the burden on consumers who may participate in testing."

46. The Commission confirms that carriers may use any of the three methodologies outlined

in the *Performance Measures Order* to demonstrate their compliance with network performance requirements. The Commission has previously determined that it should provide carriers subject to performance testing with flexibility in determining the best means of conducting tests. In 2013, WCB had determined that price cap carriers generally may use “existing network management systems, ping tests, or other commonly available network measurement tools,” as well as results from the MBA program, to demonstrate compliance with latency obligations associated with CAF Phase II model-based support. Thus, the Bureaus concluded that ETCs subject to fixed broadband performance obligations would be permitted to conduct testing by employing either: (1) MBA testing infrastructure (MBA testing), (2) existing network management systems and tools (off-the-shelf testing), or (3) provider-developed self-testing configurations (provider-developed self-testing or self-testing). The Bureaus reasoned that the flexibility afforded by three different options offered “a cost-effective method for conducting testing for providers of different sizes and technological sophistication.”

47. NTCA requests clarification about language in the *Performance Measures Order* stating that “MBA testing must occur in areas and for the locations supported by CAF, *e.g.*, in CAF Phase II eligible areas for price cap carriers and for specific built-out locations for RBE, Alternative Connect America Cost Model (A-CAM), and legacy rate-of-return support recipients.” NTCA contends that this language refers to previously-promulgated MBA testing requirements and that the Commission should clarify that ETCs subject to fixed broadband performance obligations should be permitted to use any of three testing options outlined by the Bureaus.

48. The language highlighted by NTCA applies only to carriers choosing the MBA testing option; the Bureaus set out additional, separate requirements for carriers choosing to use off-the-shelf or provider-developed testing options. As the *Performance Measures Order* explained, in the event that a carrier opts to use the MBA testing methodology to collect performance data, it must ensure boxes are placed at the appropriate randomly selected locations in the CAF-funded areas, as required for the CAF testing program. If, on the other hand, a carrier opts for either off-the-shelf testing tools or its own self-testing, it must use the testing procedures specific to the providers’ respective chosen methodology.

49. To achieve full compliance with the latency and speed standards, the *Performance Measures Order* required that 95% of latency measurements during testing windows fall below 100 ms round-trip time, and that 80% of speed measurements be at 80% of the required network speed. Based on the standard adopted by the Commission in 2011, WCB used ITU calculations and reported core latencies in the contiguous United States in 2013 to determine that a latency of 100 ms or below was appropriate for real-time applications like VoIP. WCB thus required price cap carriers receiving CAF Phase II model-based support to test and certify that 95% of testing hours latency measurements are at or below 100 ms (the latency standard). Later, WCB sought comment on extending the same testing methodologies to other high-cost support recipients serving fixed locations, and in multiple orders, the Commission extended the same latency standard to RBE participants, rate-of-return carriers electing the voluntary path to model support, CAF Phase II competitive bidders not submitting high-latency bids, and Alaska Plan carriers.

50. The Bureaus ultimately reaffirmed and further extended the latency standard to all high-cost support recipients serving fixed locations, except those carriers submitting high-latency bids in the CAF Phase II auction. In doing so, the Bureaus noted that the data on round-trip latency in the United States had not markedly changed since the *CAF Phase II Price Cap Service Obligation Order*, and that no parties challenged the Commission's reasoning for the existing 100 ms standard. More recently, the Bureaus refreshed the record, seeking comment on USTelecom's proposal that certifying "full" compliance means that 95 to 100% of all of an ETCs measurements during the test period meet the required speed. The Bureaus then adopted a standard requiring that 80% of a carrier's download and upload measurements be at or above 80% of the CAF-required speed (i.e., an 80/80 standard). The Bureaus explained that this speed standard best meets the Commission's statutory requirement to ensure that high-cost-supported broadband deployments provide reasonably comparable service as those available in urban areas. The Bureaus also noted that they would exclude from certification calculations certain speed measurements above a certain threshold to ensure that outlying observations do not unreasonably affect results.

51. In their Petition, USTelecom, ITTA, and WISPA complain that “[t]here is . . . a significant disparity in compliance thresholds for speed and latency,” and ask that the Bureaus require ETCs’ latency measurements to meet 175 ms at least 95% of the time. The petitioners argue that, before accepting CAF Phase II model-based support, carriers could not have fully understood whether the latency standard adopted in 2013 was appropriate, apparently because it was adopted “almost two full years before price cap carriers accepted CAF Phase II support,” and other “reasonable” requirements were adopted later. Further, the petitioners argue, the same ITU analysis that WCB relied on in 2013 to adopt the latency standard “found that consumers continue to be ‘satisfied’ with speech quality at a one-way mouth-to-ear latency of 275 ms or a provider round-trip latency of 175 ms,” so “treating a latency result that is even one millisecond above 100 ms as a violation . . . penaliz[es] recipients for providing users with voice quality with which they are fully satisfied.” Changing the standard to require latency measurements of 175 ms or better 95% of the time, petitioners assert, would better align the latency standard with the speed standard, which is designed to ensure that high-cost-supported broadband deployments are reasonably comparable to those in urban areas.

52. NTCA, NRECA, and UTC oppose the petitioners’ request to “align” the latency standard with the speed standard. Defending the 95% threshold adopted by the Bureaus, these parties explain that low latency is necessary to support achieving a “reasonably comparable” level of service, and the 95% compliance benchmark for latency is a “reasonable” standard for that. Moreover, speeds may vary up to 20% because of “networking protocols, interference and other variances that affect all providers and whose accommodation is technology neutral,” but such factors do not affect latency. Thus, they say, the record supports the adopted latency standard.

