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WISPA Comments on TV Whitespaces Further Notice  
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WISPA is the Broadband Wireless industry's only industry owned and controlled trade association. WISPA's membership is made up primarily of Wireless Internet Service Providers but also includes various manufacturers, pundits and other interested parties. Our purpose is to work with regulators, legislators and industry leaders to foster continued growth in our industry.

We wish to thank the Commission for its continued work on the whitespaces issue. We believe that the success of the WISP industry (at least 3000 strong with well over 1 million subscribers) is proof positive of the viability and necessity of the unlicensed spectrum model. Many WISPs today are reporting growth rates of 50 to 100%, or more, per year over the last couple of years. These growth rates are often accelerating and are being slowed down by three main causes.

- Cashflow - growth is outpacing working capital.
- Lack of an experienced labor pool.
- Spectrum shortfalls.

In two of these cases, the Commission can be of little, if any help. In the case of spectrum congestion you can help.

The unlicensed model has been so successful in vast numbers of markets that we now have trouble collocating enough hardware to adequately meet demands. Unfortunately the new 5.4 GHz band is not available to us just yet. And when it is, its power level restrictions will relegate it to cell sizes less than 5 miles in radius in all but the most extreme cases. We are not saying that this spectrum is of no value; clearly it will be, however, the applications for the band are limited to short range, high density or backhaul situations.

Unlicensed broadband devices have been deployed far more aggressively and successfully than their licensed counterparts. This is likely

due either speculation on the part of license purchasers, or those that did buy licenses now have insufficient funds with which to deploy. Until the existing licenses are more completely utilized, all new spectrum allocations should be unlicensed. The WISPs' track record of providing services to the consumer is well established now. If you want the public interests served, grant unlicensed. If you want to maintain the cable/DSL duopoly, auction spectrum.

We also believe that the Commission should exercise a very light regulatory hand in any new spectrum allocations, similar in some respects to what's been done so successfully with Part 15. We do, however, wish to point out that these devices are now becoming critical infrastructure for operators, customers, consumers, public safety etc. While we believe that much of the success and rapid advancement of wireless technology is due in large part to the ease of certification of new devices, too much of a "better mouse trap" in too short of a time frame becomes a disincentive to deployment of large robust networks. We believe that there should be SOME level of compatibility and coexistence requirements built into the rules, for example, minimum and maximum channel sizes. Devices should only transmit when they have something to say, not constantly. While our industry thrives on innovation, at some point we also have to maintain positive cashflow in order to be able to fund growth, both vertically and horizontally. We wish to avoid situations where new, standards-based solutions have to share the airwaves with the older, incompatible proprietary technologies. All of one or the other technology in any single band would likely be better from a business case point of view. We would encourage the Commission to create rules that promote fair and efficient sharing of the spectrum and efficiency of spectrum utilization. No more spectrum hogs!

WISPA is opposed to any use of the Whitespaces for personal portable devices at this time. While we firmly believe that a distributed sensing model would be more than capable of protecting the broadcasters, we do NOT wish to see a spectrum issue similar to the current 2.4 GHz WiFi band. In the 2.4 GHz band channel 6 has become all but useless for large-scale, wide area deployments. Almost all consumer grade WLAN gear defaults (fortunately) to channel 6. Because a very high percentage of our customers are also running WLANs (40 to 50% and climbing fast) our client devices normally pick up the local network(s) at 10 to 20 dB above our outdoor based systems. Due to this, most WISPs have had to abandon the middle 1/3<sup>rd</sup> of the band! 22 MHz of spectrum gone, buried under it's own massive success. We do not wish to see this situation played out in any new bands.

Also, we believe that it is NOT in the consumers' best interests to have personal portable devices with propagation properties that would naturally allow them to pass through interior walls but also exterior ones. We believe

that personal portable devices, especially in urban and suburban, markets would be best left to the higher frequency bands. The likelihood of massive amounts of interference are far more likely, on an indoor basis, with bands that carry greater distances through construction and foliage. We believe that this issue should be revisited when technology changes allow for much greater frequency reuse or in the event that outdoor only Whitespaces were greatly underutilized over time.

We do, however, believe that the propagation characteristics of the whitespaces bands will naturally lead very nicely to improved connectivity to mobile devices. Specifically we're thinking of vehicle mounted devices. We believe that it would be against the public interest to rule out any possibility of public access mobile networks. We see the natural public safety applications of the whitespaces bands. Sharing a network with both public safety and the private sector would greatly reduce the costs of deployment for public safety. We do admit that allowing vehicle mounted mobile devices but not personal portable devices may seem contradictory. We counter that by saying that the vehicle mounted units will likely be more intelligent, will be far less likely to be in close proximity to licensed users of the band and will not likely be produced in as great a volume.

