

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 1st 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**)