53. Multiple parties seek clarifications regarding implementation of the 80/80 speed standard adopted in the *Performance Measures Order*. In particular, carriers expressed concern that compliance will be measured against advertised speeds, rather than the speeds carriers are obligated to provide in exchange for CAF support. In addition, USTelecom, ITTA, and WISPA, among others, challenge the Bureaus’ finding that speed test results greater than 150% of advertised speeds are likely invalid and ask

that the Bureaus reconsider automatically excluding those measurements from compliance calculations. Instead, Vantage Point suggests, the Commission should consider excluding data points beyond a defined number of standard deviations, rather than setting a 150% cutoff for measurements.

54. The Commission declines to modify the longstanding latency standard requiring that 95% of round-trip measurements be at or below 100 ms. As petitioners acknowledge, the standard was initially adopted in 2013, before carriers accepted CAF Phase II model-based support. Petitioners claim that, as a result, “no future recipient could have been expected to assess the appropriateness of this prematurely adopted requirement,” but, in fact, carriers accepted CAF Phase II support conditioned on the requirement that they certify to the adopted latency standard. In other words, carriers assessed the appropriateness of the standard and decided that they would be able to certify meeting the standard—or, at the very least, accepted that they would risk losing CAF Phase II support if they were unable to meet the standard. Moreover, no parties sought reconsideration when the standard was originally adopted, and the Commission later extended the same standard to other high-cost support recipients in the years following.

55. The Commission also notes that latency is fundamentally different from speed and therefore requires a different standard to ensure that CAF-supported broadband Internet service is reasonably comparable to service in urban areas. The 100 ms standard, which is more lenient than the 60 ms standard originally proposed, ensures that subscribers of CAF-supported Internet service can use real-time applications like VoIP. If the Commission were to require 95% of latency measurements to be only 175 ms or lower, it would be relaxing the standard considerably—permitting CAF-supported Internet service to have 75% higher latency than permitted by the existing standard adopted by the Commission. Further, lowering the existing standard would not decrease burdens on carriers and provide “a more efficient compliance and enforcement process,” as the petitioners suggest. The carriers need only to conduct tests, which can be automated, and provide the data; Universal Service Administrative Company (USAC) will complete the necessary calculations to determine compliance. To the extent that parties argue that the 100 ms standard is overly strict and that consumers may be satisfied with higher latencies,

that standard was adopted in prior Commission orders and thus is not properly addressed in this proceeding, which is to determine the appropriate methodology for measuring whether high-cost support recipients' networks meet established performance levels.

56. The Commission clarifies, however, that carriers are not required to provide speeds beyond what they are already obligated to deploy as a condition of their receipt of high-cost support. Thus, for a location where a carrier is obligated to provide 10/1 Mbps service, the Commission only requires testing to ensure that the location provides 10/1 Mbps service, even if the customer there has ordered and is receiving 25/3 Mbps service.

57. Regarding the trimming of data in calculating compliance with the speed standard, the Commission reconsiders the Bureaus' decision to exclude from compliance calculations any speed test results with values over 150% of the advertised speed for the location. Instead of trimming the data at the outset as the Bureaus had required, the Commission directs the Bureaus to study data collected from carriers' pre-testing and testing and determine how best to implement a more sophisticated procedure using multiple statistical analyses to exclude outlying data points from the test results. The Commission anticipates that the Bureaus will develop such a procedure for USAC to implement for each carrier's test results in each speed tier in each state or study area and may involve determining whether multiple methods (e.g., the interquartile range, median absolute deviation, Cook's distance, Isolation Forest, or extreme value analysis) flag a particular data point as an anomaly.

58. The *Performance Measures Order* also established a framework of support reductions that carriers would face in the event that their performance testing did not demonstrate compliance with speed and latency standards to which each carrier is subject. The Bureaus considered numerous approaches to address non-compliance with the required speed and latency standards. They adopted a "four-level framework that sets forth particular obligations and automatic triggers based on an ETCs degree of compliance with the Commission's latency, speed, and, if applicable, MOS testing standards in each state and high-cost support program." Under this scheme, compliance for each standard is separately determined, with the percentage of a carrier's measurements meeting the relevant standard

divided by the required percentage of measurements to be in full compliance. The Bureaus noted that the framework “appropriately encourages carriers to come into full compliance and offer, in areas requiring high-cost support, broadband service meeting standards consistent with what consumers typically experience.”

59. Broadly, the Commission’s goal in establishing a performance testing regime is to ensure that consumers receive broadband at the speed and latency to which carriers have committed, and for which they are receiving support. The Commission’s compliance regime is designed to encourage them to provide high quality broadband, not to punish carriers for failing to perform. That is why the Bureaus adopted an interim schedule for withholding support for failing to meet the required performance, but to return such support as the carrier comes into compliance. This is consistent with the Commission’s approach to construction of network facilities, i.e. support is withheld if carriers do not meet their build-out milestones, but as the carrier improves its performance, withheld support is returned. There is no correlation in either case between the interim percentages of support withheld and the total per-location support; rather, these interim withholdings are designed solely to encourage the carrier to meet its obligations and ensure that progress is continuing. The Commission notes that carriers have their entire support term to improve their networks and come into compliance. Even at the end of the support term, the Commission’s rules provide for a one-year period before any support is permanently withheld, during which the carrier can show that it has fixed the problems with its network. Further, as explained in the following, the Commission add san opportunity for carriers to request a larger, statistically valid sample if the carrier believes that the small sample size is the cause of the failure to perform. The Commission therefore anticipates few instances of non-compliance with the Commission’s performance measures.

