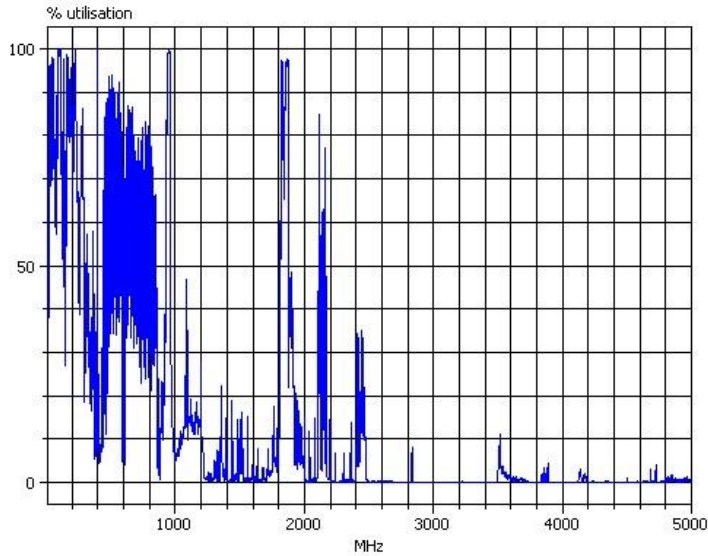
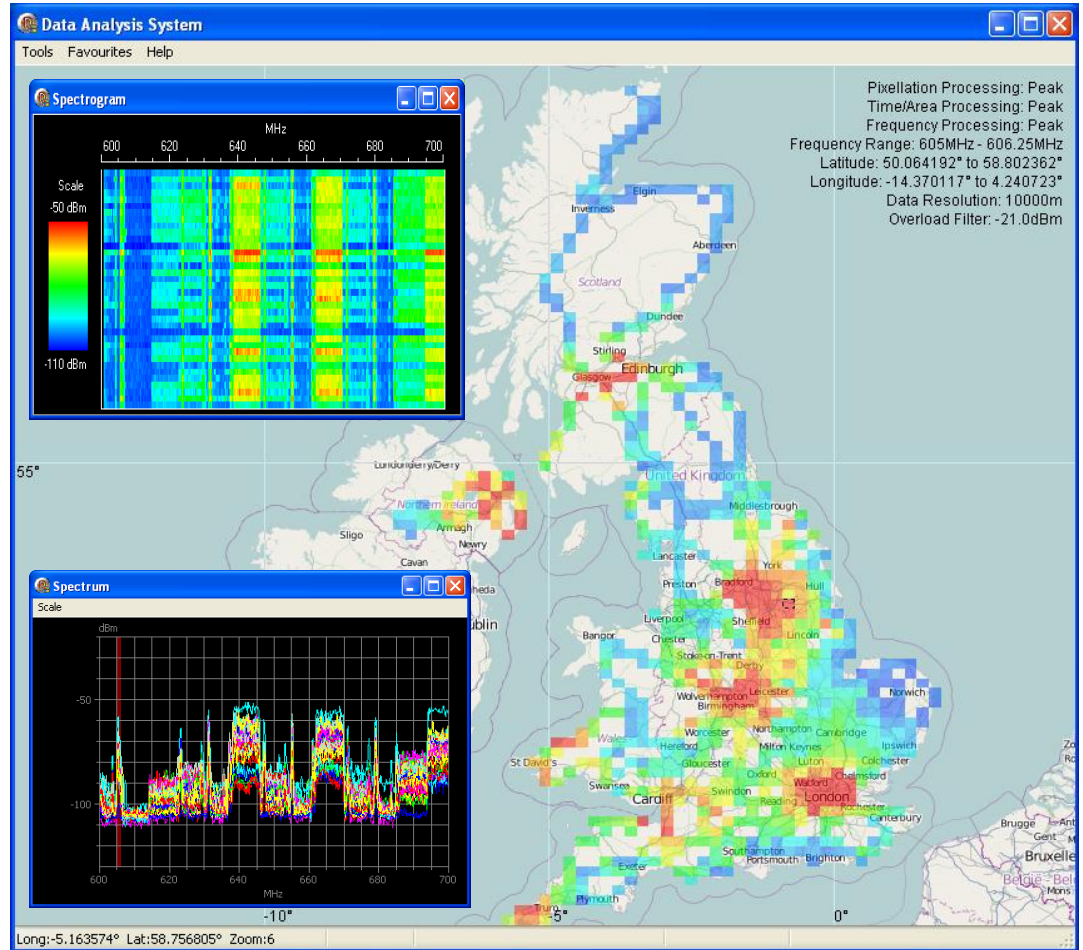


