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November 5, 2019

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
455 12th Street SW
Washington, D.C. 20554

Re: *Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz, GN Docket No. 18-122*

Dear Ms. Dortch:

Midco believes that any portion of the 3.7-4.2 GHz spectrum band (C-Band) that can be cleared should be reallocated for terrestrial uses, including fixed wireless. We continue to be concerned,¹ however, that this valuable spectrum may not be made available to serve rural America and close the Digital Divide with high-speed fixed wireless technology.

Midco has provided wired broadband access in rural America, including South Dakota, North Dakota, and Minnesota, for over 20 years, and we know that fixed wireless can help close the Digital Divide where fiber is not economically feasible.² From our experience, we also know the impact that mid-band spectrum can have in providing service to customers. That is why we

¹ In February of 2019, Midco filed a letter in this docket opposing a private auction as then proposed by the C-Band Alliance. *See* Letter from Nicole Tupman, Midco, Marlene H. Dortch, Secretary, FCC, GN Docket No. 18-122 (Feb. 25, 2019). In that letter, Midco provided its notice of interest to compete for any new terrestrial C-Band licenses.

² Midco Reply Comments, In the Matter of Rural Digital Opportunity Fund & Connect America Fund, WC Docket Nos. 19-126 and 10-90 at p. 1-2 (Oct. 21, 2019) (“Midco has served the Midwest for over 85 years and has been a wired internet services provider for over 20 years. With almost 10,000 miles of fiber, largely in the rural areas of Minnesota, North Dakota, and South Dakota, Midco understands the difficulties associated with serving rural areas. Midco knows that rural economies need broadband access, or they will eventually be ‘crippled.’ Midco also knows, from over 20 years’ experience in providing broadband access, that fixed wireless is a ‘proven and economically feasible solution’ to providing broadband to rural America.” (quotations omitted)).

applied for a C-Band experimental license, which the Commission granted.³ We wanted to know, first hand, whether we could use the C-Band for fixed wireless service.

Midco tested a single Telrad, E-NodeB capable of running in the lower 100 MHz of the C-Band (3700MHz-3800MHz). Midco installed the E-NodeB on our tower outside of Mitchell, SD at 200 feet and pointed the radio to the Northeast. We programmed the E-NodeB to run at the same power levels as those we use in the 3.5 GHz, Citizens Broadband Radio Service (CBRS) band. The propagation for this single sector covered approximately 38 square miles, as shown in Figure 1. The green areas in Figure 1 estimate the coverage area, while the red shows areas that are likely not covered from the single sector without additional, on-site engineering. Midco drove out the propagation area to confirm that the green area is serviceable and could achieve speeds of at least 100/20 Mbps. We used a Telrad, Category 6 Customer Premise Equipment radio (CPE), which ran customized firmware to “unlock” the C-band channels.