60. Several parties urge the Commission to adjust the adopted framework for non-compliance. USTelecom, ITTA, and WISPA jointly argue that non-compliance with the speed and latency requirements is subject to support withholding under the established framework that is “more severe[] than non-compliance with build-out milestones.” For example, they observe that a carrier with a compliance gap of less than six percent would lose 5% of its high-cost support, while only being subject

to quarterly reporting obligations for missing its required build out by up to 14.9%. USTelecom, ITTA, and WISPA instead propose mirroring the precedent established for the deployment milestone framework, with non-compliance with the speed and latency requirements of 5% or less resulting only in a quarterly reporting obligation and non-compliance of 5% to 15% resulting in 5% of funding being withheld. Additionally, they request clarification that a carrier not complying with both its performance measurement requirements and deployment requirements will be subject only to a reduction in support equal to the greater of the two amounts, rather than the combined percentage of the two amounts. AT&T concurs with petitioners that support reductions for failing to comply with performance standards should not be more serious than failure to deploy. NTCA, NRECA, and UTC jointly contend that “non-compliance (especially if relatively minor in degree) should impose upon the provider the burden of proof to demonstrate a justifiable reason for non-compliance and an avenue toward remediation; it should not eliminate automatically support upon which the provider relies for deployment and operation.” WTA proposes that rural carriers not in full compliance be given a six-month grace period “to locate and correct the problem without reduction or withholding of the monthly high-cost support needed to finance the repair, upgrade and operation of [their] networks.” WTA also reiterates that rural local exchange carriers (LECs) should not lose high-cost support due to the shortcomings of facilities or circumstances over which they have no control and are not able to repair or upgrade. Finally, Peñasco Valley Telephone Cooperative argues that a 100% success requirement for full compliance does not take into account factors outside the carrier’s control and instead proposes a high percentage benchmark, but less than 100%, to account for these variables.

61. Except as discussed in the following, the Commission generally declines to revise the compliance and certification frameworks adopted by the Bureaus. The Commission disagrees that the consequences for failure to meet its performance measures are greater than that for failure to meet deployment obligations. As opposed to the deployment obligations that many parties use for comparison, the speed and latency standards adopted by the Bureaus include a margin for error and do not require carriers to meet the established standards in every instance. For example, carriers are required to meet the

100 ms standard for latency only 95% of the time, rather than 100% as suggested by some parties. Similarly, the Commission allows carriers to be in compliance with its speed standards if they provide 80% of the required speed 80% of the time. Moreover, the Commission establishes pre-testing periods in which no support reductions for failing to meet standards will occur to allow carriers to adjust to the new regime. This opportunity for pre-testing will ensure that carriers are familiar with the required testing and how to properly measure the speed and latency of their networks. Because carriers will be aware of which locations are being tested, they will be able to monitor their networks prior to beginning the required testing to make sure the network is performing properly. Further, once a location is certified in USAC's High Cost Universal Broadband (HUBB) portal, the carrier has certified that it meets the required standards, so the performance of the network should not be a surprise to the carrier.

62. Some parties have expressed concern about the performance requirements and the non-compliance support reductions. For example, USTelecom, ITTA, and WISPA argue that certain aspects of the compliance framework “penalize non-compliance with broadband speed and latency requirements more severely than non-compliance with build-out milestones.” They also assert that the compliance framework is “is too stringent and could impede—rather than advance—broadband deployment in rural CAF-supported areas.” The Commission disagrees. As a condition of receiving high-cost support, carriers must commit not only to building out broadband-capable networks to a certain number of locations, but also to providing those locations with a specific, defined level of service. Building infrastructure is insufficient to meet a carrier’s obligation if the customers do not receive the required level of service. If a carrier fails to meet its deployment requirements, it will face certain support reductions, and if it likewise fails to meet its performance requirements for locations to which it claims it has deployed, it has failed to fully fulfill its obligations. The compliance framework established by the Bureaus is essential to ensuring that consumers are receiving the appropriate level of service that the carrier has committed to provide.

63. The Commission emphasizes that at the conclusion of a carrier’s build-out term, any failure to meet the speed and latency requirements is a failure to deploy because the carrier is not

delivering the service it has committed to deliver. A failure to comply with all performance measure requirements will result in the Commission determining that the carrier has not fully satisfied its broadband deployment obligations at the end of its build-out term and subjecting the carrier to the appropriate broadband deployment non-compliance support reductions. The Commission does not consider a carrier to have completed deployment of a universal service funded broadband-capable network simply by entering the required number of locations to which it has built into the HUBB; customers at those locations also must be able to receive service at the specific speed and latency to which the carrier has committed. Simply put, consumers must receive the required level of service before a network can be considered to have been fully deployed. Otherwise, a carrier would not be meeting the conditions on which it receives support to deploy broadband.

64. Several parties argue that there is insufficient notice for clarifying that “any failure to meet the speed and latency requirements will be considered a failure to deploy.” The Commission disagrees. When establishing the CAF in 2011, the Commission noted that it “will require recipients of funding to test their broadband networks for compliance with speed and latency metrics,” and each recipient of high-cost support with defined build-out obligations must deploy broadband service with available speeds as required by the Commission. Indeed, the Commission found that verifiable test results would allow the Commission “to ensure that ETCs that receive universal service funding are providing at least the minimum broadband speeds, and thereby using support for its intended purpose as required by section 254(e)”; if the support is not used to provide the required level of service, it is not being used for its intended purpose under section 254(e). Carriers do not receive high-cost support to just install any network; they must deploy a broadband-capable network actually meeting the required speed and latency metrics. Indeed, section 54.320(d)(1) of the Commission’s rules provides that “[f]or purposes of determining whether a default has occurred, a carrier must be offering service meeting the requisite performance obligations.”

65. The Commission uses the testing data to determine the level of compliance for the carrier’s network, as defined by the Bureaus in the *Performance Measures Order*. Thus, at the end of a

carrier's build-out term, if a carrier has deployed to 100% of its required locations, but its overall performance compliance percentage is 90%, USAC will recover the percentage of the carrier's support equal to 1.89 times the average amount of support per location received in the state for that carrier over the term of support for the relevant performance non-compliance percentage (i.e., 10%), plus 10 percent of the carrier's total relevant high-cost support over the support term for that state. Similarly, if a carrier deploys to only 90% of the locations to which it is required to build, and of those locations, the performance compliance percentage is 90%, the carrier will be required to forfeit support equal to 1.89 times the average amount of support per location received in the state for that carrier over the term of support for both the 10% of locations lacking deployment and an additional 9% of locations (reflecting a non-compliance percentage of 10% for the 90% deployed locations), plus 10 percent of the carrier's total relevant high-cost support over the support term for that state. However, carriers are permitted up to one year to address any shortcomings in their deployment obligations, including ensuring that their performance measurements are 100% in compliance, before these support reductions will take effect.

