

Traffic Control, Communications Systems and  
Traveller Information for Public Transport and  
Freight Logistics Conference

WiMAX Communications <sup>11<sup>th</sup> September 2008</sup>

Infrastructure: Strategy and  
Implementation

Metranet Communications

Roger Horlock

The logo features a stylized graphic above the text 'metranet'. The graphic consists of a series of vertical bars of varying heights, resembling a signal or data waveform, with a cloud-like shape on the right side.  
metranet

# Introduction to sub-project

- **The Reading Metranet is a wireless communications infrastructure allowing the realtime delivery of a range of transportation data and integrating that with Reading Borough Council's Urban Traffic Management Control.**

# Project Goals

- **To deliver a reliable realtime (second by second) transportation data infrastructure.**
- **Metranet built the core infrastructure for the delivery of UTMC SCOOT data (integrating with Siemens), CCTV (supplied by Tyco), data to / from buses (Connexionz), VoIP over Wi-Fi.**
- **2 core network elements:**
  - **City Centre Mesh – Airborne Networks**
  - **Point to MultiPoint WiMAX - Alvarion**

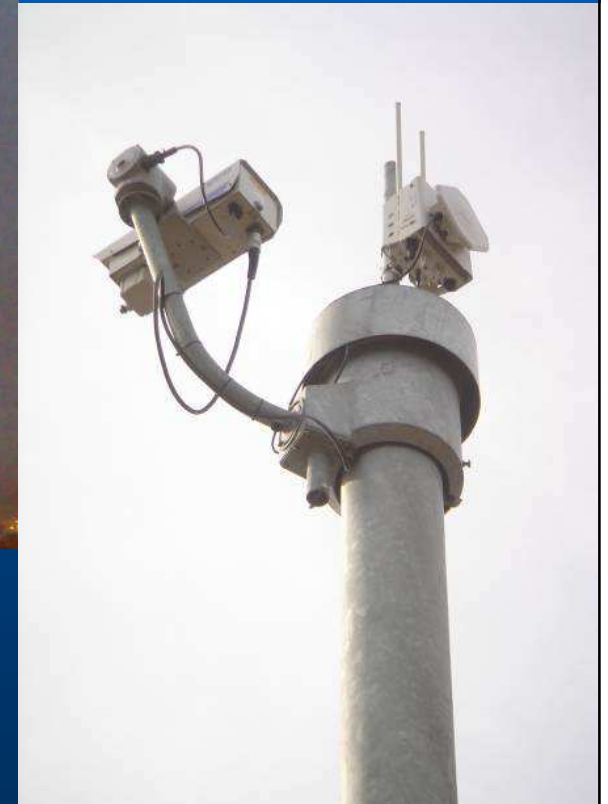


Alvarion BaseStation



Access Unit  
Located at  
Fountain House

Subscriber Unit  
& CCTV Camera



# WiMAX & The Importance of Spectrum

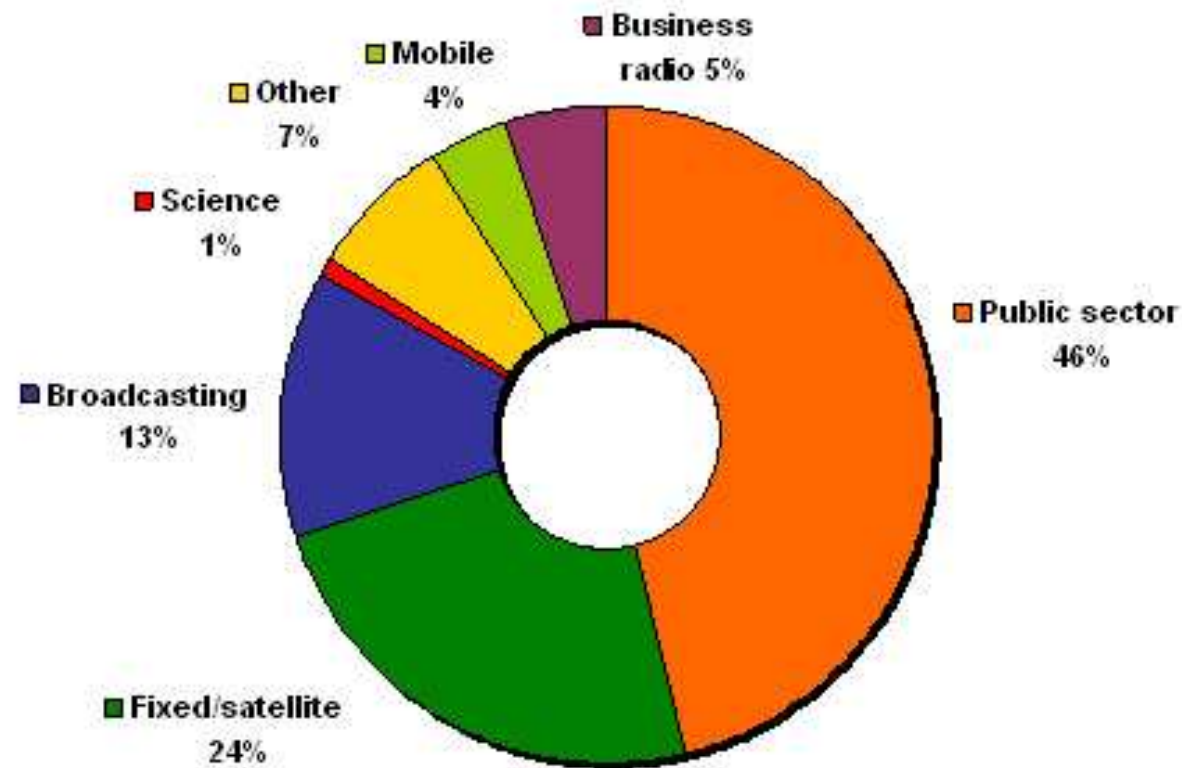
