What are white spaces and why do they matter?

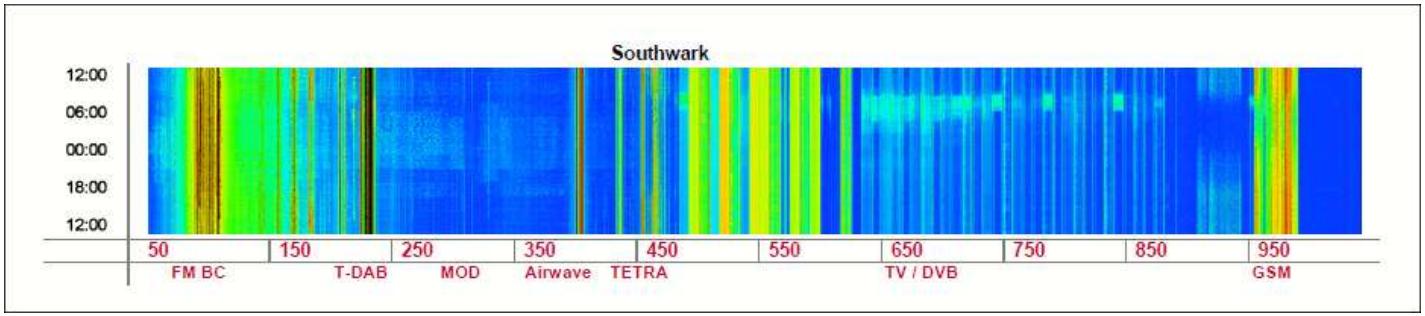
Inaugural event of the

Centre for White Space Communications

22nd January 2013

Growing wireless data demand, but the spectrum is apparently full

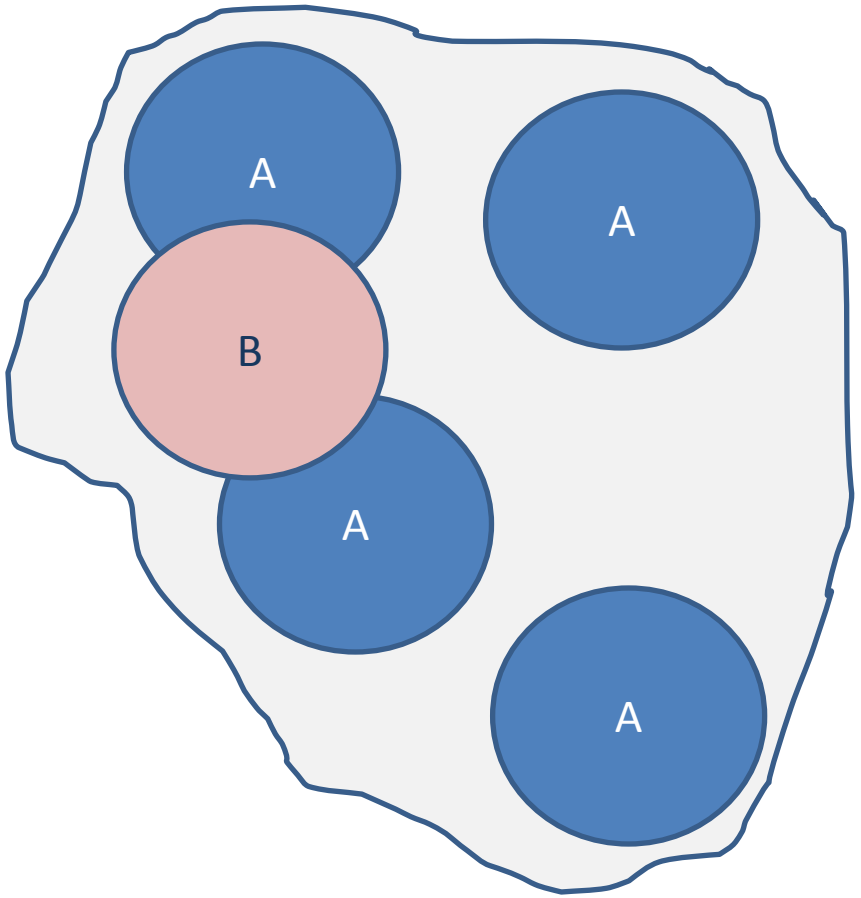
Or is it?