CRFS – Thinking Spectrum

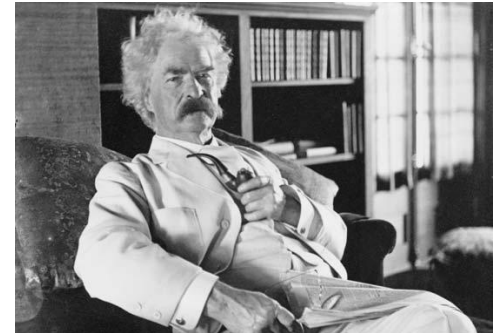
Quantifying Spectrum Usage



Spectrum Utilisation as measured across the UK



- Is spectrum really scarce ?
 - New technologies enable increased usage from same amount of spectrum (at some cost in complexity – as usual)
 - Simple (and ‘static’) solutions increasingly ineffective
- Needs, expectationsand dependency continue to increase
 - Relentlessly upward curve
 - Mobile bands (400 MHz – 3 GHz) under special pressure
- Spectrum a key enabler for economic growth and security in a modern society
 - Not just for entertainment and convenience

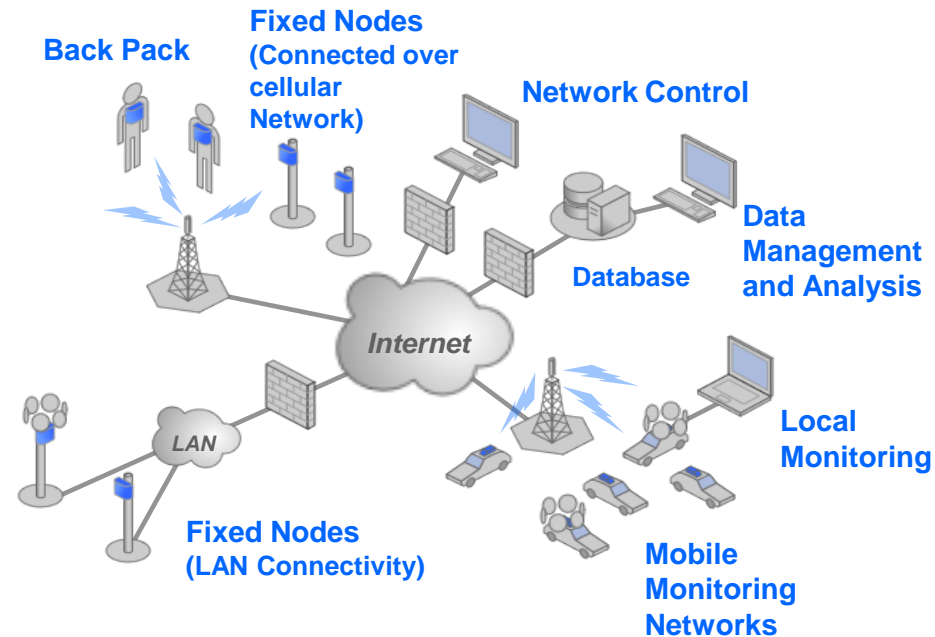


*‘Buy land, they’re not making it anymore’
(Mark Twain)*



