

Weightless and white space in the UK

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- That billions of devices would benefit from being connected
- But that this has failed to happen to date because there is no suitable standard and network
- White space spectrum provides a new opportunity - plentiful, free, harmonised world-wide ,excellent propagation
- However, it is also problematic to use with pollution from TV transmitters and interference from other users
- Need a new bespoke technology optimised for M2M in white space that can become the global standard



M2M application requirements



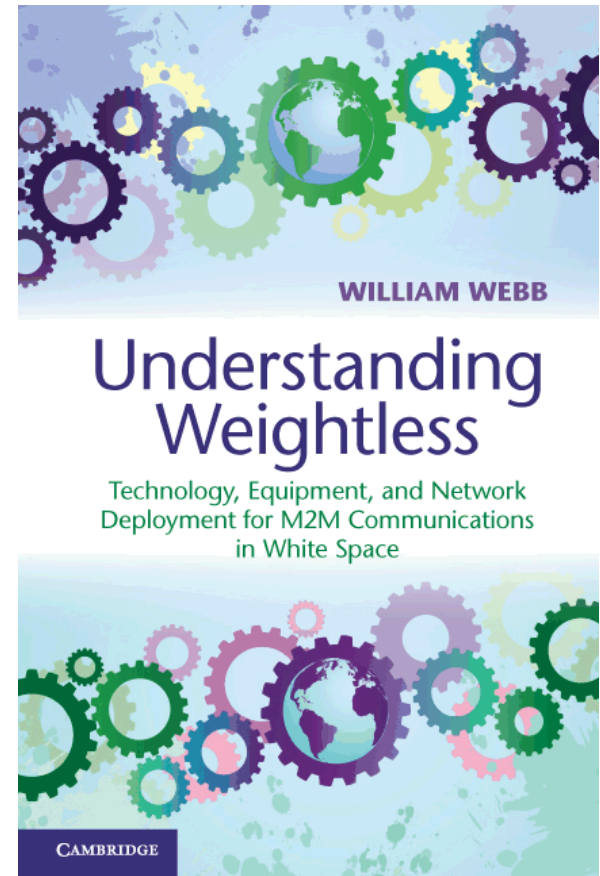


- Great flexibility in the data rate provided depending on the application, range and environment
- Time division duplex (TDD) operation since there are no defined uplink and downlink bands within the white spaces
- Frequency hopping to minimise the impact of interference - both received and caused
- Variable spreading factors from none to 256 enabling a 30dB difference in link budgets to increase range or accommodate low power devices
- A technology that enables low-cost base stations and devices including low power consumption within the devices
- Turned into a global, open, royalty-free standard through the Weightless SIG





- “Understanding Weightless” (available from Amazon, etc)
- Join the Weightless SIG to be part of the eco-system and get the full specification (www.weightless.org)





- Consortium included regulator, broadcasters, PMSE industry, and white space community
- Network of 6 base stations used for tests and some early M2M trials plus two rural broadband links
- Detailed tests of interference into TV receivers and PMSE equipment
- No interference reported even with co-channel BTS on theatre roof
- Much evidence gathered on minimum coupling loss and similar
- It works in practice, no need to continue to question whether it works in theory





- Near completion – key documents expected into ETSI shortly and legal documents by end 2012
- In overview the same as the US
 - Use of a database, similar power levels and emission limits, etc
- But somewhat more flexible
 - No set power output – database provides highest power allowed in that location
 - No predetermined rules on eg avoidance of adjacent channel, database calculates what is possible for each device
 - Multiple device classes to allow for eg low-cost poor emission devices
 - Allowance for narrowband transmissions with equivalent power to broadband
 - Realistic calculation of TV coverage, not simple coverage contours
 - Possibility of access to 8 cleared channels in 600MHz for 5-10 years
- All adds up to very much greater availability of white space



- Some countries – eg Finland – moving ahead with trials and regulation
- But most European countries awaiting guidance from EC / CEPT
 - Some reasonable technical work in CEPT SE43 but rather conservative and “drafted by committee”
- Not much indication of a desire to promote innovation!
- Likely that most of Europe will be a follower rather than pioneer
- Unclear whether EC will force the pace
- It will be for the UK and US to blaze a trail (and reap the rewards) and others to copy