

**BEFORE THE PUBLIC UTILITIES  
COMMISSION OF THE STATE OF CALIFORNIA**

Order Instituting Rulemaking Proceeding to  
Consider Rules to Implement the Broadband  
Equity, Access, and Deployment Program

Rulemaking 23-02-016  
(Filed February 23, 2023)

**OPENING COMMENTS OF TARANA WIRELESS, INC. ON BEAD  
STAFF PROPOSAL**

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**COMMENTS OF TARANA WIRELESS, INC. ON BEAD STAFF  
PROPOSAL**

**I. Introduction**

Tarana Wireless, Inc. ("Tarana Wireless" or the "Company") is a next generation Fixed Wireless Access ("ngFWA") technology company that produces hardware and software used by internet service providers to provide reliable, high-speed broadband in the United States and around the world. Headquartered in the Bay Area, Tarana Wireless was created by three UC Berkeley PhD students who came from communities deeply impacted by the digital divide. These shared experiences informed their determination and decision to create an innovative technology solution to bring reliable high-speed internet to families and communities. After 14 years of research and development, and now two full years of sales, Tarana Wireless' ngFWA technology is used by nearly 300 internet service providers in 45 U.S. states and 21 countries to deliver proven broadband service. In just over two years, Tarana Wireless' proven award-winning technologies serve tens of thousands of families with 1,500 to 2,000 new subscribers added every week. Numerous internet service providers in California have used state funds to deploy ngFWA technology and deliver broadband internet to diverse communities at or above Federal Communications Commission's speed standards of 100/20 Mbps.

Tarana Wireless supports the Commission's efforts to develop a Broadband Equity, Access, and Deployment ("BEAD") strategy that looks to bring Californians on the right side of

the digital divide. Tarana Wireless, Inc. is working with subgrantees and eligible entities as they prepare to obtain Broadband Equity, Access, and Deployment Program (“BEAD”) funding. Based on Tarana Wireless’ deep expertise in ngFWA technologies and experience in working with internet service providers in California, the Company respectfully submits these comments in response to certain questions posed in the Administrative Law Judge’s Ruling Issuing Staff Proposal published on November 7th, as well as specific questions posed in Initial Proposal Volume II.

## **II. Questions**

### **1. Do the proposed rules comply with federal requirements?**

No. Tarana Wireless does not believe the proposed rules comply with federal requirements. Tarana Wireless objects to the CPUC’s desire to prioritize the amount of fiber infrastructure deployed as it will fail to achieve coverage of all unserved locations in California, let alone the hundreds of thousands of underserved Californians.<sup>1</sup> Coverage of a substantial portion of unserved locations, at the expense of funding reliable, eligible, non-fiber technologies that provide fiber-class speeds to expand coverage to the underserved and Community Anchor Institutions (CAIs), or vital digital equity work, should not be the CPUC’s goal. This exhaustion of California’s finite BEAD allocation while failing to account for other critical components of the BEAD program is inappropriate and risks permanently leaving hundreds of thousands of Californians on the losing side of the digital divide. While the CPUC cites Page 41 of the BEAD Notice of Funding Opportunity<sup>2</sup> (“NOFO”) to justify proposing a plan that solely targets unserved BSLs, the CPUC fails to acknowledge outright that it is “financially incapable of ensuring universal coverage of all unserved and underserved locations.”<sup>3</sup> If the CPUC will not be able to achieve service to underserved California families and CAIs, we urge the CPUC to publish an iteration of Volume II that is transparent about its proposed strategy to only extend broadband service to the unserved. This would align with the BEAD NOFO and give a better sense to California families and taxpayers how the CPUC plans to allocate \$1.86 billion.

### **2. Should the Commission adopt the proposed rules?**

Tarana Wireless encourages the CPUC to make changes to Volume I and Volume II of the Initial Proposal based on our comments.

For Volume I, Tarana Wireless believes that the CPUC should not pursue the “low-speed fixed

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<sup>1</sup> Volume II, pg. 34

<sup>2</sup> NTIA Notice of Funding Opportunity for Broadband Equity, Access and Deployment Program (hereinafter “NOFO”).