*‘Please Sir, can I have some more’
(Oliver)*

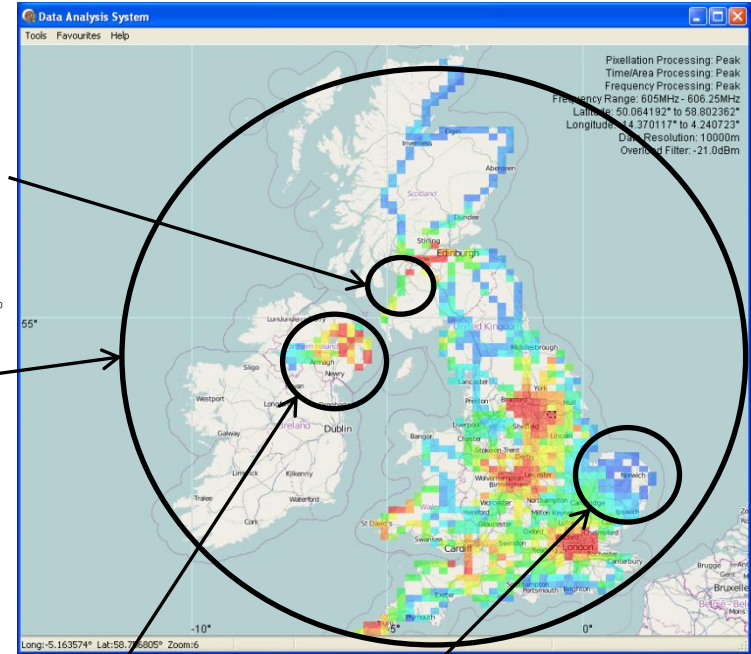
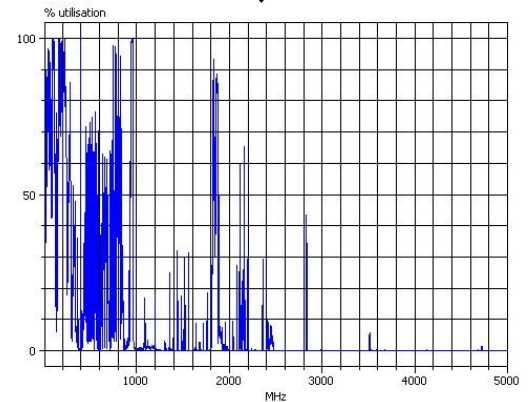
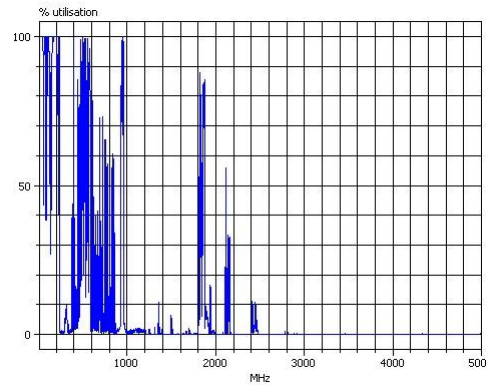
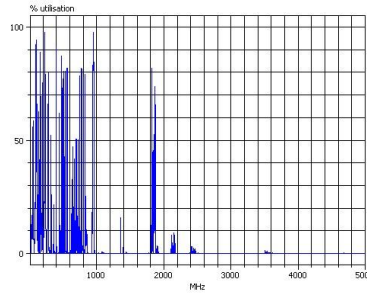
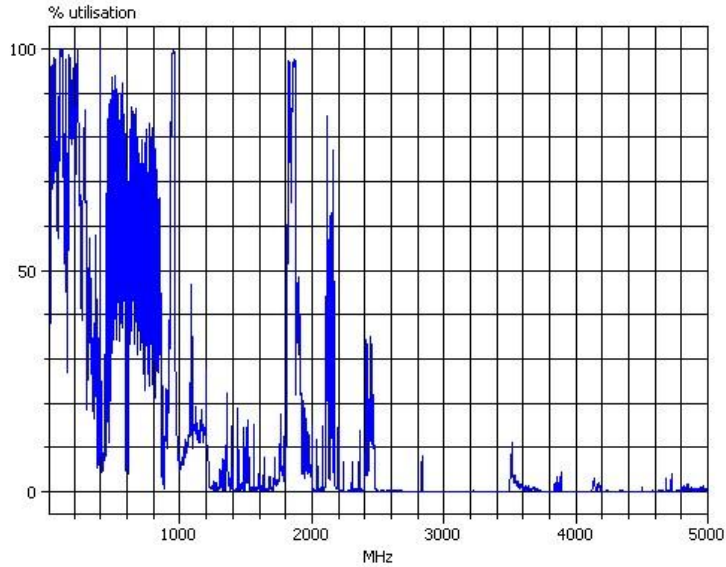
- New approach to spectrum monitoring required
 - Proactive rather than reactive
 - Ready availability of spectrum information
- System requirements:
 - Broad frequency range, good radio performance
 - Low cost, unattended system: automated, intelligent data capture
 - Dense monitoring networks: 'measure where it is being used'
 - Good network management and data management/analysis tools
 - Background monitoring for long-term trend analysis, foreground monitoring for resolving issues

