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**CRAIG SETTLES
COMMUNITY BROADBAND SNAPSHOT REPORT**

BE ALL YOU CAN BEAD



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INTRO

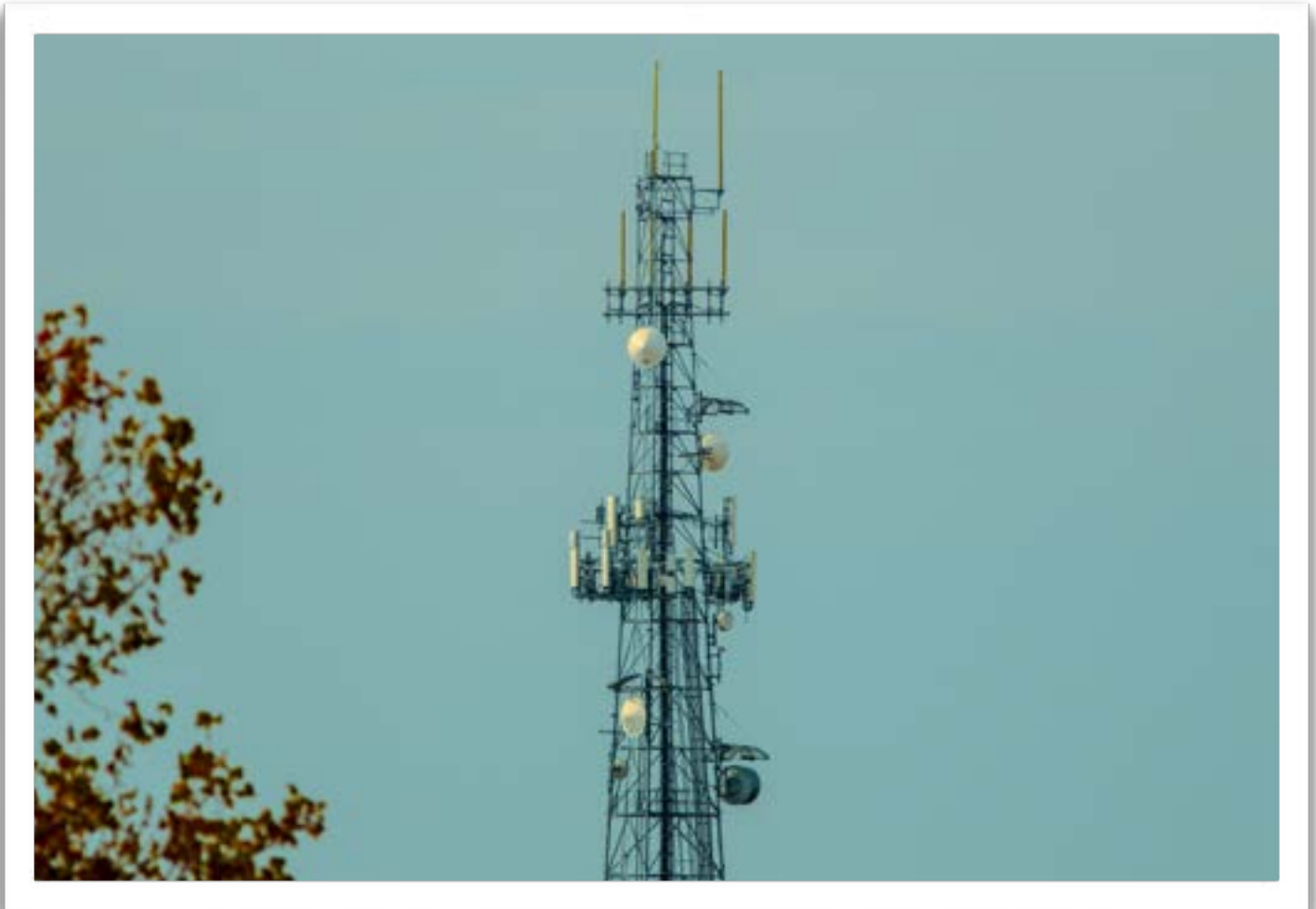
I believe that technology is often a cross upon which common sense and good judgment are crucified. This opening to a presentation I delivered in Italy in 2001 explains why organizations overspent and underachieved so much with Internet technology, and what you don't want to do with wireless. (Wireless, Inc - 2002)

Here we are, 21 years after I wrote my book about wireless technology. Unlicensed fixed wireless access (FWA) has a potentially significant role to play in broadband and BEAD. Unless common sense and good judgment are crucified.