- **WiMAX - Worldwide Interoperability for Microwave Access. Hardware partner – Alvarion. 802.16d deployment – “fixed WiMAX”.**
- **Availability of radio spectrum is fundamental. Previously, councils could only build a wireless network in unlicensed spectrum, namely in the 5GHz frequency band.**
- **No guarantee that the network will not suffer interference from other unlicensed spectrum users in the locality.**
- **Mission critical applications need to be protected by licences. The spectrum landscape is changing.**

# The Issue of Spectrum

- **No dedicated public safety spectrum allocated for high bandwidth data in the UK – led to a joint strategy of Metranet, Peter Brett Associates and Reading Borough Council - achieved match-funding from SEEDA which had a clear focus on innovation.**
- **Metranet built using a Non-Operational Licence (Test & Development Licence) issued by Ofcom and through liaising with the MoD. This has been renewed.**
- **T&D is a temporary measure – in 2004 Pre-Budget Report, Chancellor of the Exchequer commissioned an Independent Audit of Spectrum Holdings (known as The Cave Audit). Ofcom valuation £40-42B GDP p/a. 0-17/18GHz. 40% of the spectrum hasn't been released. Cave Audit values £2-22B GDP p/a. The Reading project responded directly to the findings of the "Cave Audit" and the Government's Response.**