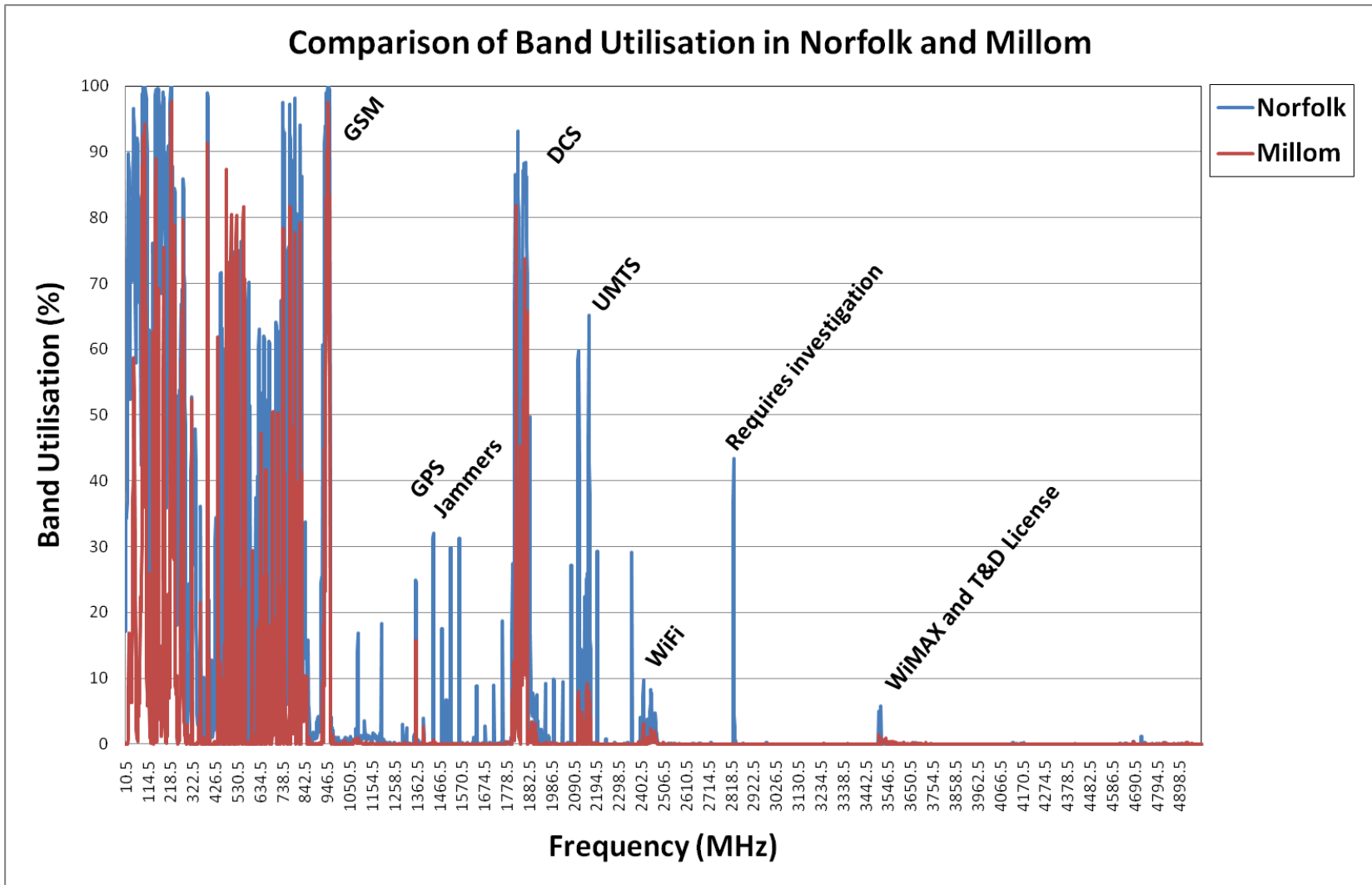


RFeye Monitoring Node

Spectrum Utilisation Database

Thinking Spectrum.....