NTIA, against reason, practicality, and common sense, has directed states to prioritize fiber optic networks in BEAD projects, and use unlicensed FWA only in extremely "high-cost per location threshold" areas that have not yet even been determined by the NTIA and the states. Yet, the same NTIA granted seven Pennsylvania counties \$20 million entirely for unlicensed fixed wireless and granted the Apache Tribe of Oklahoma millions for a hybrid fixed wireless/fiber network.

The White House, the NTIA, hundreds of policymakers, state broadband leaders, and advocates say that BEAD is a "once in a lifetime opportunity" to connect every American. "Internet for All" is the battle cry! Given this opportunity, why are they knee-capping (figuratively speaking) our wireless providers and those who would call upon wireless technology?

Doesn't sound like good judgment.



Classic multi-purpose wireless tower, hosting fixed wireless point-to-point and point-to-multipoint access, cellular/mobile connectivity, and other wireless communications services.

“Be All You Can BEAD” presents community stakeholders with an overview of: A) why FWA is stellar technology needed in the BEAD program; B) how we can combine wireless and fiber to be greater than the sum of the parts; and C) BEAD policy driven by common sense and good judgment.

WANT FASTER ROI? ADD WIRELESS.

Using a “wireless leapfrog” deployment tactic, BEAD could generate ROI for communities in 2024. “Because we know the fiber portion of the project is going to take anywhere from two to three years, we are building three cell towers and using point-to-multipoint to connect the Apache Tribe of Oklahoma much sooner,” says Jamaal Smith, Kajeet Vice President of Sales Public Sector and Private Wireless.

The wireless connectivity will leapfrog the fiber ring and 50 miles of fiber, and in months serve residents while generating needed cash flow. Kajeet’s connectivity management platform is connecting over 100 businesses as well as tribal members across their land. NTIA is funding this project as part of the Tribal Broadband Connectivity Program (TBCP). Smith says, “The community needs reliable, fast, and affordable access to the Internet for Telehealth, education, e-commerce, and remote work. This access will deliver innovation and economic development. Also, along with neighboring tribes, they are forming a consortium, building a fiber ring, running wireless to residents, and operating their own WISP.”

Several Arizona communities use this leapfrog tactic, too. Tamara Rosenberg, State Broadband Coordinator at Resound Networks says, “Communities don't know how long it'll take to deploy fiber because of hurdles such as weather, contractors, and politics. With wireless networks it can be only three to four months. A lot of communities are so far behind. We were talking recently about how kids in their freshman year of high school, based on what some [fiber] plans are currently, are never going to get broadband at home before they graduate. Which is a tragedy!”

Derek Underwood, North American Regional Vice President, Cambium Networks, says, “After three or four years when the network’s complete,

communities will grow. But you will have spent the BEAD money and network op-ex costs rise. WISPs can come in quick and extend the fiber with wireless. WISPs, by their nature, contain costs while keeping pace with rapid growth and erratic project schedules. They can do it quicker and their equipment is easier to upgrade.”

STREEETCH YOUR DOLLAR. PUT YOURSELF IN THE WIRELESS PICTURE.

It’s likely that only few states using fiber-only infrastructure can meet all of their broadband needs with their BEAD allocations. State broadband offices already are coming to grips with that reality of telling one group of communities they get grants and another group, “Thanks for playing.” Also, there are dozens of route-changing events that can expand the networks unexpectedly.

This isn’t your father’s - or mother’s - wireless. Use this technology to spread your BEAD dollars more effectively and get better and quicker broadband results. The past 10 years have seen lots of major advancements in wireless. Now the industry supports gigabit capabilities, non-line of sight capabilities; things that hindered previous iterations of equipment are now solved.

“Use [FWA] technology to spread your BEAD dollars more effectively and get better and quicker broadband results”

Here are examples of fixed wireless deployments that are carrying out mission-critical roles for communities. Make your digital dollars do more.