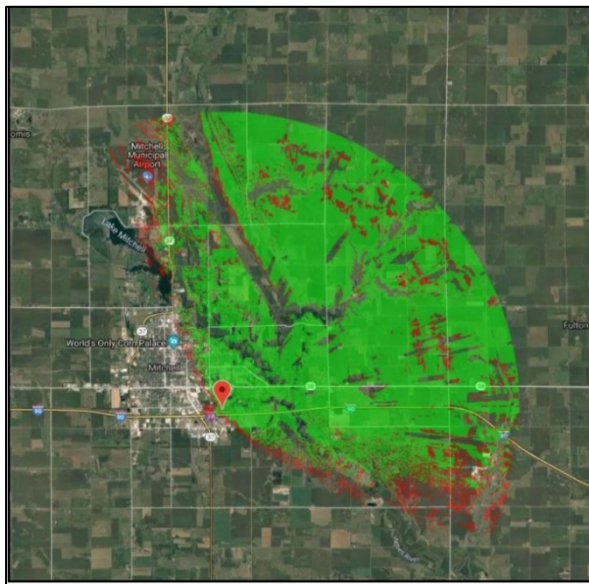


Figure 1: Propagation from Mitchell, SD on a Single E-NodeB

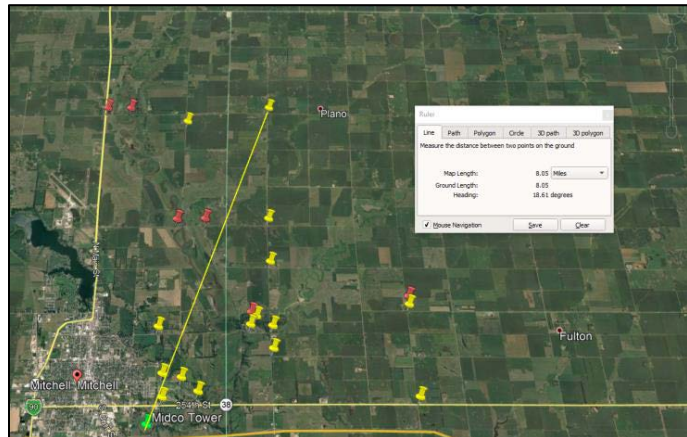


Figure 2: Sample Testing Locations from Mitchell, SD Tower

Midco tested the connection between the tower and the CPE at a conservative testing height of 6 feet, with the same power levels as used in the CBRS band. Figure 2 shows some of the testing locations completed by Midco. Successful locations are those represented by yellow pins, meaning no other engineering was needed to get broadband access at that location. Unsuccessful testing locations are those with red pins. The red pins indicate that, at a deployment height of 6 feet, additional engineering would be required

to service that location. These C-Band test results are consistent with those in the CBRS band in Figure 3, which Midco has previously shared with the Commission.

³ Midco C-Band experimental license, Call No. WJ2XWL.

The testing confirms that C Band spectrum operates much like the CBRS band. We can use the same general engineering metrics that we use in the CBRS band, meaning that we could generally use a 7-mile radius for coverage per sector.

Moreover, an advanced LTE fixed wireless system, like that used by Midco, is upgradeable—meaning that fixed 5G will soon be possible for rural America. In fact, Midco is currently testing Category 12 and above CPEs that are capable of speeds nearing 200/40 Mbps, and could be programmed to provide these speeds using

C-Band spectrum. Near-future technological advances include carrier aggregation on the tower base station between the CBRS or C-Band and the 5 GHz bands, allowing for even faster speeds and/or larger coverage areas from a single sector. Other advances will also include carrier aggregation on the uplink from the CPE to the tower, allowing for faster upload speeds and/or more customers to be added to a single sector.

All of these technological advances, as shown in real world testing, confirm that fixed 5G is coming to rural America and can provide ever-faster speeds and options for rural Americans. But this technology needs more spectrum to perform the carrier aggregation functions required for a fixed 5G technology. The C-Band is key spectrum for Midco to use in providing fixed 5G service to our most rural, remote customers.

We support WISPA’s position that the C-Band can be used as shared spectrum, as confirmed in the study conducted by Professor Reed at Virginia Tech:⁴

This report, which relies on conservative estimates and standards-based assumptions, shows that earth stations can be coordinated and protected within a geographic exclusion zone of less than 10 km. In turn, this means that more than 80 million Americans and 78% of the geographic area of the country will have the ability to access currently fallow spectrum for P2MP services. The greatest availability will be in rural areas where earth stations are less prevalent and widely dispersed.⁵

Midco generally agrees with the Reed Study that shared access is possible. We agree with the Reed Study not only as a fixed wireless operator, but also as a cable operator with numerous

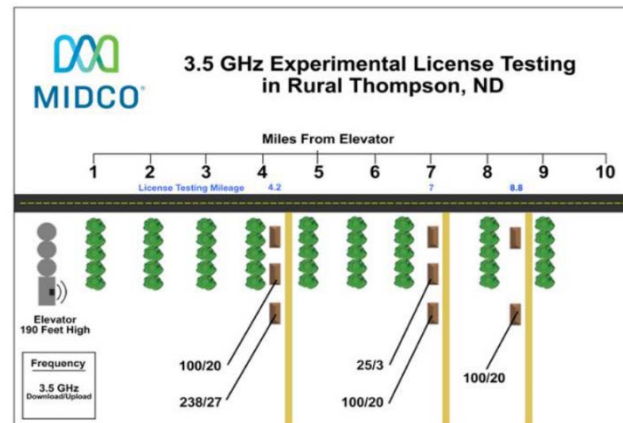


Figure 1: CBRS Testing Summary in Thompson, ND

⁴ See Letter from WISPA, Microsoft and Google, to Marlene H. Dortch, FCC Secretary, GN Docket 18-122 (July 15, 2019).