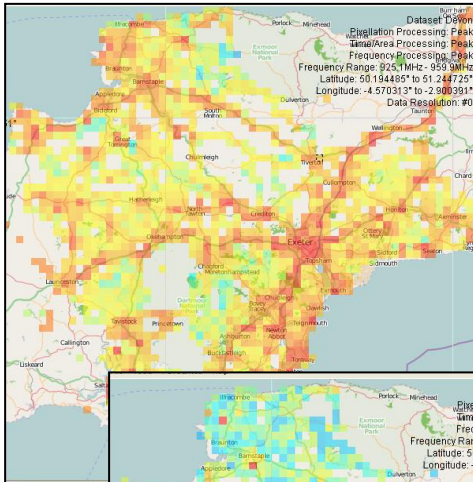




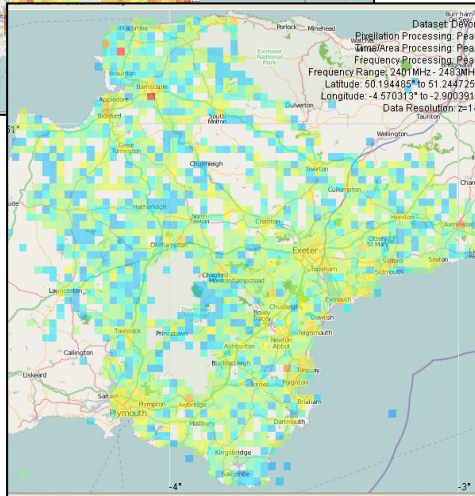
Case Studies (1)

