Midcoast Internet Solutions
25 Oak Street
Rockland ME 04841
207-594-8277

Please accept these comments regarding Docket Number 02-135.

My company, Midcoast Internet Solutions is one of perhaps thousands of small companies providing broadband internet access with wireless technology. Consider the broadband deployment troubles the RBOCs and their competitors face and the failures of the DSL companies, and the repeated troubles of the cable industry such as the loss of @home, and the trouble Adelphia is having. The only remaining certainty for competition in broadband is the use of wireless technology.

The cable companies own and protect their outdoor plant and do not share it with other broadband competitors. The phone companies have had mixed results and slow success with sharing their lines for broadband delivery, and it's plainly evident they would rather not be doing that. Around 1997 or 1998, ISPs such as ours have begun to use wireless internet technology based on the 2.4ghz, 5.8ghz, and 900MHZ ISM band to provide broadband. In most areas, we are the only broadband provider. In the other areas, we are the only competition to the cable company's or the phone company's broadband offering.

If high speed internet is to be an important part of our nation's future, wireless spectrum policies should support this. The companies making this happen are not the cell phone companies or the RBOCs. The companies providing broadband internet to places where there is little or none are small companies using unlicensed frequency who are quick to adapt and are not tied to older technologies. They also have, for the most part not been around long enough to purchase useful spectrum in an auction, nor would they have been able to afford it. Thanks for this opportunity and now I will answer some of the questions as they pertain to my business.

1. What specific policy and rule changes are needed to migrate from current spectrum allocations to more market-oriented allocations?

Wireless internet services are provided primarily on ISM band frequencies, most commonly 2.4ghz and 5.8ghz. There are also a smaller number of providers using MMDS 2.5ghz frequencies. Most of the MMDS frequencies in my area are underutilized or not used at all, and the license holders are not known for the ability to provide broadband services, nor are they internet experts. ISM permits smart businesspeople in small companies to build a network quickly and inexpensively, and the savings are generally passed on to the consumers. These ISM bands are getting full in urban areas and many internet service providers (ISPs) have yet to deploy wireless internet solutions. Additional unlicensed spectrum solely for outdoor delivery of broadband would be very handy. Rural areas in particular would benefit from lower frequency spectrum which can penetrate wet foliage. This would leave the ISM bands still available for private computer networks, portable phones, and all the other uses of ISM bands.

2. Should current, restrictive service and operating rules applicable in many bands be changed to provide licensees with greater flexibility? If so, in which bands and how?
a. Should incumbent users be given flexibility within their existing spectrum?

My businesses' experience is with the ISM band and my equipment operates by part-15 rules. One method which would enhance flexibility and decrease costs for consumers would be changing how equipment is certified. Right now, a whole system is certified (antenna, cabling, and radio unit) to meet certain power output limits. This does not permit law abiding users the ability to shop around for antennas and cable in a competitive market, and also limits our choices regarding cable length. If each component were certified in regards to its gain and interference potential, it could create a bigger and more competitive market for wireless internet hardware, reducing the subscriber's setup costs greatly, and reducing the providers' infrastructure costs as well. Of course, the professional installer would be required to use a combination of certified components tht did not exceed permitted power levels. This is not difficult to calculate, and many of us wish for this to be applicable to our use of existing part-15 ISM equipment.

d. What are the relative efficiencies and inefficiencies of different licensing models?

I believe auctions for geographic areas are functional for some tasks, (such as regional cellphone networks) but unsuitable for other uses. The many companies like mine who service a small geographic area and serve it well don't have the financial backing to bid in auctions nor do we want to be outbid by competitors who already have means of providing broadband internet services through their affiliate companies. E.g. if Verizon bought the spectrum most useful to us, they would be preventing competition in broadband as they are already able to provide it with DSL and perhaps other means. Having to get spectrum via an auction also requires us to have the spectrum before we choose equipment, thus causing the auction winner to have to not use spectrum until equipment is available or most cost effective. If a chuck of spectrum were available for wireless broadband providers such as my company to share, there would be many companies needing equipment and markets and systems for building that equipment would be quicker and stronger.

3c. How can spectrum use, congestion and demand be accurately measured and predicted?

If special spectrum were available for outdoor broadband networks, and it were available without auctions, it could be charged at a small per-radio rate. Perhaps if the FCC were to get $10 and the zip code for each radio installed, it would be able to determine utilization for geographic areas. If this sounds like a good idea, keep the fee small. It would be a cost borne by customers to have broadband internet access, which is something our nation is interested in promoting, not holding back. A flat fee is fair and scalable for businesses both large and small providing broadband services. The spectrum is also technically able to be shared between a number of providers in a given area. We already share spectrum in the ISM band. ISPs providing wireless broadband services tend to use spread spectrum radios. Some are frequency hopping, and some direct sequence. Frequency hopping is most efficient and able to co-exist with other hopping radios with little interference trouble. Other ISPs use direct sequence due to its low cost and ubiquity. It does not use spectrum as efficiently, but is still popular. They may still use this in the ISM band if new spectrum is made available, I would prefer a method like frequency hopping which is both flexible in avoiding interference from competitors

and colocated radios and efficient in its use of spectrum.

5. Should more spectrum be set aside for operating unlicensed devices? Should the kinds of permissible unlicensed operations be expanded? What changes, if any, should be made to the rules to accomplish this? Because of the commons aspects of unlicensed use, is there concern that, as congestion rises, spectrum may not be put to its highest valued use? If so, what policies might be considered to anticipate this problem?

Many of my suggestions above relate directly to this question. More flexible certification rules for outdoor broadband networks, promoting spectrally efficient radios, and additional frequency would be useful for this. Lower frequency for rural areas would be helpful in penetrating tree cover, and high line-of-sight frequencies would be fine in the cities. However too small a wavelength such as those affected by fog and rain would be unsuitable for many parts of the country.

21. How, if at all, can the Commission provide incentives for operators to use spectrum efficiently? For example, how could to the implementation of fees (e.g., on the basis of Hz per square mile per minute or Hz per population coverage) or receiver standards affect spectrum efficiencies?

As I briefly suggested a fee-per radio for use of a band specifically for outdoor wireless broadband services, perhaps the fee could vary based on how many bits per megahertz a spread spectrum radio can receive and transmit. A more efficient radio would be able to move more data using less frequency and could be subject to a smaller fee.

Also in rural areas, operators also have to have a larger coverage radius around their transmitter in order to get the quantity of customers to support their operations. In other areas, smaller cells are better because frequencies can be reused if they are implemented in such a way that the signal does not travel far. We use both methods depending on the geography and quantity of customers. However, many communities are difficult to work with regarding placement of our antennas. Our gear is much smaller, puts our much less power then cell phone transmission sites, and uses a much smaller tower, which the FCC discourages towns from banning. Perhaps additional rules directed at communities to encourage wireless broadband systems along these lines would help us keep cell sizes small. Smaller cell sizes permit lower power operation, smaller antennas at customer sites, and permits more customers in a geographic area the ability to use our broadband services.

Thank you for the opportunity to provide these comments. I hope the FCC can make this spectrum review be useful in determining better ways for providing broadband to the citizens, businesses, and municipalities of the US.

Jason Philbrook
Midcoast Internet Solutions