⁵ *Id.* at 1-2.

earth stations. While shared use would best accommodate the needs of all users, some assistance may be necessary in repacking and compensating existing providers.⁶

Alternatively, if the Commission decides to auction any freed spectrum, we believe that the Commission should conduct the auction to provide the protections and procedures as required by law.⁷ A Commission-led auction is especially needed when, as with the C-Band, there are multiple applicants with various technologies interested in the spectrum.⁸

Midco is especially concerned about a private auction given that too much of the discussion around the C-Band focuses on small cell, mobile 5G. Small cell technology requires a network of vertical assets every few hundred or thousand feet. Our fixed wireless network can serve remote areas where a home or two might currently exist every square mile, and where rural flight will continue to shift our sparse population. An infrastructure-heavy small cell deployment will not serve our most rural areas, outside of an event center or populated downtown center.

For example, the downtown area of Sioux Falls, SD, with a population of over 180,000, has a small cell deployment to prepare for mobile 5G.⁹ To the south of Sioux Falls, however, are numerous small towns in need of service, such as the Beresford, SD area with a population of just over 1,900 people. While there is a need to serve the rural areas of Beresford with broadband, there have been no public announcements by small cell providers to serve these individuals. Midco, however, is currently constructing a next generation, LTE fixed wireless deployment in the rural areas of Southeast, SD, including Beresford, to close the Digital Divide. Access to C-Band spectrum would enable us to offer even faster speeds and serve more customers in need of broadband access with fixed 5G-capable technology.

As the Commission knows, there have been thousands of pages of comments filed in this docket, and many proposals from which the Commission could create rules to use the C-Band more

⁶ See, e.g., Letter from Charter, ACA Connects and CCA to Marlene H. Dortch, FCC Secretary, GN Docket 18-122 at p. 2, bullet 7 (July 15, 2019).

⁷ “In 1993, Congress authorized the FCC to use auctions to allocate spectrum licenses. . . Congress directed the FCC to design auction procedures that would serve a number of policy objectives. Those objectives include promoting efficient, intensive, and innovative use of the electromagnetic spectrum without excessive concentration of licenses, while advancing economic opportunity and competition by disseminating licenses among a wide variety of applicants.” *SNR Wireless Licenseco, LLC v. FCC*, 868 F.3d 1021, 1026 (D.C. Cir. 2017); see generally 47 U.S.C. § 309(j)(1) (“the Commission *shall* grant the license or permit to a qualified applicant through a system of competitive bidding that meets the requirements of this subsection.” (emphasis added)).

⁸ *SNR Wireless*, 868 F.3d at 1026; *Fresno Mobile Radio, Inc. v. FCC*, 165 F.3d 965, 971 (D.C. Cir. 1999) (“§ 309(j)(3)(B) requires the agency to consider a variety of objectives[.]”).

⁹ Argus Leader, Verizon: 5G Will Be Live in Sioux Falls by Year’s End (Oct. 31, 2019) <https://www.argusleader.com/story/news/city/2019/10/31/verizon-5-g-live-sioux-falls-years-end-fast-internet-fifth-generation-internet/4111957002/>.

efficiently. In crafting these rules, Midco requests that the Commission consider the needs of rural Americans and the reality that current fixed wireless and the near-future fixed 5G technology could close the Digital Divide if providers have access to more spectrum. To that end, Midco urges the Commission to adopt the proposal from WISPA, with appropriate safeguards and assistance for current earth station operators.

Sincerely,

/s/ Nicole Tupman

Nicole Tupman
Assistant General Counsel