<sup>3</sup> NOFO, pg. 41

wireless modification”<sup>4</sup> which will add more BSLs (broadband serviceable locations) to the unserved locations eligible for priority service. As the CPUC has noted in Volume II, the state’s BEAD allocation will likely be able to provide fiber optic infrastructure “to a substantial portion of unserved locations in California.”<sup>5</sup> Adding additional BSLs that are not necessarily unserved will serve to strain finite resources that jeopardize the CPUC’s chances of meeting the goal of 100% universal service clearly stated in the BEAD NOFO, particularly if the CPUC continues to solely focus on a strict fiber-to-the-premises (FTTP) approach. Moreover, as a point of clarification, Tarana Wireless would like to emphasize that fixed wireless access (FWA) technology has evolved beyond the limitations described by the CPUC in their proposed decision to modify the status of BSLs receiving broadband service via “low-speed fixed wireless.” Tarana Wireless, a next-generation Fixed Wireless Access (ngFWA) technology company, has developed proven hardware and software technologies which overcome line-of-sight obstructions and disruptive interference to provide reliable, high-speed broadband service to hundreds of homes off of a single base node<sup>6</sup>.

While traditional fixed wireless systems, such as those utilizing 3GPP or WiFi technologies, may struggle to maintain reliable broadband service in inclement weather, Tarana Wireless' next-generation Fixed Wireless Access (ngFWA) technology has effectively overcome these challenges in thousands of deployments around the country and throughout the world. As California looks to make investments in broadband infrastructure that is climate resilient, it should also ensure that any funded fixed wireless project is robust to adverse weather.

Legacy fixed wireless systems often face issues like absorption and attenuation, where shorter wavelengths are absorbed or scattered by water molecules and atmospheric moisture. Additionally, rain, snow and fog can cause scattering and reflection, particularly in higher millimeter-wave (mmWave) bands like 60 GHz, leading to signal deviation and degradation. The molecular resonance of oxygen in the air further contributes to attenuation at 60 GHz. Tarana Wireless addresses these limitations by operating in the 3 GHz, 5 GHz, and 6 GHz bands, thereby avoiding the adverse effects associated with higher frequencies.

In high wind situations, broadband service delivered by traditional fixed wireless technologies is often compromised as wind movement can introduce obstacles like tree branches or debris into the signal path. Continuous optimization of our beamforming technology ensures that our base node, situated on a vertical asset, maintains the strongest signal and connection to the remote node on a customer's home or business. Our system rapidly calculates alternative paths around these obstructions at a rate of 5,000 times

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<sup>4</sup> Volume I, pg. 9

<sup>5</sup> Volume II, pg. 34

<sup>6</sup> See Tarana Wireless Executive Summary. [https://privateapi.taranawireless.com/storage/resource\\_files/tarana-papers/1698832515\\_Tarana-Exec-Summary-2023.10.pdf](https://privateapi.taranawireless.com/storage/resource_files/tarana-papers/1698832515_Tarana-Exec-Summary-2023.10.pdf)

per second, ensuring seamless adaptation to changes without the subscriber even realizing something has occurred<sup>7</sup>.

In adverse weather conditions, where traditional fixed wireless systems may encounter challenges, Tarana Wireless' ngFWA technology remains steadfast in delivering dependable, high-speed broadband service.

High-frequency wireless technology, while capable of providing high speeds, typically covers shorter distances, resulting in higher costs. Unlicensed frequency bands may be considered less reliable due to potential interference affecting performance over time. Even mobile networks in licensed spectrum face resource contention, albeit in a managed manner. With the introduction of ngFWA, dozens of internet service providers in California alone use our technology today to serve thousands of California families with fast, robust, and reliable broadband internet. Watch our April 18th Sacramento live technology demonstration video (3 minutes 50 seconds), where we achieved speeds of 422/86 Mbps, even in the face of interference and obstructive elements.<sup>8</sup> On July 24th, Tarana Wireless hosted NTIA Assistant Secretary Alan Davidson in Palo Alto at a live technology demonstration exhibiting speeds of 415/95 Mbps in a non-line-of-sight link at 5.2 miles.<sup>9</sup> This proven ngFWA technology is now serving communities in 21 countries and 45 states, in partnership with nearly 300 Internet Service Provider (ISP) partners/customers.