FUTURE-PROOFING WITH FIXED WIRELESS

“NTIA knows that it's fast, that it's reliable, and they believe in it, or they wouldn't have awarded us \$20 million for our [entirely unlicensed FWA project](#) that covers multiple counties in Pennsylvania,” says Dwayne Zimmerman, Founder of Crowsnest Broadband LLC. “We edged out over 215 applicants nationwide to secure an award from the Broadband Infrastructure Program to serve 7,261 unserved households.”

A WIRELESS STEPPING STONE

A 2015 lesson in wireless leapfrogging from Renville and Sibley Counties, MN, might make for a quicker broadband ROI in BEAD. Splitting the project, they built out the fiber ring; simultaneously ran fiber to towers that held fixed wireless equipment that went to homes; and then subsequently built fiber to those homes. 90% of the residents got 25 megabit symmetrical wireless service by the end of the first year, and 70% had fiber by the end of 2016. With FWA, by the first six months they started generating \$50,000-\$100,000 in revenues.

CONQUERING THE DIGITAL DIVIDE WITHIN URBAN COMMUNITIES

A fiber-only policy can hurt African American and other communities of color. “Advocacy group Public Knowledge has always argued that unlicensed spectrum can create minority-owned mesh networks that are fed by a fiber line dropped into a neighborhood,” says Harold Feld, Senior Vice President of Public Knowledge. “It’s significantly less than running fiber to homes and it promotes minority ownership of nonprofits and cooperatives that are more responsive to the communities.

NTIA is funding a mesh network buildout in West Philadelphia that will pilot a holistic approach to urban broadband. Many policymakers assume that all you need is affordable Internet and computers to cure the digital divide in urban America. But a multi-faceted line of attack can work best - i.e., holistically building broadband infrastructure with key partnerships throughout urban communities in addition to favorable pricing and PC's.

Wilco, Inc, a 40-year minority-owned Philadelphia provider of affordable technology services, has teamed with Community College of Philadelphia, PCs for People and Bloc Power, to: 1) enhance broadband infrastructure at multiple sites and deploy wireless to homes; 2) provide 300 laptops and broadband modems; and 3) offer workforce training and digital literacy. Internet of Things (IoT), smart and other technologies will augment the mesh network. "This is a perfect thrust forward for digital equity in those communities perfectly situated within this prime innovation corridor of our City," said Brigitte Daniel Corbin, CEO of Wilco.



Better health outcomes can be achieved by bringing Telehealth options to the patient via wireless connectivity.

CHANGING LIVES FOR THE BETTER

It has been shown that only 7% of men seek helpful imaging and consultation for an enlarged prostate to the point large enough to cause problems. Left untreated, guys could end up dead, buried, and it doesn't matter who wins the next Super Bowl or Game of Thrones. Thanks to wireless connectivity platform from Kajeet, and the CarePath Telehealth device, that

7% has moved to 70% of men in Virginia Beach, VA – that’s 500 patients and counting.

HOT NEW MODEL!

Creativity and fixed wireless bring a new broadband model in Lewis County, WA, uniting urban, rural, business, and residential customers in a way that bodes well for America. Rather than the usual subscription model, Deborah Simpier, CEO of Althea, delivers a pay-as-you-go model, and customers who can’t pay don’t lose their Internet service. The network uses the flexibility of wireless and a “pricing and payments” router protocol to serve no-or-low-income, middle income, and businesses customers together. This sustainable network currently serves around 300, 50% rural and 50% urban subscribers, using a mix of wireless technologies.

RELIABILITY BUILT TO PROTECT LIVES

More emphasis needs to be put on the vital roles WISPs play at keeping the local and county government operating efficiently, which they have been doing for years. Micrologic is a WISP in the densely forested, hilly area of Buckhannon, WV. It’s been providing technology and Internet solutions to homes and businesses for over a decade and is a leading provider of wireless high-speed Internet in the region. Micrologic uses unlicensed spectrum to serve Tucker County, WV (and elsewhere throughout the state), it being so reliable that the county uses it for the community’s 911 service. County officials chose Micrologic because the current infrastructure was too unreliable and it was necessary to have a sturdy backup in case a link went down.

SUCCESS BREEDS SUCCESS – SO RUN WITH IT!

Don't hide your wireless light under a bushel. Fiber enjoys so much favor, recognition, political clout and wears the mantel of "future-proof" because of three years of constant telling their story. For the wireless industry, telling success stories is imperative. Time is short.