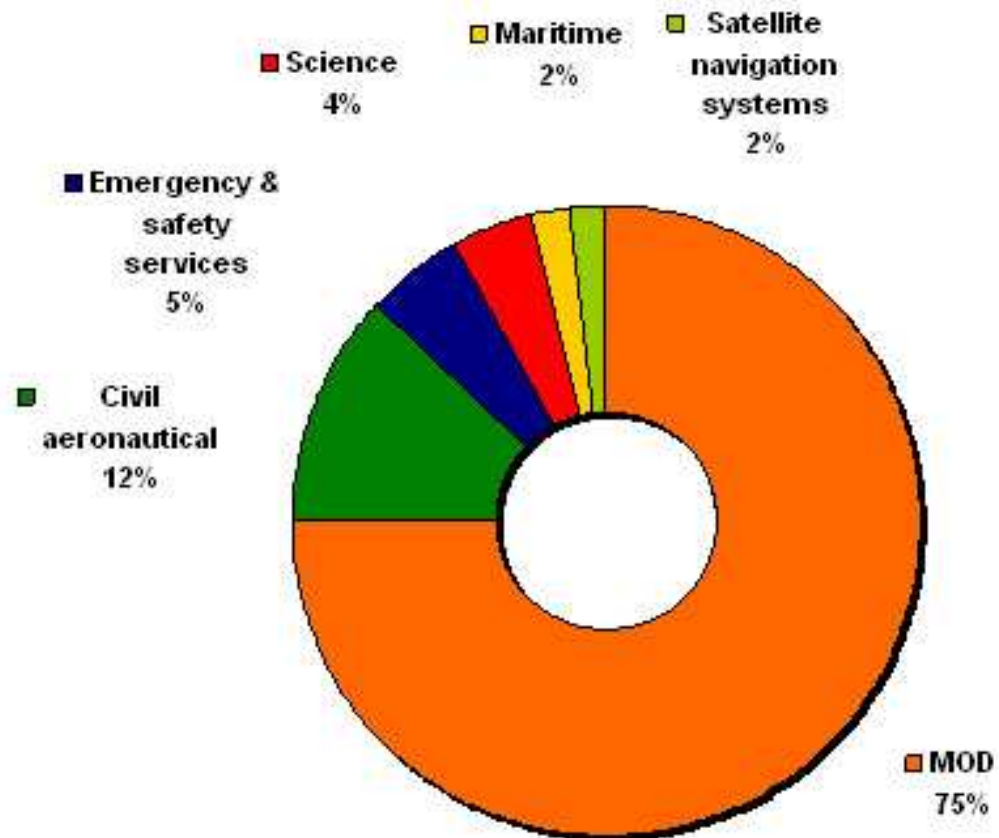
# Source: Ofcom

Figure 1: Use of UK radio spectrum



# Source: Ofcom

Figure 2: Public sector spectrum holdings below 15GHz



# Ofcom Statement: 31|01|08

- Ed Richards, Chief Executive of Ofcom, said: “Public bodies and the MoD in particular hold some of the most valuable and sought-after radio spectrum. By working with these organisations we are enabling them to trade and release this spectrum which will create new opportunities for the development of wireless services for the whole country.”
- The statement can be found at: <http://www.ofcom.org.uk/consult/condocs/sfrps/statement/>

# AIP (Administered Incentivised Pricing)

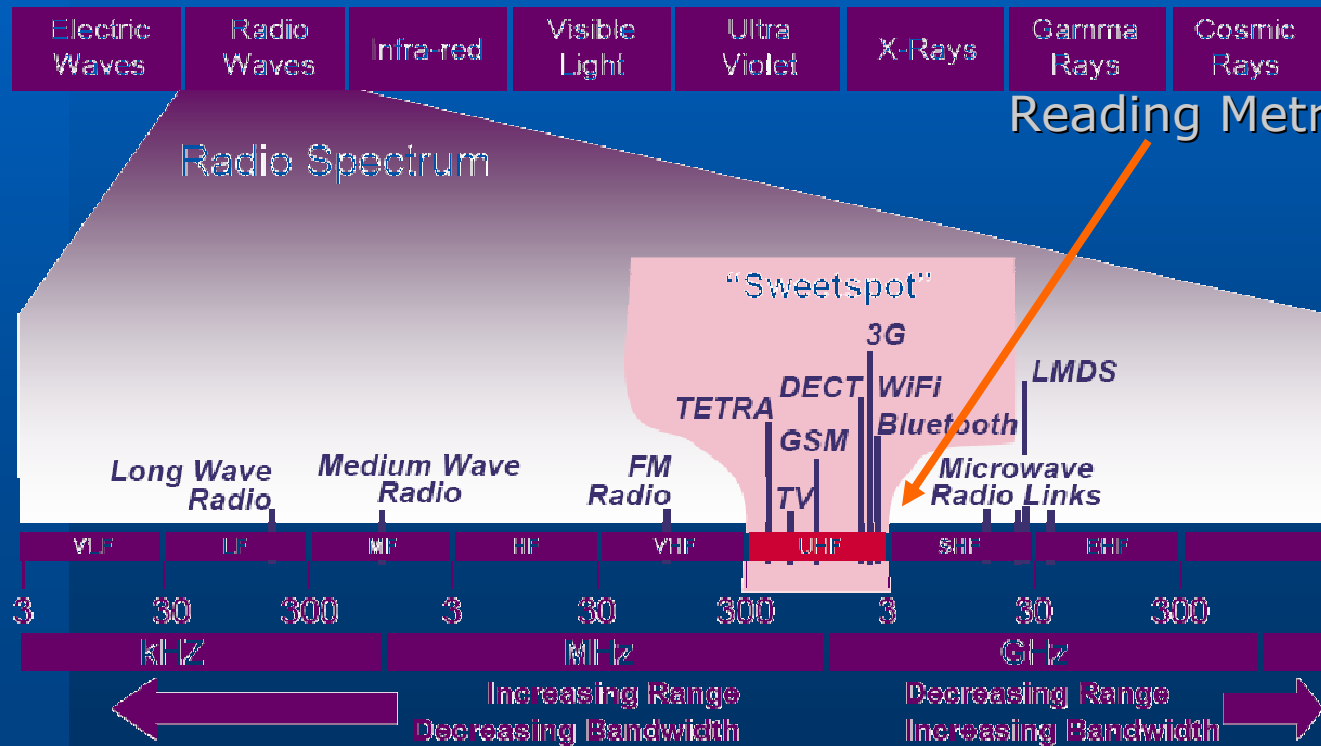
- The Ministry of Defence must release spectrum for band-sharing where Defence of the Realm is not compromised otherwise AIP (Administered Incentivised Pricing) will be levied. £252k/MHz. £300M.
- The Cave Audit asked for a “test facility”: the network in Reading is one such facility and indeed the first and only network of its kind in the UK or Europe.
- MoD policy announcement expected in December. Next key date in the process is May 2009. There is a potential for Pioneer Licences to drive the market forward.
- The Reading Metranet demonstrates the business model for band-sharing with MoD, allowing revenue to be passed back to the Treasury through the AIP process.

