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Federal Communications Commission
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Comments on ET Docket 02-380 and WT Docket 02-381

Chase 3000 is a fixed wireless Internet service provider serving Nebraska and Colorado. We have over five hundred wireless broadband customers. We are the only way the majority of these people can obtain broadband service. Cable and DSL are not options for those that live outside of the town limits, and they were not options for those inside town limits until after we were offered wireless service. In other words, our presence caused previously stagnant entities to also start offering high-speed Internet.

We use the unlicensed 2.4 GHz frequencies. We cover three flat, dry, nearly treeless counties. We have approximately 2400 homes in the area. There are approximately 2700 square miles in the three counties. At the current time, there are three fixed wireless providers -- two using DSSS and one using Frequency Hopping. There are two telephone companies. One offers cable modems. The other uses DSL.

Chase 3000 provides service to about 90% of the region. The areas where we cannot get service to are the homes that have a large number of trees surrounding them and the very remote homes that are in small valleys. The only way to get broadband to these people is via satellite or by putting a repeater near them. A repeater would cost us about \$1500, assuming there is power at a suitable high point nearby.

The cost of equipment for fixed wireless has dropped dramatically over the last several years. Cost is no longer an impossible hurdle. It is possible to install an access point for as little as \$5,000 -- though \$20,000 will allow it to be done well.

The client end can cost as little as \$300 plus labor, if one uses DSSS. Frequency Hopping will cost twice that. We can typically provide service to those 10 miles away from the access point. Our longest stable connection, at legal power, is 13 miles.

We have been providing broadband via fixed wireless since 1999. We have deployed equipment in communities where other providers exist and where they have attempted to interfere with our network. We have found the unlicensed radios and equipment to be very versatile and a great solution for those living in areas where there are no other choices.

Our biggest problem today is engineering a system that will allow a large number of radios to be in close proximity with limited spectrum while working at very low power and still reaching both the people close to the access point and those who live miles away.

The second challenge we have is the time it takes to do an installation. Increased power for the radios would allow for much faster deployment.

If one wants to see more broadband in rural areas and speed deployment, then the following things would be very helpful:

- Sufficient spectrum to allow multiple radios to co-exist while transceiving large amounts of data.
- The power level should be dependent on the environment. Allow higher power levels for sparsely populated areas and areas with a large amount of natural interference, such as forests. In urban areas, the power level should be lowered to accommodate more radios with less interference. People per square mile or trees per square mile might be a fair way to determine allowances for higher power.
- Unlicensed spectrum that is restricted in use to those who are certified. Since the radios needed are point-to-multi-point, it is easy for a radio to create havoc (if it isn't set up properly). Restrict use of this frequency to those that who have passed a certification test, similar to a HAM operator's certification test. It should be non-discriminatory, but it should also cause the user to demonstrate some level of competence. The idea is not to restrict who can operate radios. It is to make sure that those who do operate them understand the basics, in order to minimize chaos.
- Create a certification process that allows certified integrators to combine various antennas, amplifiers, radios and cables from various vendors to create a composite system, as long as it does not exceed certain limits.
- Allow anyone to operate a radio, as long as they have certification and are actually using the spectrum. No one should be allowed to frequency squat. No one should be allowed to put up a radio for the sole purpose of

claiming territory. Whoever can demonstrate that the spectrum is actually being used should be allowed to operate a radio.

- Empower a non-biased arbitrator who has the authority to resolve disputes between certified operators. It is important that this arbitration be fast (less than a month) and fair. The arbitrator should give deference to those with equipment in place first, as long as the equipment is being productively used (with a liberal definition of productive). The arbitrator should have the authority to cause an existing operator to modify radio frequencies or patterns (as long as it can be done without great expense) to accommodate another radio operator. First to use, first to “own.”
- Provide a forum for public input on operators abusing the spectrum and for provisions to revoke certification for gross abuse.
- Hold no bias toward any type of protocol or frequency modulation. Today, DSSS, Frequency Hopping, and OFDM exist. In the future other types of modulation and other protocols may exist. Make sure the regulations created allow for these new developments to exist.

In an ideal world, you would set aside the following groups of unlicensed spectrum:

- Unlicensed with minimal regulation, as you have with 900 MHz, 2.4 GHz and 5.x GHz. This policy has proven to be conducive to innovation. We appreciate that.
- Spectrum specifically allocated for point-to-multipoint radio systems meant to deliver broadband to homes and businesses. This should be unlicensed but should also require the operator to be certified. There should be two general frequency ranges allowed for this type of service. It should be something under the 1 GHz frequency to allow for the penetration of trees with sufficient spectrum to allow broadband. Also, it should be something under 6 GHz to allow higher throughput in areas where trees are not a factor.
- Unlicensed spectrum specifically for point-to-point communication. This spectrum should be suitable for anyone needing to make a high bandwidth point-to-point connection. It should be subject to being overseen by an arbitrator in order to resolve any conflicts.