Database for Devon, UK

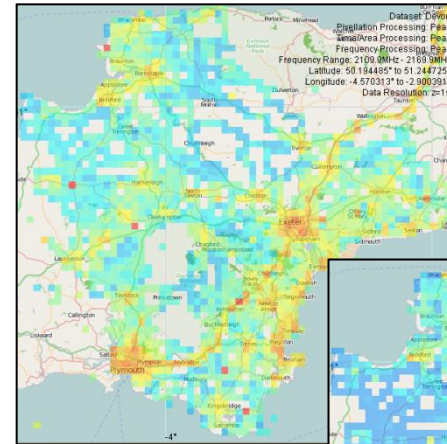
**GSM900
coverage (all
operators)**



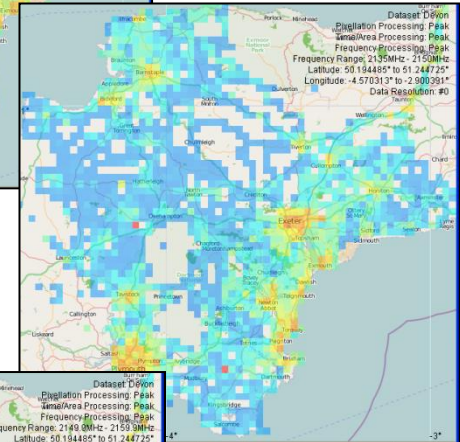
**2.4 GHz ISM
band usage**



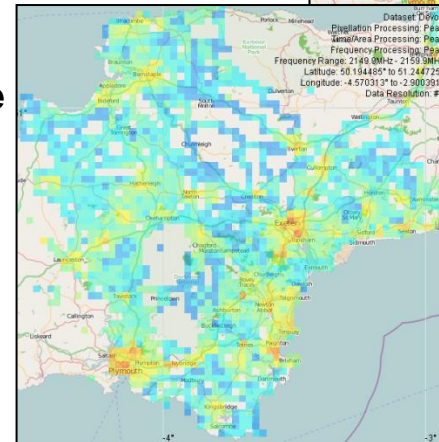
**3G coverage
(all operators)**



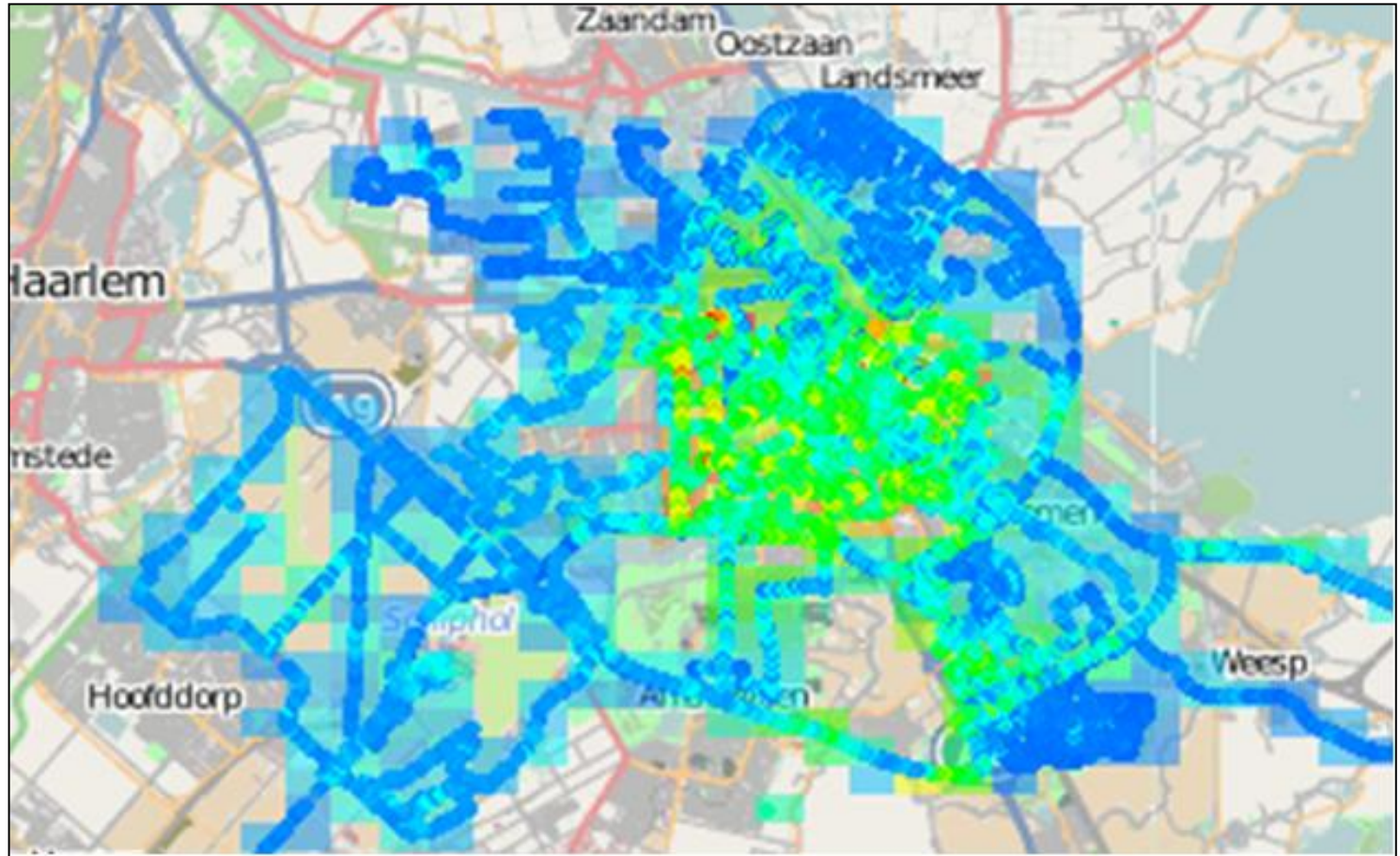
**3G coverage
(operator A)**



**3G coverage
(operator B)**



3.6 GHz Transmissions in (Amsterdam) from European Database



Thank You

Thinking Spectrum.....

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