With regards to Volume II, Tarana Wireless is deeply concerned that the CPUC will fail to meet the clear goals of the NTIA's BEAD Notice of Funding Opportunity to achieve 100% universal service to unserved BSLs, underserved BSLs, and Community Anchor Institutions (CAIs) in the state of California. The NTIA requires that each state develop a plan to ensure 100% universal service in order for the state to receive its BEAD allocation. While the CPUC acknowledges the goal to, "Ensure every Californian has access to quality, reliable, high-speed internet,"<sup>10</sup> the CPUC's prioritization of deploying end-to-end fiber infrastructure is clear that the cost of universal service will exceed California's BEAD allocation. Moreover, the CPUC's prioritization of fiber optic infrastructure deployment will prevent the CPUC from allocating money to important digital equity work, which was a crucial component of the BEAD program's mandate. By utilizing a holistic mix of technologies that meet (or preferably exceed), the CPUC can stretch California's BEAD award to ensure that all components of the BEAD program's requirements are met.

Originally, the NTIA concept for project areas envisioned bids being exclusively either all fiber or all "other" technologies. However, this approach presents challenges in defining areas, as there may be a subset of broadband serviceable locations (BSLs) that would not typically justify fiber deployment, juxtaposed with another set that can be readily served. States have sought to reconcile the conflict created

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<sup>7</sup> Tarana Wireless Executive Summary

<sup>8</sup> [https://www.youtube.com/watch?v=qNZ\\_86tA1rM](https://www.youtube.com/watch?v=qNZ_86tA1rM)

<sup>9</sup> <https://www.youtube.com/watch?v=CW73BClJbSw>

<sup>10</sup> Volume II, Pg. 4

by the NTIA’s apparent preference for fiber, against the mandate of the BEAD program to achieve 100% universal service. Missouri<sup>11</sup> and Kansas<sup>12</sup> are but two examples of states that have notably offered suggestions to the NTIA to allow providers to bid a mixture of technologies (e.g., fiber and fixed wireless) for a given project area to ensure coverage of every single unserved and underserved BSL. This hybrid approach allows providers to extend fiber service to as many households as possible while using less-expensive but similarly robust technologies to provide service to a certain percentage of hard-to-reach BSLs that are most expensive but difficult to serve with fiber. To uphold a preference for fiber, it is crucial to establish both a ceiling on the number of non-fiber locations allowed per area and a performance floor to ensure that service for the entire area maintains a "fiber-like" quality. One potential rule to consider is allowing up to 20% of the BSLs in an area to be served with non-fiber reliable infrastructure, provided that the performance of these locations exceeds 200/50Mbps or even 400/100 Mbps. This approach is likely to attract more bidders per area while ensuring that resources are efficiently allocated, especially in addressing challenging locations within an area that might otherwise impede overall coverage extension.

In addition, we recommend that the CPUC update its scoring criteria for the “Technical Capability” component of the BEAD program. Within the existing scoring framework, we would recommend that For Other Last-Mile Broadband Deployment Projects only, applicants will be awarded up to 4 points for offering a plan capable of surpassing the 100/20 Mbps performance floor. A score of 4 points is granted for a network speed equal to or exceeding 1000 Mbps (download) and 250 Mbps (upload) with a latency under 100 milliseconds (“ms”). Achieving a network speed of at least 400 Mbps (download) and 200 Mbps (upload) with latency under 100 ms results in 3 points. For network speeds meeting or surpassing 200 Mbps (download) and 50 Mbps (upload) with latency under 100 ms, 2 points are awarded. A network speed greater than 100 Mbps (download) and 20 Mbps (upload) with latency under 100 ms earns 1 point. Finally, meeting the criteria of exactly 100 Mbps (download) and 20 Mbps (upload) with a latency under 100 ms results in 0 points. To incentivize the selection of projects that employ and deploy these advanced networks, the state should implement specific scoring criteria that accurately reflect the qualities of these next-generation technologies. Establishing clear and objective criteria to evaluate the performance characteristics desired by California families is crucial. Therefore, we recommend that the CPUC incorporate performance/speed tiers into the scoring system, encouraging providers to deploy technologies that exceed the 100/20 Mbps speed minimum set by the NTIA.

