TVWS Coexistence Opportunities

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WISPA Who?

- Wireless Internet Service Providers Association
- > 400 Members (includes Vendors)
- Fixed Wireless Broadband service
- 24 million households have no broadband today
Interference Minimization

- Fixed TVBD – Fixed TVBD (Intelligent Frequency Assignment (OVAS))
- Fixed TVBD – Personal Portable Device (PPD) (OVAS)
- PPD – PPD
- Use DB to place unlicensed wireless mics on non-interfering channels, including 1\textsuperscript{st} adjacent channels.
- Use DB for unlicensed wireless mic freq. coordination at venues that are too small for protection under rules and regs.
Spectrum Sensing – Not

• TVWS is opportunity to use a “smart” geo-location database to maximize spectrum availability and broadband delivery while minimizing interference.

• Make this a successful demonstration that supports future shared spectrum allocation and use.
Distributed Spectrum Sensing

• “Please attack my network with an unlicensed wireless mic.
• “Dad, can I use the car tonight or else…”
• Perhaps OVAS, the TVWS DB should be used to validate network-wide wireless mic sensing “hits” to determine if a freq. change is possible and appropriate for fixed WANs.
Change Channels in 2 seconds!

- Another non-interfering channel available?
- If available, will it work?
- Regulators seem blithely unaware that outdoor TVWS channel changing is not quite as simple as changing to another channel on an indoor 2.4 GHz wireless access point.
- Propagation differences exist.
- Clear-channels may not be available.
54 to 698 MHz? – No Problem

• Antennas? – No problem
• Front ends? – No problem
• Low spurious? – No problem
• Silver lining – Equipment ecosystem may be able to eventually grow, adapt and bring equipment costs down to consumer levels… but by what year??
Inform Regulators

• Map actual TVWS device usage to demonstrate to regulators how using a “smart” DB can maximize the efficiency of license-free spectrum.

• Demonstrate when spectrum is becoming fully-utilized thus indicating that additional license-free spectrum needs to be allocated.
Leaky Cable?

- Cable TV industry generally opposes effective TVWS device deployment (claiming interference to cable-connected receivers).
- Map interference complaints from cable TV users to indicate areas of possibly leaky cable TV wiring plant. (OVAS)
Trust Your Higher Power

• Currently fixed TVBDs can use 4W EIRP
• Asked for up to 20W transmitter power in rural areas
• OVAS is to determine if, at a particular location, higher power is possible while maintaining interference protection for incumbents.
Licensed Pt-Pt Use!

- Licensing 6-channel blocks for exclusive use of FiberTower-Sprint to provide backhaul to rural areas makes sense for them because it denies the vitally needed spectrum for unlicensed pt-mpt use to everyone else. Great anti-competitive ploy on part of the mobile broadband industry.
Spectrum Refarming

• Yes – “Smart” TVWS DB use provides impetus to develop and demonstrate a frequency-agile ecosystem responsive to refarming.

• No – Refarming may reduce the absolute number of available TVWS channels.
Fixed TVWS

• We love it but…
• We need it and …
• FCC rules and regulations need a lot of corrective adjustments.
• The equipment ecosystem will need to respond appropriately so we (WISPs) can do our part.
• Opportunities abound to deliver OVAS.
• “Mine” the GOLD (GeO-Location Database)