

## **Vermont Comments on NTIA's Proposed BEAD Alternative Broadband Technology Guidance – September 10, 2024**

The Staff of the Vermont Community Broadband Board (VCBB Staff) welcomes the opportunity to submit comments related to the NTIA's Proposed BEAD Alternative Broadband Technology Guidance. This proposed guidance provides a framework for how Eligible Entities may deploy alternative technologies when fiber is cost-prohibitive, as is likely to be the case in many off-grid areas. VCBB Staff believe the decision hierarchy the NTIA has developed to govern the deployment of such technologies is an effective framework if, and only if, the NTIA recognizes the unique challenges and circumstances of each State and allows flexibility in the deployment of all technologies.

### **The Challenge Process and the Hierarchy of Technologies**

Vermont, like many states, declared all locations served by obsolete DSL technology as eligible during the challenge process. VCBB Staff believe the only appropriate use for this technology is for sub-kilometer drops from fiber lines up and only when contained in conduit (see Christine Hallquist - Performance Curve).<sup>i</sup>

Furthermore, Vermont also deployed a pre-challenge modification to remove cellular fixed wireless locations due to concerns over capacity, Vermont's history with the technology, and hurdles posed by Vermont's topography and foliage. To rebut this modification, wireless companies were required to data on capacity backed by rigorous testing. No such rebuttals were submitted. See wireless challenges in Vermont as outlined by Christine Hallquist.<sup>ii</sup>

Given VCBB Staff's purposeful decision to declare addresses served by these technologies as eligible addresses, the NTIA requirement to consider these technologies months earlier declared insufficient and ineffective if a proposal is only 99% rather than 100% fiber-optic is nonsensical. This hurts the credibility of the Eligible Entity and the BEAD program. If an Eligible Entity previously declared that certain technologies don't work in the state, those technologies should be only considered on par with Alternative Technologies, such as LEO and Unlicensed Wireless. BEAD costs must be "reasonable, necessary, allocable, and allowable." VCBB Staff finds the inclusion of these technologies only appropriate if considered on par with LEO.

### **Maximizing Fiber Deployment & The Hierarchy of Technologies**

Fiber is the preferred technology throughout the IIJA and the BEAD NOFO. This should be

reflected in the Policy Notice Background and Purpose Section and in the hierarchy of when alternative technologies can be considered. Vermont built its plans around this goal. Promoting Priority Broadband Projects and fiber to as many locations as possible should be the priority before any use of other reliable service or alternative technologies. Furthermore, Eligible entities should have the discretion to consider to a Hybrid Fiber plus minimal Alternative technologies, such as Low Earth Orbit Satellite, are considered when the cost of deploying fiber (as opposed to any “reliable technology”) exceeds the Extremely High Cost Per Location Threshold (EHCPLT) if such a decision is made to maximize fiber deployment. The public interest is best served when the maximum number of BSLs are served with fiber rather than inferior, but “reliable” technologies. A more detailed explanation and proposed process is described in the end notes.<sup>iii</sup>

Also, if a Priority Project exceeds the EHCPT, the Eligible Entity should be able to look to other Reliable AND Alternative Technologies to serve 3-5% of the addresses without such project losing its Priority Status. This could be accomplished through the creation of a separate project area or direct negotiations. The VCBB Staff requests that all policy guidance issued by the NTIA provide flexibility. The end goal should be to serve the most BSLs possible with fiber.

### **Maximizing Fiber Deployment Where an Existing Alternative or Reliable Technology Currently Meets the BEAD Program requirements (Section 3.2).**

The NTIA’s Model Challenge Process set an end date for Planned Projects of June 30, 2024. After this date, providers have continued to build reliable networks. Eligible Entities must be given the discretion not to fund locations on their approved list of eligible locations that have access to a reliable or alternative technology at the time the Final Proposal is submitted to the NTIA. This process could be accomplished either through a waiver request or through the process described in 3.1 but should be inclusive of all technologies.

Furthermore, if the Eligible Entity is required to accept as “reliable” technologies removed during the Challenge Process (DSL and Wireless), the entity should be able to accept that those locations are in effect served to maintain an area as a Priority, Fiber-Only Project Area before having to review and score proposals from other Reliable Technologies.

### **Failing Fast vs Four Years to Deploy**

For an Alternative Technology to be accepted, they must be able to demonstrate it is available at the required performance now. The NTIA much provide an Eligible Entity discretion when determining the period of time allowed for deployment and/or the inclusion of a requirement of a proof-of-concept demonstration project before an award is

made. If the timeline is not adjusted, in the guidance, the NTIA must detail what happens in four years if a provider has failed to meet a promised level of service. The NTIA should also provide a model for testing in advance nonexistent wireless and/or LEO service to ensure it meets the required deployment performance standards.