Communities are making broadband decisions now. They need to know the power of wireless - ASAP!

"10 million Americans are connected to fixed wireless...Without fixed wireless, some communities wouldn't have any broadband at all."

WISPs should be ambassadors for the technology, the impact it makes, the advances it has made: gigabit capabilities; non-line-of-sight capabilities; approximately 10 million Americans connected to fixed wireless services; massive spending for R & D so communities can continue to future-proof networks. Without fixed wireless, some communities wouldn't have any broadband at all.

Fixed wireless successes are the technology's strongest selling cards. Spread the wealth.

In the high-frequency trading game, mere seconds separates big-time winners from the rest. These traders have been using FWA services for a long time in the 6 GHz band. Todd Harpest, co-founder of a successful WISP in Ohio, relates one trader's thought: "High-frequency trading continues to prefer using fixed wireless to transmit time sensitive, low latency data since it is much quicker sending data as the crow flies rather than utilizing other wireline technologies to complete their last-mile connections."

Don't just tell 'em – show 'em. "I've taken it upon our team to educate Pennsylvania's broadband office about our WISP and about wireless," says

Zimmerman. "Just a few weeks ago we had their Executive Director and Deputy Secretary [of Pennsylvania's Broadband Office] out to visit us. We went around to some customers, we set up an antenna and showed them how it works, and we did some speed tests for them. They're beginning to understand that they don't want to overbuild this fixed wireless stuff because it works great. They saw me do a 400 meg speed test in the middle of nowhere - through trees!"

The rural and urban WISP success story is born of character. When COVID hit, John Gill started Kentucky Fi, in rural Jessamine County, KY. "Before I knew it, I had over 100 customers and covered 55 square miles." Gill tells his customers, "I'm here signing you up. I will be here installing your connection, and if it has a problem I will be there, too. You're not calling a call center; you're calling my wife. Customers see me at Walmart or grocery shopping, and they can come up to me and ask questions."

The WISP story is also born of creativity. Matt Larsen is the owner of 20-year-old Vistabeam. They created a concept called Community Empowerment Centers to develop a closer bond with the communities that they serve.

"Incumbents have 'technicians' in their offices, but they mostly focus on selling. Center



From Left - Matt Larsen, FCC Commissioner Brendan Carr, and Vistabeam's crew doing a fixed wireless site survey, Casper, WY.

employees train to be digital navigators, help people enroll in the FCC's Affordable Connect Program (ACP), and facilitate Telehealth by connecting with medical professionals. Workstations enable residents to complete forms



FFA "Thank You" notes to community WISP, TekWav, of Sherman, TX, for supporting local area students raise their livestock and learn agribusiness.

for government programs or have general Internet access until they get comfortable having computers in their homes."

WISPs and other local providers are not just digital resources, they are people invested in the communities they serve. They are neighbors, problem solvers, and creators.

Yet, NTIA has given larger fiber optic broadband companies carte blanche to displace these small local providers already offering services, while simultaneously refusing to give them a seat at the table. As the young folks say, WTH?

DO THE RIGHT THING!

It seems we need to insist policymakers put its BEAD policy where its heart is. If you tell the American public that BEAD's mission is to ensure "Internet for All," yet you endlessly diss FWA with policies stated, implied, or inferred, your heart's not right. BEAD should be a call for "All hands on deck!"

As David Zumwalt stated in a letter to Alan Davidson, Assistant Secretary of



So close yet so far away - even where infrastructure is available, many rural farms and areas sit in islands of poor connectivity, neglected or significantly underserved by legacy providers. FWA providers fill that gap for millions of American broadband consumers.

NTIA, "WISPs are reliable service operators and broadband operators, and the technologies that they use are proven reliable. They're in use today in critical applications, in law enforcement, medicine, government and private enterprise and of course in residential environments. WISPs can get it done." Not the only way, but one of several ways.

There are a truckload of tools, technologies, and diversity of business models that can be brought to bear in various combinations to meet digital needs. We do an enormous disservice to our communities by ruling out any combinations. Most people believe in whatever technology gets the job done as long as it is affordable, reliable, and meets the NEEDS OF THE COMMUNITY.