66. To provide certainty to carriers and to take into account that carriers may be in compliance with performance obligations during their testing periods, but for whatever reason may not be in compliance at the end of the support term, the Commission more narrowly tailors its end-of-term non-compliance provisions to recognize past compliance. Accordingly, the Commission will withhold support where a carrier is unable to demonstrate compliance at the end of the support term only for the amount of time since the carrier's network performance was last fully compliant. Specifically, the Commission modifies the support recovery required by section 54.320(d) that is related to compliance with performance measures by multiplying it by the percentage of time since a carrier was last able to show full compliance with required performance testing requirements prior to the end of the support term on a quarterly basis. For example, if a carrier's failure to meet end-of-term performance measures under section 54.320(d) resulted in it having to repay support associated with 10% of locations to which it was obligated to deploy (and not including any support related to a failure to build and install the network as determined by USAC verifications) and the carrier's performance testing had not been in compliance with

the Commission's requirements for the 15 preceding quarters of testing, out of a total of 20 annual quarters in which it received support, the amount of support to be recovered would be multiplied by 15/20 or 3/4. If a carrier was not in compliance with the Commission's performance measures for 5 quarters of testing but comes into compliance before or during end-of-term testing, USAC will not recover any support. However, because carriers have an affirmative duty to demonstrate compliance with network performance measures—as they have with respect to physical build-out milestones—a carrier that has never been in compliance with performance testing requirements at any time during the testing period will have the appropriate amount of support withheld at the end of the support term for the entire term. The Commission believes that this approach more narrowly ties the non-compliance consequences to the period of time in which a carrier fails to comply with performance requirements.

67. In response to commenters' concerns regarding the fairness of potentially reducing carriers' support amounts for both lack of deployment and non-compliance with speed and latency standards, the Commission clarifies that at the end of the support term when USAC has performed the calculation to determine the total lack of deployment based on the numbers of locations to which the carrier has built out facilities and the number of locations that are in compliance with the performance measures, USAC will ensure that the total amount of support withheld from the carrier because of failure to meet deployment milestones and performance requirements does not exceed the requirements of § 54.320(d)(2). To facilitate this calculation, the Commission reconsiders the decision allowing carriers to recover only the support withheld for non-compliance for 12 months or less. When a non-compliant carrier comes into a higher level of compliance, USAC will now return the withheld support up to an amount reflecting the difference between the levels' required withholding. By returning all the support USAC may have withheld from a carrier for non-compliance, the non-compliance framework will continue to provide an incentive to carriers to return to full compliance with the speed and latency standards.

68. Finally, the Commission provides additional flexibility at the conclusion of a carrier's build-out term for any carrier that has failed to meet its performance requirements and believes that its

failure to do so is the result of a small sample size. As noted in this document, to minimize the burdens of testing, the Bureaus have used a “trip-wire” approach in determining the required sample sizes; while these sample sizes are useful for demonstrating where further inquiry may be helpful, they are subject to a high margin of error. Thus, if at the end of its term, a carrier is shown not to have met its deployment obligations due to a failure in meeting the speed and latency requirements, the carrier can submit a request to the Bureaus for an increased size of random samples that will produce an estimate with a margin of error of 5% or less and conduct further testing during the additional 12-month period provided in section 54.320(d)(2) to show that the carrier is compliance with the Commission’s performance requirements. If, after this further testing, the carrier is able to demonstrate that it fully complies with the required speed and latency benchmarks, then the carrier will be considered to have met the deployment obligations.

69. The Commission is persuaded by the record here to modify the specific schedule to commence speed and latency tests established in the *Performance Measures Order*. The *Performance Measures Order* established a deadline of July 1, 2020 for carriers subject to the *Performance Measures Order* to report the results of testing, with an accompanying certification, for the third and fourth quarters of 2019. The Commission now adopts a modified approach to enable better individualization to the specific circumstances of a given provider.

70. The Commission concludes that it is appropriate under the circumstances to modify the scheduled start of performance testing to link speed and latency testing to the deployment obligations for carriers receiving support from each of the various high-cost support mechanisms. The Commission believes this solution best balances its responsibility to ensure that consumers are receiving the promised levels of service in a timely manner with the ability of all carriers to undertake the required performance testing. This approach also allows larger price cap carriers that are further along in their deployments and are more able, at this point, to begin testing to do so without additional delay. Moreover, the rolling testing schedule the Commission adopts will be less administratively burdensome for Commission staff by allowing for more individualized review and evaluation of testing results over time. Pushing back testing will have the added benefit of allowing additional time for the marketplace to further develop

solutions for carriers to undertake the required testing.

71. The Commission also implements a pre-testing period that will occur prior to the commencement of each carrier's testing start date. As with the testing period, this pre-testing period will be aligned with a carrier's deployment obligations for the specific high-cost mechanism under which it receives support and will require the filing of data regarding pre-testing results. Pre-testing will require carriers to conduct testing according to the Commission's requirements using a USAC-determined random sample of subscribers, and results must be submitted to USAC within one week of the end of each quarter (i.e., by April 7 for the first quarter, July 7 for the second quarter, etc.).

72. However, no support reductions will be assessed during the pre-testing period, as long as carriers actually undertake the pre-testing and report their results. Carriers that fail to conduct pre-testing and submit results in a timely fashion will be considered to be at Level 1 non-compliance. The random sample for pre-testing can be used by the carrier for a total of two years, meaning that carriers will need to obtain a new random sample after two years of pre-testing/testing. Thus, for example, if a carrier does one year of pre-testing and then one year of testing, it will need to obtain a new random sample prior to beginning the second year of testing. While there will be no support reductions during the pre-testing period (as long as the carrier undertakes the testing and reports results), the filing will allow Commission staff to evaluate the pre-testing data and determine if any adjustments to the testing regime are needed to ensure that the testing period is successful. In addition, pre-testing will give carriers an opportunity to see how their networks and testing software and hardware perform and make any changes necessary. The Commission directs the Bureaus to amend the performance measures as appropriate based on the information learned and experience gained from the pre-testing period.