Source: Ofcom, Spectrum Framework Review 2004

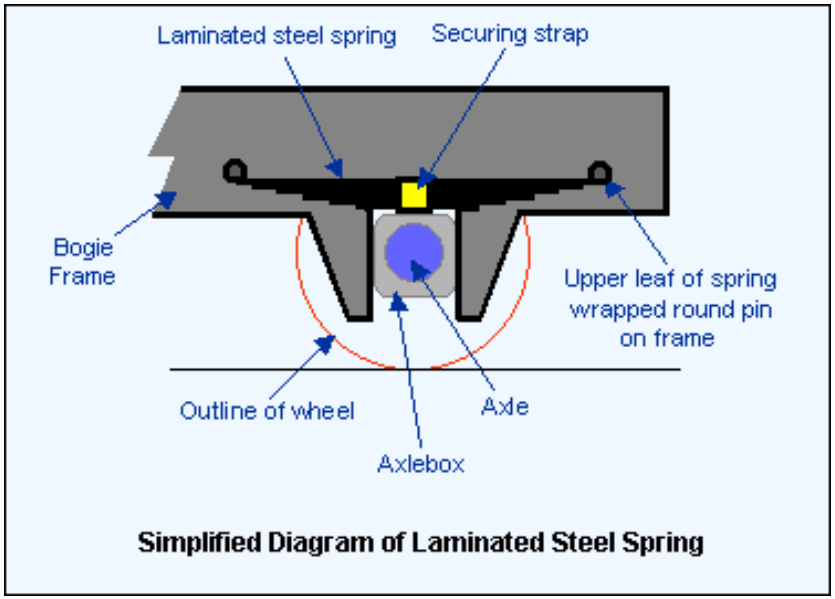
What are TV white spaces ?

- Within the spectrum retained for terrestrial TV (in Europe this is 470 to 790 MHz)
  - Uncovered gaps left between transmitters using the same frequency
  - For any given location – a number of these channels are not used to provide television services



Dynamic Spectrum Access is key to harvesting the white spaces

- Getting the most out of TV white spaces capacity requires a sophisticated approach
- TV white spaces capacity is
  - By its nature fragmented (time, place, frequency etc.)
  - Is subject to varying background noise and interference, from the services sharing the band
  - Is constrained in the Power /capacity trade-off available to applications - by the reception rights of services that are sharing the bands



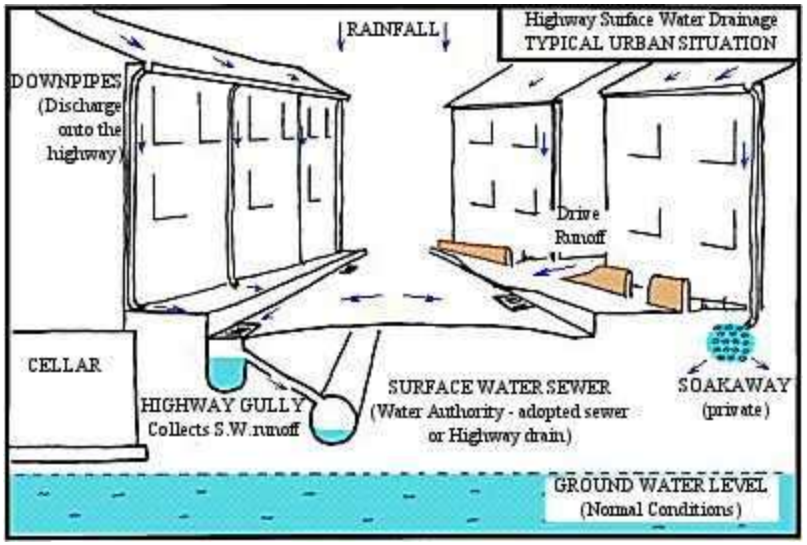
Simplified Diagram of Laminated Steel Spring

Dynamic Spectrum Access to TVWS Future of Wi-Fi & Internet of Things

- In its 802.11af variant, Wi-Fi will include TV white spaces
- The Internet of Things will be facilitated by the combination of cost-effective wide area coverage potential and licence exempt use

Dynamic spectrum access will enhance hotspot capacity and reach

- Think of the analogy of rainwater soak-aways – just for a moment
- So not only to we need to get fibre as close as possible to end users, but we also need to open as many wireless paths to each fibre access point as possible, to allow devices within range to benefit from that capacity – the shorter the wireless tail, the better the performance ….



Cambridge & Bute trials have demonstrated the value of working together

- The Centre for White Space Communications has arrived at the right time, with the right expertise and focus
- It can play a key role in helping industry and regulators achieve more efficient sharing – and harvest greater value and innovation from the white spaces
- One day all spectrum may be white spaces ….

Thank you!

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Further reading

- Further information about the Cambridge Trial may be found here
- The trial reports are available here (recommendations) and here (technical)
- A major new report, commissioned by Microsoft, on the expected economic benefits of licence exemption may be found here

Summary of how white spaces can help

- Looking across the spectrum sweet-spot (100 MHz -3 GHz) there is a massive amount of unused capacity [spectrum observatory charts]
  - Fragmented (time, place, frequency etc.)
  - Varying degrees of contamination (background noise and interference) - depending on the height of the receiving antenna and what's around it
- Power /capacity trade-off is limited by reception rights of services that are sharing the bands
- Range depends on the margin between power limit and background noise + interference level – which
- Technical challenges, but in the absence of cleared spectrum ….. enabling access to the capacity for end users promises an array of benefits
- **Dynamic Access is the key** to unlocking these benefits and enabling the next phase of wireless innovation