The goal of the BEAD program is clearly stated in the title of the law: “Internet for All” not “Internet for Some.” Utilizing the right mix of technologies on a level playing field can ensure all

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<sup>11</sup> Missouri BEAD Initial Proposal Volume 2, pg. 35 <https://ded.mo.gov/media/pdf/bead-initial-proposal-volume-2>

<sup>12</sup> Kansas BEAD Initial Proposal Volume 2, pg. 30 [https://www.kansascommerce.gov/wp-content/uploads/2021/04/1-BEAD-IP-Vol2\\_for-Public-Comment\\_20231011.2.pdf](https://www.kansascommerce.gov/wp-content/uploads/2021/04/1-BEAD-IP-Vol2_for-Public-Comment_20231011.2.pdf)

Californians have access to reliable high-speed broadband internet.

**3. Are there some proposed rules that comply with federal requirements but should be modified? If yes, how would parties modify the proposal? Are there specific portions of the proposal the Commission should not adopt?**

Tarana Wireless reserves the right to respond to Question 3 in its Reply Comments

**4. Any additional questions asked in the Staff Proposal**

Tarana Wireless is responding to the stated questions in Volume II of the Initial Proposal which requested public comments on the matters of Project Areas and the Extremely High Cost Per Location Threshold.

In Volume II of the BEAD Initial Proposal, the CPUC requested public comment on whether the BEAD program should allow applicants to define Project Areas (Option 1) or allow Project Areas to be based on established boundaries (Option 2). Tarana Wireless believes that the CPUC should move forward with Option 2 and look to create Project Area boundaries defined by established jurisdictional boundaries. Non-political boundaries set by the CPUC can ensure that providers do not craft project applications that “cherry pick” broadband serviceable locations (BSLs) that make business sense while failing to provide service to those BSLs which may be more expensive to serve. Of equal importance to the effectiveness of setting project areas is ensuring that a prospective subgrantee commits to serve 100% of BSLs in a project area. Allowing providers to propose a mixture of reliable broadband technologies (e.g. fiber and licensed fixed wireless) will facilitate this process.

In Volume II of the BEAD Initial Proposal, the CPUC requested public comment on whether the CPUC should set an EHCPLT based on BEAD application data (Option 1) or set an EHCPLT prior to the BEAD application window (Option 2). Tarana Wireless emphatically supports Option 1, which we believe will best reflect true market prices for deploying fiber infrastructure. However, we are concerned that the CPUC will still look to “prioritize an EHCPLT as high as feasible to ensure greater fiber coverage” (pg. 42). We question why the CPUC would look to set an EHCPLT as high as possible when Volume II readily admits that the CPUC will struggle to achieve service to unserved BSLs utilizing a fiber-to-the-premises approach. The CPUC will have to utilize a mixture of technologies that can ensure it is able to meet the BEAD NOFO’s clear goals of providing service to unserved BSLs, underserved BSLs, and Community Anchor Institutions. A high EHCPLT which overly relies on fiber will jeopardize connectivity for Californians and deplete financing that should be used for important digital equity initiatives. As Tarana Wireless has suggested, and other states are pursuing, California should look to allow providers to submit applications using a mixture of technologies that optimize California’s finite dollars to deploy fiber where it makes sense and utilizing alternate reliable broadband technologies to achieve 100% universal service in

a project area.

### **III. Conclusion**

Tarana Wireless, Inc.'s thanks the Commission for the opportunity to file Opening Comments as to the Staff Proposal, and to register its desire for the Commission to provide a holistic broadband strategy that utilizes multiple technologies as appropriate to provide needed broadband service to all Californians.

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Respectfully submitted,

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