73. Several industry associations support the approach the Commission adopts to tie speed and latency testing to a carrier's deployment obligations for the specific high-cost program under which it receives support. Specifically, ITTA, USTelecom, and WISPA advocate aligning a carrier's performance obligations with its deployment obligations, as well as designating the first two quarters of testing as "transitional and not subject to non-compliance measures for any performance deficiencies" to allow

carriers to become familiar with the testing process. In addition, both NTCA and WTA support linking testing obligations to deployment obligations and allowing carriers to have a period of advanced testing before the mandated testing period. The Commission agrees with those commenters suggesting that a period to “test the testing” will help ensure that all carriers become familiar with testing methodologies and equipment, as well as prevent or reduce future administrative issues with the testing process.

74. Accordingly, the Commission adopts the schedule in the following for pre-testing and testing obligations specific to the carriers receiving high-cost universal service support:

Schedule for Pre-Testing and Testing

Program	Pre-testing start date	Testing start date
CAF Phase II (Price-cap carrier funding)	January 1, 2020	July 1, 2020
RBE	January 1, 2021	January 1, 2022
Alaska Plan	January 1, 2021	January 1, 2022
A-CAM I	January 1, 2021	January 1, 2022
A-CAM I Revised	January 1, 2021	January 1, 2022
ACAM II	January 1, 2022	January 1, 2023
Legacy Rate of Return	January 1, 2022	January 1, 2023
CAF II Auction	January 1, 2022	January 1, 2023
New NY Broadband Program	January 1, 2022	January 1, 2023

75. Because the Commission establishes pre-testing and testing periods to coincide with a carrier’s specific deployment obligations under its respective high-cost mechanism, recipients of CAF Phase II model-based support will be the first to undertake the pre-testing period on January 1, 2020. These carriers are required to build out to 80% of their supported locations by December 31, 2019. Recipients of CAF Phase II model-based support are primarily larger carriers that are better positioned to

begin testing sooner due to the availability of testing equipment and solutions already in the marketplace for these carriers. During the six-month pre-testing period, these carriers will be required to test the speed and latency of their networks for a weeklong period once per quarter (first and second quarters of 2020) and submit the results to the Commission within one week of the end of each quarter of pre-testing. The testing period for CAF Phase II model-based support recipients will commence on July 1, 2020, with speed and latency tests occurring for weeklong periods in both the third and fourth quarters of 2020 and results of that testing submitted by July 2021.

76. RBE support recipients, as well as rate-of-return carriers receiving model-based support under both the A-CAM I and the revised A-CAM I, will follow a similar, but slightly extended schedule. The pre-testing period for these carriers will commence on January 1, 2021 and will last one full year to ensure that the predominantly smaller carriers receiving support under these mechanisms have adequate time to implement and test their technology and software solutions to meet the Commission's performance testing requirements. The Commission believes that a longer pre-testing period than the one it adopts for CAF Phase II model-based support recipients is warranted to ensure that any concerns or issues with the testing process are addressed prior to these carriers being subject to support reductions. During this one-year pre-testing period, this group of carriers will be required to test the speed and latency of their networks quarterly for a weeklong period and submit the results to the Commission within one week of the end of each quarter of pre-testing. The testing period for these carriers will begin on January 1, 2022, and results will be submitted to the Commission by July 2023.

77. The Commission also adopts a one-year pre-testing period for recipients of support from the CAF Phase II auction and A-CAM II, as well as legacy rate-of-return support recipients. However, the Commission delays commencement of the pre-testing period for these carriers to account for certain timing considerations. For example, the Commission is in the process of authorizing CAF Phase II auction winners to receive support, and recently authorized rate-of-return carriers electing the A-CAM II offer to receive support. Additionally, to increase administrative efficiency, the Commission put legacy rate-of-return carriers on the same schedule as A-CAM II support recipients in light of the fact that their

deployment requirements started at approximately the same time. Thus, to allow time for carriers receiving support under these mechanisms not only to be authorized, but also to deploy in a timely manner, the Commission institutes a one-year pre-testing period beginning January 1, 2022. The required testing period for these carriers will commence on January 1, 2023. The Commission anticipates that these support recipients will have deployed to at least 40% of their required locations by the end of 2022. These carriers will be subject to the same testing and reporting requirements, for both pre-testing and testing, as the other categories of carriers described in this document, except that these carriers will have a one-year pre-test period rather than a six-month pre-test period.

78. The Commission disagrees with those petitioners urging it to adopt a blanket delay of implementation of the testing requirements. NTCA contends that the equipment necessary for the most cost-effective method of testing is not yet fully developed or widely available, particularly in rural markets. NTCA instead proposes that any obligations be suspended or waived until a later time—at least 12 months—following the widespread availability of modems with built-in testing capability to the rural market. WTA agrees that the necessary testing equipment is unavailable at this time and thus proposes that the Commission postpone testing for rural LECs for at least two years. WTA also proposes to delay support reductions for non-compliance to coincide with build-out milestones. WISPA, ITTA, and NTTA support proposals to postpone testing for a time in order to permit equipment to become more available and affordable.