"For those who believe that fiber is the only way to go, there are challenges with supply chain, there are challenges with experience," says Zumwalt. "It will not be instantaneous to close the digital divide if we insist on a strategy

that uses one technology. This is not an opposition to fiber, but we do point out – again – that if our primary task is to close the digital divide, then what we're looking for NTIA and other leaders in government to do is to focus on that task. How do we do it quickly, with reliable operators, with reliable technologies?”



Water tower serves dual role, providing not only water services but vertical access for reliable, fixed wireless broadband services in ex-urban Manassas, VA.

Josh Luthman, Owner of Imagine Networks LLC, concurs. “To get true resiliency you need diversity in a geographic sense, an operational sense, and diverse media. I want one really good wireless connection and one really good fiber link. Should a lightning storm knock out the tower, I still have fiber. If a backhoe hits the fiber, I still have wireless. Wireless is a great tool. Fiber is a great tool. Use them both wisely.”

And for the love of all things digital, be consistent with how NTIA implements the Tribal TBCP. They awarded \$87 million in 12 TBCP grants to broadband networks using entirely unlicensed spectrum, some of which were described as providing “reliable” broadband service. “WISPA agrees with NTIA that those networks should be considered reliable broadband service,” says Louis Peraertz, Vice President of Policy. “If those networks are considered ‘reliable’ for the purposes of TBCP grants, then they should be ‘reliable’ enough for the purposes of the BEAD program.”

CONCLUSION

The issue here is not “fiber vs. wireless.” That premise is patently silly, driven in large part by marketing people and demanding stockholders! But it’s what the customer (that is, the community) needs which determines the type of technology. And here we have a problem. The NTIA doesn’t believe fixed wireless using entirely unlicensed spectrum can provide “reliable” broadband service.



However, as we have seen in this paper, many people don’t agree. Millions of WISP customers use fixed wireless networks operated over solely unlicensed spectrum. A few dozen multi-million-dollar broadband awards have been given to communities for

fixed wireless entirely using unlicensed spectrum, with at least a dozen of those awards from the NTIA itself. Several communities have seen the value in wireless leapfrogging deployments.

Of course, there’s something to be said for having wireless broadband while waiting three years for fiber. Fiber-only is losing its luster as states are

starting to push back against the NTIA's fiber priority because their BEAD allocations can't connect all if we are locked to this regulatory framework. Idaho, Maine, Louisiana and others are among those wanting to give their constituents every option. Some communities do analysis and determine that the only way physically to reach people in remote, hard-to-serve areas is with wireless.

"We've gotten into this 'fiber versus wireless' discussion, and I believe the discussion should be more about hybrid fiber/wireless networks," says Underwood. "At Cambium, we're a wireless manufacturer first. But we also have a fiber solution because we believe that our service providers need to have that option because in some places fiber makes a heck of a lot of sense."

- Recommendations for NTIA**
- **Change definition of "reliable broadband" to include all wireless**
 - **Remove fiber priority**
 - **Allow communities to choose the right tool for the right job to bridge their digital divides**

But a one-size-fits all approach alone will not work.

Americans appreciate greatly what NTIA has done and what the agency continues to do. With this latest broadband initiative, BEAD, NTIA has moved mountains in these last two years. As Zimmerman states, "BEAD stands a better success deploying broadband than previous grant programs, in large part because BEAD action plans are being administered at the state level."

But questions remain. 1. Will NTIA change the definition of "reliable broadband service" to include licensed and unlicensed? 2. Will NTIA remove the fiber priority for sub-grantees, letting the states chose what they believe is best for the job at hand? And 3. Will NTIA state that communities are

encouraged to use technologies that they find works at closing the digital divide?

Let's not blow this once-in-a-lifetime effort to bring Internet to all!

About the author: Craig Settles wrote about and worked for Ricochet in 1998, the first wireless Internet access service in the U.S – before Wi-Fi, 3G, and other pioneering technologies. Founded in 1985, Metricom's Ricochet freed executives and workers to take the Internet on the road. This experience led Settles to write *"Wireless, Inc. in 2002,"* and then several books about community broadband, including *"Fighting The Good Fight For Municipal Wireless,"* in 2005. Currently, Settles unites community broadband teams and healthcare stakeholders through Telehealth projects which transform healthcare delivery. Settles can be reached at craig@cjspeaks.com; www.cjspeaks.com. WISPA sponsored *"Be All You Can BEAD."*