# MoD Consultation Response

- **Metranet has responded on behalf of the SEEDA project to MoD's "UK Defence Spectrum Management: A Consultation on: An Implementation Plan for Reform" Issued: 30 May 08.**
- **Major shift between Cave Audit position and MoD in priority of frequency bands to be released from 2.7-3.4GHz to 3.4-3.6GHz.**
- **Not enough emphasis on mitigation technologies which can eliminate interference on MoD administered frequencies.**
- **If a strategy of mitigation is embraced by the MoD then:**
  - **MoD would not have to relinquish control of any spectrum with spectrum being released through a band-sharing process.**
  - **More spectrum would be released into the market, creating higher bandwidth opportunities.**
  - **Cave Audit figures indicate up to a maximum differential of £20B in GDP per annum.**

# Source: Ofcom

## The Radio Spectrum



Reading Metranet

# Performance of The Reading Metranet

- **Constructed on 3.3GHz, using a system supplied by Alvarion, Metranet has found that we can pass 6Mbps using 5MHz channels. 10Mhz channels would have been preferable.**
- **Quality of Service (QoS) allows us to prioritise specific data packets such as CCTV, SCOOT, data to buses.**
- **Evaluation conducted by Southampton University TRG has shown that communications errors have been lower with the wireless system compared with the wired alternative.**
- **Similarly, CCTV image quality has not been compromised: RBC Video Demonstration**

# Evaluation Of SCOOT Data

- Transport for London have agreed to help review the quality of SCOOT data being transmitted over the Reading Metranet.
- SCOOT data will be passed through TfL's analysis tool to determine the operational error performance compared with TfL traditional copper wired system.
- RBC offering TfL access to Siemens UTMC Alpha unit.
- Similar data access can be given to other local authorities including completely transparent monitoring information

# The Future

- **Clear opportunity for further innovation with Reading Borough Council, building on the success already achieved.**
- **Ramifications for other agencies such as the Police and other blue-light services.**
- **Ideal opportunity to begin discussions with other transport departments, bearing in mind the MoD's timescale and the natural planning lifecycle of such projects.**
- **Key benefit of the Reading Test Facility: risk is mitigated leaving little or no exposure to new initiatives with other local authorities.**
- **Building dedicated wireless infrastructures for type-approved digital CCTV systems (eg. BLE and other roadside traffic contraventions) will allow local authorities not only to reduce much of their ongoing revenue spend but create a more reliable infrastructure.**

# Further information

- **Submit questions to:**
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