79. The Commission is not convinced that a blanket delay for all carriers subject to its performance measure requirements is necessary. As petitioners and commenters observe, large carriers and carriers serving more urban markets are differently situated than smaller carriers serving more rural communities, and these carriers may already be positioned to begin testing. Though a minor delay for all carriers is warranted to allow USAC time to develop and implement specific IT solutions, additional time beyond that for the marketplace to develop technical solutions is necessary only for a certain subset of carriers. As WTA observes, “Whiteboxes for MBA testing are being used by large carriers, but thus far [its members] have generally been unable to obtain Whitebox pricing estimates for their likely levels of

demand.” Similarly, NTCA explains that larger carriers are able to purchase modems and routers at scale or can develop their own proprietary devices, but smaller carriers oftentimes must purchase “off the rack” technology solutions and may have already deployed equipment that cannot be easily retrofitted to accommodate performance testing.

80. The Commission agrees that a one-size-fits-all approach does not reflect the realities of the marketplace. However, the tiered implementation schedule the Commission adopts strikes a better balance between the interests of carriers in cost-effectively testing their networks’ performance and its need to ensure that those networks are performing at the level promised. The Commission further notes that WCB has already announced a delay in the requirement to begin testing and reporting of speed and latency results until the first quarter of 2020.

81. Given the changes to the testing framework the Commission adopts, it likewise declines WTA’s suggestion to delay support reductions for non-compliant carriers until they are given an opportunity to address any deficiencies in their networks. The pre-testing period the Commission adopts will provide carriers with ample opportunity to identify any issues within their network infrastructure that may impact testing results and to rectify those problems prior to undertaking the required testing. As a result, carriers should have minimal, if any, technological or software challenges that prevent them from meeting the Commission’s performance requirements and would require an opportunity to cure. Moreover, because carriers will be testing only those locations that the carrier has certified are deployed with the requisite speed, the Commission does not see a compelling reason to delay support reductions for non-compliance.

82. The Commission likewise declines to further delay testing and reporting obligations for Alaska Communications Systems (ACS). Because carriers serving certain non-contiguous areas of the United States face different operating conditions and challenges from those faced by carriers in the contiguous 48 states, the Commission concluded that it was appropriate to adopt tailored service obligations for each non-contiguous carrier that elected to continue to receive frozen support amounts for Phase II in lieu of the offer of model-based support. For ACS, the Commission adopted a 10-year term of

support to provide a minimum of 10/1 Mbps broadband service with a roundtrip provider network latency requirement of 100 ms or less to a minimum of 31,571 locations.

83. ITTA, USTelecom, and WISPA propose that testing and reporting obligations for ACS be delayed for one year from the date on which they begin for other CAF Phase II model-based support recipients. These parties contend that ACS should be given more time because it is still in the process of planning its CAF II deployment and has not identified or reported the specific customer locations that it intends to serve. ITTA, USTelecom, and WISPA also argue that additional time also is necessary for ACS to identify one or more suitable points at which traffic can be aggregated for transport to the continental U.S.

84. Because the Commission is instituting a pre-testing period and delaying the start of the required testing period for CAF Phase II model-based support recipients until July 1, 2020, the Commission anticipates that ACS will have had ample time to finalize deployment plans and identify a suitable aggregation point or points. Thus, the Commission is unconvinced by the argument advanced by ITTA, USTelecom, and WISPA that these issues warrant further delay for ACS. Moreover, the Commission notes that ACS already has passed its first deployment milestone and certified to locations in the HUBB. Thus, ACS should be fully prepared to commence testing on the same schedule as other CAF Phase II support recipients.

85. NTCA requests clarification that the *Performance Measures Order* applies only to high-cost recipients with mandatory build-out obligations. Though some Alaskan rate-of-return carriers are subject to defined build-out obligations, NTCA observes that if a carrier has “no mandated build-out obligation, there is neither a clear speed threshold to which a carrier can be required to test nor a specified number of locations at which the test can be conducted.” NTCA argues that additional proper notice-and-comment rulemaking procedures would be needed to subject carriers without mandatory build-out obligations to any required performance measures.

86. Absent any specific deployment requirements, the Commission lacks a standard for determining whether a carrier’s deployment meets the required performance measures. As a result,

consistent with NTCA's request, the Commission clarifies that only carriers subject to defined build-out requirements are required to test the speed and latency of their networks in accord with Commission rules. Alaskan rate-of-return carriers that have committed to maintaining existing service levels therefore are not subject to the performance measures adopted by the Bureaus and modified herein.

87. Alaskan rate-of-return carriers that have committed to defined build-out obligations, however, must conduct speed and latency testing of their networks. That said, the Commission recognizes that many of these carriers lack the ability to obtain terrestrial backhaul such as fiber, microwave, or other technologies and instead must rely exclusively on satellite backhaul. Consistent with the standards the Commission adopted for high-latency service providers in the CAF Phase II auction, it requires Alaska Plan carriers using satellite or satellite backhaul to certify that 95% or more of all testing hour measurements of network round trip latency are at or below 750 ms for any locations using satellite technology. The Commission also reaffirms that these carriers must certify annually that no terrestrial backhaul options exist, and that they are unable to satisfy the standard performance measures due to the limited functionality of the available satellite backhaul facilities. To the extent that new terrestrial backhaul facilities are constructed, or existing facilities improve sufficiently to meet the public interest obligations, the Commission has required funding recipients to meet the standard performance measures within twelve months of the new backhaul facilities becoming commercially available.

III. PROCEDURAL MATTERS

88. *Paperwork Reduction Act.* This document contains new information collection requirements subject to the Paperwork Reduction Act of 1995 (PRA), Public Law 104-13. It will be submitted to the Office of Management and Budget (OMB) for review under Section 3507(d) of the PRA. OMB, the general public, and other Federal agencies will be invited to comment on the new information collection requirements contained in this proceeding. In addition, the Commission notes that pursuant to the Small Business Paperwork Relief Act of 2002, Public Law 107-198, *see* 44 U.S.C. 3506(c)(4), the Commission previously sought specific comment on how it might further reduce the information collection burden for small business concerns with fewer than 25 employees.