### **Criteria for Reviewing Technical Capability**

VCBB Staff agrees and is encouraged by footnote 27. Eligible Entities must be permitted to establish criteria for reviewing technical capability, such as requiring evidence consistent with the Eligible Entity Challenge Process standards. VCBB Staff strongly feels this review is a must for the deployment of all reliable and alternative technologies. Furthermore, VCBB Staff urges the NTIA to require per location testing that aligns with the criteria similar to the challenge process before any payment is issued. Eligible Entities should be given the discretion to require high spatial sample ratios for testing of both Alternative Technologies and all Reliable Technologies.

### **Reservation of Capacity - Not Paying for Never-to-be-used Capacity**

VCBB Staff appreciates the flexibility to use BEAD funds for the reservation of network capacity. Additional guidance is required regarding the reimbursement schedule of LEO Capacity Subgrant recipients and how it can be tied to specific subscriber milestones. The NTIA should consider applying the same standard for other types of deployments that require a single infrastructure deployment to provide for service multiple customers where that LEO or any wireless, as opposed to fiber or coaxial.

The consideration of subscribers helps address another challenge facing Eligible Entities. Many locations listed as BSLs may, in reality never subscribe to service and it would be a waste to dedicate taxpayer resources to such locations. The FCC National Broadband Map is still a work in progress. The map is full of locations such as a hunting cabin used a few weeks per year where paid service will never be subscribed to especially if using a cell phone as a hot spot is an option for getting online. Spending funds on such locations degrades the level of service available elsewhere. The NTIA must issue explicit and flexible guidance detailing how an Eligible Entity can justify not funding a location. This guidance should not be dependent on high barriers such as the sign off from each individual property owner that they do not want service or a mischaracterized BSL. An NTIA decision to prioritize BEAD funding on occupied BSLs would be welcomed by VCBB Staff as a rational and useful tool for ensuring that Vermont can meet its BEAD obligations and prioritize fiber broadband. Why would we treat the mother with three children the same as a guy who uses a hunting cabin three times per year and would never sign up for service?

Please provide guidance on how an eligible entity should calculate the amount of funds to reserve for a such a purpose over the course of the ten-year performance period

### **Ensuring Alternative Technology Deployment Does Not Slow Priority or Reliable Deployment**

In Appendix A; #5, the NTIA explains that other subgrants can be closed out earlier than the LEO Capacity Subgrants. While this is helpful in reducing administrative burden, this fails to address the burden and opportunity costs of the extended period of time necessary to conduct a full selection process. The NTIA should permit the submission of a Final Proposal while commitments from Alternative Providers are being negotiated. This would spread the administrative burden posed by “cleaning up” the remaining difficult to serve addresses over a longer period of time and more importantly allow the priority projects and other reliable technology process proceed without delay. The existence of addresses where a service provider has not been found must not become a barrier to the deploy of priority or reliable service elsewhere.

### **Administrative Burden**

VCBB Staff strongly agrees with the need for performance monitoring of all deployments, alternative or reliable, but this additional extended requirement is an unfunded mandate on the Eligible Entity that will require Eligible Entities to continue employing staff and consultants for years in the future. To reduce the administrative burden after all other subgrants have been closed out and to ensure capacity exists for continued performance monitoring, the NTIA should provide additional state capacity grants using funds from RDOF defaults. To do otherwise, is unacceptable.

### **Conclusion**

VCBB Staff appreciates the ability to comment on this important issue and urges the NTIA to quickly issue Final Guidance.

Finally, VCBB Staff urges the NTIA to expedite all future BEAD guidance or to provide additional flexibility to states who have already received permission to proceed. Delays in issuing guidance and revisions of prior guidance are creating uncertainty and delays.

We thank the NTIA for their openness to considering the unique circumstances of each Eligible Entity. With the NTIA’s continue support, Vermont is well on its way towards implementing a strategy that will provide Vermonters with reliable, symmetrical, future-

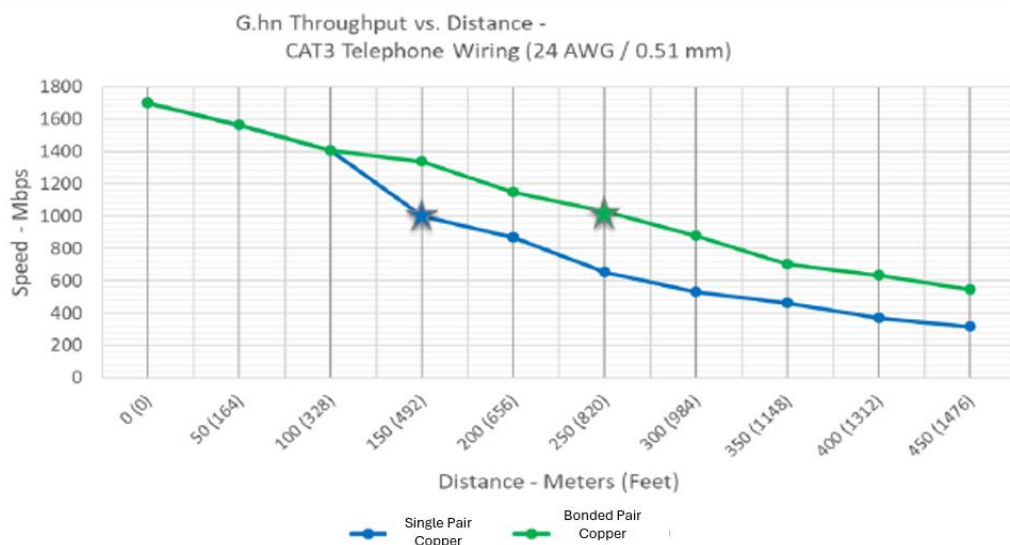
proof broadband along with accountability and performance standards that protect Vermonters.