We believe that geolocation ideas are not appropriate for any unlicensed bands. Especially low power ones. Drawing circles on a map will not take into account any local vegetation, construction or terrain issues. A distributed sensing model would be far superior, especially over time as the number of sensors in any given area increase. By using the transmit antenna as the sensing antenna, any interference issues should be readily dealt with before they are even noticed by the incumbent. A sensing model will also be able to adjust it's self in real time, making better use of open or congested spectrum.

We also believe that any database mechanisms are unnecessary and a practical impossibility. The WISP market is far too dynamic for a data base of APs and/or customer sites to ever be current and accurate. There is also the very real concern of many in the industry that such data could easily be exploited by competitors for planning of competing systems. And trying to keep up with a database of protected TV boundaries, especially in urban markets for large operators would require far too many man hours. Besides, dumb radios should not be allowed in this space. The devices should deal with interference issues in real time, on the fly.

It has been stated by some, that keeping the antenna height tens of feet off the ground will help keep the unlicensed signals from potentially desensing any local TV sets. We beg to differ on this point as well. The rule as suggested would set a minimum distance from the ground, NOT from any

area TV sets. What happens when setting up a system on a two story house? Or an apartment building?

There should be NO requirement for minimum antenna heights or outdoor only antenna placement. Only a fixed antenna location requirement. Operators in the band need to have the flexibility to design our installations to fit our networking requirements as well as our customer's aesthetic requirements. We believe that the large number of CPE (customer premises equipment) likely to be in place in the average deployment will compensate for the system sensitivity goals of the IEEE and the broadcasters.

It is also our estimation that the antenna height requirement mentioned by the IEEE 802.18 working group will add 20 to 50% to the overall costs of the average installation. We have also seen a trend in which people are more sensitive to anything that interferes with the look of the roofline of the average home. People, and home owner associations are working harder to create clean lines on homes wherever possible. The 10 meter (33') minimum antenna height requirement will artificially drive customers away from any technology used in this band due to costs and aesthetics.

So far, we've not seen sufficient discussion about the greater public good in this proceeding. We wish to raise that issue at this time. At this time, we've seen estimates that 15% of the TV viewers are using over the air reception. We believe the number is probably much lower than that, but as we do not have hard data to dispute it we'll use those numbers. The fact remains that almost all households in this country can get their TV service from cable or Satellite. TV translator systems are shutting down in ever increasing numbers, especially in rural areas. People want more than a couple of channels so they buy a dish. Yet, we're told that large percentages of American soil isn't covered by any broadband options. We're told that rural (and many not so rural) citizens have no or very limited broadband options. We're told that people's video demands are going to be (not might be) delivered at their convenience over broadband connections in just a few short years. Yet, we lack the spectrum volumes and propagation properties needed to service those very customer bases. WISPA believes that, moving forward, broadband connectivity will be more important to the average American than over the air TV reception and the Commission should pass rules enabling it. The Commission must decide if it's more important for someone on the edge of TV coverage to get their broadcast TV or for 20 people to get their broadband. It's also said that wireless accounts for 3% of the total broadband market. The wireless broadband stats we know to be vastly underestimated. Only 400 of the conservative but widely accepted number of 3000 WISPs filed on the FCC's Form 477. The real number of wisps is at least double that number. A 2006 PEW report listed the number of wireless

broadband subscribers as 6 million with an 8% market share. Broadband wireless market share is growing very quickly.

We think the Commission should also consider allowing whitespaces devices to follow the high power 2.4 GHz band rules . At least in extremely rural settings. At distances clearly beyond the range of broadcast TV's usefulness it's likely even more important for the WISP operator to maximize his investment by gaining the most possible customers per cell site that he can. Power levels above 4 watts will be needed for really long distances and/or reasonable penetration in heavily forested areas. We believe that this should be relatively easy to accomplish because the broadcaster's protected zones are already established. Such rules could be suspended inside said areas on any channels on or near broadcast spectrum. The operator could then make a choice of having higher power levels or more spectrum to use.

The FCC's Spectrum Policy Task Force has promoted the concept that receiver standards should be created. Specifically, ET 03-65 addressed this issue almost exactly 4 years ago. To our best knowledge no such steps have been taken. Now would seem to be a wise time to create a receiver standard. Certainly any adjacent channel interference issues would be much easier to deal with if BOTH the transmitter and receiver were working on the problem. Thus far the FCC has only set transmitter standards, this would be the perfect time to start adopting receiver standards that are as strict as those set for transmitters. We believe that a TV receiver standard would make the whitespaces far more useful AND be good for the consumer.

It's clear that wireless broadband will be the only true third broadband rail to the consumer. Wireless broadband will be the only technology available to the entrepreneur and should be encouraged as a means of keeping the cable/DSL duopoly honest.

Sincerely,  
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