89. Congressional *Review Act*. The Commission has determined, and the Administrator of the Office of Information and Regulatory Affairs, Office of Management and Budget, concurs that these rules are non-major under the Congressional Review Act, 5 U.S.C. 804(2). The Commission will send a copy of this Order on Reconsideration to Congress and the Government Accountability Office pursuant to 5 U.S.C. 801(a)(1)(A).

90. As required by the Regulatory Flexibility Act of 1980 (RFA), as amended, an Initial Regulatory Flexibility Analysis (IRFA) was incorporated in the *USF/ICC Transformation FNPRM*, 76 FR 78384, December 16, 2011. The Commission sought written public comment on the proposals in the *USF/ICC Transformation FNPRM*, including comment on the IRFA. The Bureaus included a Final Regulatory Flexibility Analysis (FRFA) in connection with the *Performance Measures Order*. This Supplemental Final Regulatory Flexibility Analysis (Supplemental FRFA) supplements the FRFA in the *Performance Measures Order* to reflect the actions taken in the Order on Reconsideration and conforms to the RFA.

91. The Order on Reconsideration addresses issues raised by parties in petitions for reconsideration and applications for review of the *Performance Measures Order*. In the *Performance Measures Order*, the Bureaus established how recipients of CAF support must test their broadband networks for compliance with speed and latency metrics and certify and report those results. In doing so, the Bureaus adopted a flexible framework to minimize the burden on small entities—for example, by permitting carriers to choose from one of three methodologies to conduct the required testing.

92. The Order on Reconsideration affirms certain key components of the Performance Measures Order while making several modifications to the requirements. Specifically, in the Order, the Commission maintains the choice between three testing methodologies for carriers to conduct required testing; tie the implementation of speed and latency testing to a carrier's deployment obligations for the specific high-cost program under which it receives support; adopt a pre-testing regime to give both carriers and the Commission the opportunity to ensure that carriers are familiar with the testing regime and minimize any administrative issues; maintain the previously-adopted testing sample sizes but clarify

that carriers must use the same locations for testing both latency and speed; adopt a revised definition of FCC-designated Internet Exchange Point (IXP); confirm that end-points for testing are from the customer's side of any network being used to an FCC-designated IXP; maintain the existing daily testing time period and quarterly testing requirement; allow further flexibility for the timing of speed tests but maintain the same frequency of latency testing; and reaffirm the compliance standards and associated support reductions for non-compliance.

93. There were no comments raised that specifically addressed how broadband service should be measured, as presented in the *USF/ICC Transformation FNPRM* IRFA. Nonetheless, the Commission has considered the potential impact of the rules proposed in the IRFA on small entities and reduced the compliance burden for all small entities in order to reduce the economic impact of the rules enacted herein on such entities.

94. The RFA directs agencies to provide a description of, and where feasible, an estimate of the number of small entities that may be affected by the proposed rules, if adopted. The RFA generally defines the term "small entity" as having the same meaning as the terms "small business," "small organization," and "small governmental jurisdiction." In addition, the term "small business" has the same meaning as the term "small-business concern" under the Small Business Act. 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).

95. As noted in this document, the *Performance Measures Order* included a FRFA. In that analysis, the Bureaus described in detail the small entities that might be significantly affected. Accordingly, in this FRFA, the Commission hereby incorporates by reference the descriptions and estimates of the number of small entities from the previous FRFA in the *Performance Measures Order*.

96. The Commission expects the amended requirements in the Order on Reconsideration will not impose any new or additional reporting or recordkeeping or other compliance obligations on small entities and, as described in the following, will reduce their costs.

97. The RFA requires an agency to describe any significant alternatives that it has considered

in reaching its proposed approach, which may include (among others) the following four alternatives:

(1) the establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities; (2) the clarification, consolidation, or simplification of compliance or reporting requirements under the rule for small entities; (3) the use of performance, rather than design, standards; and (4) an exemption from coverage of the rule, or any part thereof, for small entities.

98. The Commission has taken further steps which will minimize the economic impact on small entities. In the Order on Reconsideration, the Commission adopts a delayed schedule providing for a period of “pre-testing” for all carriers and later start dates for carriers that do not receive CAF Phase II model-based support. Thus, CAF Phase II model-based support recipients, which include only large carriers, must begin pre-testing and testing in 2020, whereas legacy rate-of-return carriers, many of which are smaller entities, must begin pre-testing in 2022 and testing in 2023, and small carriers receiving A-CAM I model support do not begin pre-testing until 2021 and testing in 2022. Pre-testing will give carriers time to correct any issues with their networks or with their testing infrastructure without being subject to support reductions, and the delayed schedule for non-CAF Phase II carriers will permit smaller entities even more time to prepare to meet the Commission’s testing requirements.

99. The Commission also now permits greater flexibility for carriers to conduct speed tests within an hour. In the Order on Reconsideration, the Commission clarifies that carriers may not necessarily start testing speed at the very beginning of each test hour. Instead, a carrier must simply report a successful speed test for each hour, except a carrier that begins attempting a speed test within the first 15 minutes of an hour and checks for cross-talk in one-minute intervals (using the cross-talk thresholds of 64 Kbps for download and 32 Kbps for upload) may record that no test was successful during that test hour.

100. Finally, the Commission clarifies that carriers may use the same subscriber locations for testing both speed and latency, halving the potential burdens for carriers that may have otherwise believed it necessary to test separate subscriber locations for speed and latency. This clarification is most

significant for the smallest carriers, which may use less automated means of testing than larger carriers.

IV. ORDERING CLAUSES

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, the Order on Reconsideration IS ADOPTED, effective thirty (30) days after publication of the text or summary thereof in the Federal Register, except for paragraphs 15, 16, 19, 22, 23, 26, 31 through 38, 43 through 49, 52, 53, 64, and 75 through 91, which contain new or modified information collection requirements, that will not be effective until approved by the Office of Management and Budget. The Commission will publish a document in the *Federal Register* announcing the effective date for those sections not yet effective. It is the Commission's intention in adopting these rules that if any of the rules that the Commission retains, modifies, or adopts in this document, 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.