Thank you for your consideration.

Sincerely,

Rob Fish, Deputy Director of the Vermont Community Broadband Board

Christine Hallquist, Executive Director of the Vermont Community Broadband Board



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ii Vermont is concerned about the speeds and latencies that terrestrial fixed wireless technologies can reliably provide during periods of dense foliage. Therefore, the VCBB believes it is paramount that speed tests are conducted when leaves are on the trees, or that speed tests taken when leaves are not on the trees show results that are sufficiently fast to justify that speeds of 100/20 Mbps or greater would be expected at a time of peak foliage coverage. Should entities wish to dispute the modification of these addresses as underserved, they will be required to submit tests conducted during a period of foliage in 2023 no more than 180 days prior to the start of the challenge process, or to justify that speed tests are 40% better in fall and winter months when leaves are not on trees,

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to demonstrate that speeds of 100/20 Mbps or greater would be available during times of peak foliage coverage.

Based on ITU and IEEE publications, non-line-of-sight (non-LOS) propagation at frequencies between 600 MHz to 3.65 GHz experience between 20% to 40% more attenuation through trees.

1. International Telecommunication Union Radiocommunications Sector. Recommendation ITU-R P.833-10, "Attenuation in vegetation," September 2021. Available at [https://www.itu.int/dms\\_pubrec/itu-r/rec/p/R-REC-P.833-10-202109-!!!PDF-E.pdf](https://www.itu.int/dms_pubrec/itu-r/rec/p/R-REC-P.833-10-202109-!!!PDF-E.pdf).

2. An Accurate Empirical Path Loss Model for Heterogeneous Fixed Wireless Networks Below 5.8 GHz Frequencies, Published Sept 2020 in IEEE Access. Available at <https://ieeexplore.ieee.org/abstract/document/9193927>

Oversubscription in fixed wireless networks is particularly challenging due to the inherent variability of wireless connections. Signal attenuation from obstacles such as trees and buildings can weaken the signal, meaning that some customers require more transmission power and repeated data packets. Additionally, multipath interference, where signals bounce off obstacles, results in the tower sending data multiple times, further consuming the bandwidth. In shared frequency bands, noise and interference from other devices or even other wireless systems can disrupt service. Also, the physical clustering of users in weak coverage zones can strain beamforming capabilities, leading to uneven service distribution. Managing traffic in fixed wireless scenarios is complex due to the dynamic nature of wireless conditions. Users in weak coverage areas often communicate more with the tower, sending frequent feedback such as signal quality reports, handshaking, and error corrections. This feedback overhead, while essential for maintaining connectivity, consumes valuable tower resources and bandwidth. Interference, especially in shared bands, not only affects individual users but can also disrupt the overall traffic flow, causing network congestion. Algorithms designed to ensure fair bandwidth distribution across users can get taxed when trying to balance between strong and weak connections. Overcompensating for weak-signal users can diminish performance for those with strong signals, making it challenging to guarantee consistent service levels. The unpredictable nature of wireless connections, compounded by environmental and interference factors, necessitates sophisticated traffic management strategies and the disclosure of oversubscription and traffic management methods used by the fixed wireless provider.

Furthermore, Vermont sees Unlicensed Fixed Wireless a lower priority solution due to narrower and unpredictable signal to noise ratios.

<sup>iii</sup> The process would be as follows: Eligible Entity reviews and negotiates with eligible providers that submitted a Priority Project. If a negotiation is unable to achieve a price below the EHCPLT, the Eligible Entity can take the following action. 1) Review locations removed during the Challenge Process, the NTIA is forcing the Eligible Entities to consider as Reliable Technology. The entity then may remove those locations from the project area and contract with the Provider that submitted a Priority Proposal if the removal of those addresses brings the overall project cost below the

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EHCPPT; 2) Review the current deployment of Alternative Technologies and remove such locations from the project area. The Eligible Entity then may remove those locations from the project area and contract with the Provider that submitted a Priority Proposal if the removal of those addresses brings the overall project cost below the EHCPLT. 3) If the previous processes fail to identify existing service, then the Eligible Entity can review deployments of other Reliable Technologies and Score all projects as a Non-Priority Project.

As an alternative, the Eligible Entity should be provided the option to create a new project area composed of addresses that result in a Priority Project exceeding the EHCT. This is another way to ensure that the most reliable and future proof technology is deployed at each individual location.

This is the only way to ensure that all costs are “reasonable, necessary, allocable” and to stay true the goal of ensuring as many residents benefit from fiber as possible.