101. 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 §§ 0.331 and 1.429 of the Commission's rules, 47 CFR 0.331 and 47 CFR 1.429, the Petition for Reconsideration and Clarification filed by USTELECOM – THE BROADBAND ASSOCIATION, ITTA – THE VOICE OF AMERICA'S BROADBAND PROVIDERS, and the WIRELESS INTERNET SERVICE PROVIDERS ASSOCIATION on September 19, 2018 IS GRANTED IN PART and DENIED IN PART to the extent described herein, and the Petition for Partial Reconsideration filed by MICRONESIAN TELECOMMUNICATIONS CORPORATION on September 19, 2018 IS DENIED.

102. IT IS FURTHER ORDERED that, pursuant to the authority contained in 5(c)(5) of the Communications Act of 1934, as amended, 47 U.S.C. 155(c)(5), and § 1.115(g) of the Commission's rules, 47 CFR 1.115(g), the Application for Review and Request for Clarification filed by NTCA – THE

RURAL BROADBAND ASSOCIATION on September 19, 2018 and the Application for Review filed by WTA – ADVOCATES FOR BROADBAND on September 19, 2018, ARE GRANTED IN PART and DENIED IN PART to the extent described herein.

List of Subjects in 47 CFR Part 54

Communications common carriers, Health facilities, Infants and children, Internet, Libraries, Reporting and recordkeeping requirements, Schools, Telecommunications, Telephone.
Federal Communications Commission.

Marlene Dortch,
Secretary.

Final Rules

For the reasons discussed in the preamble, the Federal Communications Commission amends 47 CFR part 54 as follows:

PART 54 – UNIVERSAL SERVICE

1. The authority for part 54 continues to read as follows:

Authority: 47 U.S.C. 151, 154(i), 155, 201, 205, 214, 219, 220, 254, 303(r), 403, and 1302, unless otherwise noted.

2. Amend § 54.320 by revising paragraphs (d)(1)(ii) and (iii), the first sentence of paragraph (d)(1)(iv)(A) and paragraph (d)(2) to read as follows:

§ 54.320 Compliance and recordkeeping for the high-cost program.

* * * * *

(d) * * *

(1) * * *

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(ii) *Tier 2*. If an eligible telecommunications carrier has a compliance gap of at least 15 percent but less than 25 percent of the number of locations that the eligible telecommunications carrier is required to have built out to or, in the case of Alaska Plan mobile-carrier participants, population covered by the specified technology, middle mile, and speed of service in the carrier's approved performance plan, by the interim milestone, USAC will withhold 15 percent of the eligible telecommunications carrier's monthly support for that support area and the eligible telecommunications carrier will be required to file quarterly reports. Once the eligible telecommunications carrier has reported that it has reduced the compliance gap to less than 15 percent of the required number of locations (or population, if applicable) for that interim milestone for that support area, the Wireline Competition Bureau or Wireless Telecommunications Bureau will issue a letter to that effect, USAC will stop withholding support, and the eligible telecommunications carrier will receive all of the support that had been withheld. The eligible telecommunications carrier will then move to Tier 1 status.

(iii) *Tier 3*. If an eligible telecommunications carrier has a compliance gap of at least 25 percent but less than 50 percent of the number of locations that the eligible telecommunications carrier is required to have built out to by the interim milestone, or, in the case of Alaska Plan mobile-carrier participants, population covered by the specified technology, middle mile, and speed of service in the carrier's approved performance plan, USAC will withhold 25 percent of the eligible telecommunications carrier's monthly support for that support area and the eligible telecommunications carrier will be required to file quarterly reports. Once the eligible telecommunications carrier has reported that it has reduced the compliance gap to less than 25 percent of the required number of locations (or population, if applicable) for that interim milestone for that support area, the Wireline Competition Bureau or Wireless Telecommunications Bureau will issue a letter to that effect, the eligible telecommunications carrier will move to Tier 2 status.

(iv) * * *

(A) USAC will withhold 50 percent of the eligible telecommunications carrier's monthly support for that support area, and the eligible telecommunications carrier will be required to file quarterly reports. *

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(2) *Final milestone*. Upon notification that the eligible telecommunications carrier has not met a final milestone, the eligible telecommunications carrier will have twelve months from the date of the final milestone deadline to come into full compliance with this milestone. If the eligible telecommunications carrier does not report that it has come into full compliance with this milestone within twelve months, the Wireline Competition Bureau - or Wireless Telecommunications Bureau in the case of mobile carrier participants - will issue a letter to this effect. In the case of Alaska Plan mobile carrier participants, USAC will then recover the percentage of support that is equal to 1.89 times the average amount of support per location received by that carrier over the support term for the relevant percentage of population. For other recipients of high-cost support, USAC will then recover the percentage of support that is equal to 1.89 times the average amount of support per location received in the support area for that carrier over the term

of support for the relevant number of locations plus 10 percent of the eligible telecommunications carrier's total relevant high-cost support over the support term for that support area. Where a recipient is unable to demonstrate compliance with a final performance testing milestone, USAC will recover the percentage of support that is equal to 1.89 times the average amount of support per location received in the support area for the relevant number of locations for that carrier plus 10 percent of the eligible telecommunications carrier's total relevant high cost-support over the support term for that support area, the total of which will then be multiplied by the percentage of time since the carrier was last able to demonstrate compliance based on performance testing, on a quarterly basis. In the event that a recipient fails to meet a final milestone both for build-out and performance compliance, USAC will recover the total of the percentage of support that is equal to 1.89 times the average amount of support per location received by that carrier over the support term for the relevant number of locations to which the carrier failed to build out; the percentage of support that is equal to 1.89 times the average amount of support per location received in the support area for the relevant number of locations for that carrier multiplied by the percentage of time since the carrier was last able to demonstrate compliance based on performance testing; and 10 percent of the eligible telecommunications carrier's total relevant high-cost support over the support term for that support area.

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