

International Telecommunication Union

GSR 2008

Discussion
Paper

Comments are welcome and should be sent by 13 April 2008 to GSR08@itu.int



GSR 08: Session 4 **Spectrum Sharing**

Adrian Foster
McLean Foster & Co, Canada

Topics

- ◆ Spectrum Sharing
- ◆ Framework – Structure, Options and Tools
- ◆ Practical Steps
- ◆ Country Examples

Spectrum Sharing

- ◆ Spectrum sharing encompasses several techniques – some administrative, technical and market-based. Spectrum can be shared in several dimensions; time, space and geography.
- ◆ Demand for spectrum is increasing and frequency bands (below 1GHz) are becoming more congested especially in densely populated urban centres.
 - Spectrum can be shared in several dimensions; time, space and geography;
 - Diverse approaches to sharing frequencies some administrative, technical and market-based. : inband sharing, leasing and spectrum trading, and use of unlicensed spectrum commons combined with the use of low power radios or advanced radio technologies including ultra-wideband and multi-modal radios.

Framework

- ◆ International, Regional and National
 - Allocations – Tables of Frequency Allocations
 - ◆ The WRC-07 has made significant strides increasing the amount of spectrum available to broadband services
- ◆ Spectrum management mechanisms include:
 - Command and control
 - Market based
 - Flexible spectrum management
 - Spectrum sharing (Overlay and Underlay)
 - Spectrum commons

Opportunities and Challenges

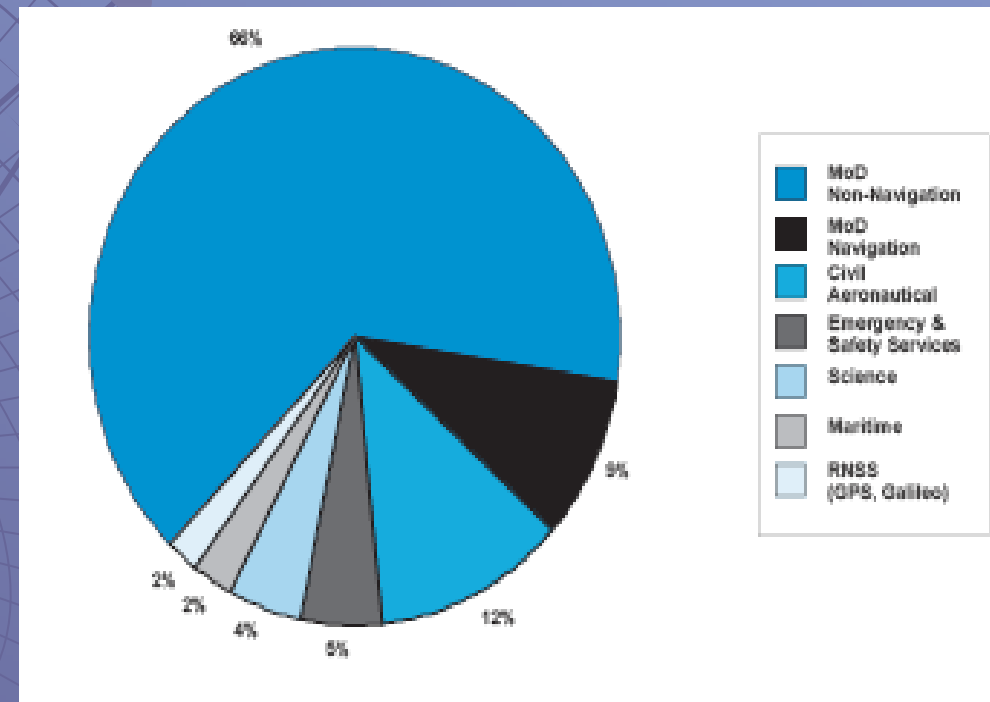
	Opportunities	Challenges
Command and Control	Centrally managed and planned Low risk of interference	Slow Requires managers to make technology choices Suboptimal efficiency
Market Mechanisms	Promotes efficient usage. Gets spectrum to the users who value it most	Possibility of hoarding Windfall gains Fragmentation
Flexible Use	Potentially efficient use of spectrum Prevents artificial scarcity and high values of spectrum	Perceived increased risk of interference Relatively untested
Sharing	More efficient use of spectrum that is already allocated	Requires some management Potential for interference Fragmentation
Commons	Promotes innovation Lower cost of regulation	Potential interference 'Tragedy' of commons Untested (except for short range applications)

Source: Commission for Communication Regulation, 2007



Spectrum Availability

- ◆ Significant blocks of spectrum are allocated for government use often for military and other ministry communications systems. As reported in the to the UK Gov't in 2005, government holdings of spectrum approximate 50% of the spectrum below 15GHz.
- ◆ The relative share of spectrum between various government services is illustrated .
- ◆ Independent Audit of Spectrum Holdings (the Cave Audit)



Key Considerations

- ◆ Planning
 - Current and future spectrum uses which bands how and when they should be released, auction for example.
 - Consultation with various stakeholders and with industry fora – ICTA and OFTA WiMax Consultations.
 - At a minimum careful review and understanding of recent decisions at WRC and leading regulatory initiatives.
- ◆ Assessing Demand and Scarcity
 - Developing countries an absence of real scarcity demand for advanced services beginning to emerge serve on the introduction of spectrum sharing policies and assignment practices.
 - ◆ Impact of delay on the economy overall coming from investment and productivity.
 - ◆ Creation of attractive markets for investors who can deploy or utilise advanced services and technologies should not to be ignored by spectrum policy makers.

Key Considerations

- ◆ Valuing Spectrum
 - Opportunity cost and economic efficiency
 - Special situations for government spectrum
 - Compensation to existing users
- ◆ Market Liquidity
 - Depth and breadth of market - sufficient liquidity to provide participants with a reliable method of transacting.

Practical Steps

- ◆ Spectrum Use Studies
- ◆ Spectrum Planning
 - Consultation
- ◆ Spectrum Release
- ◆ Spectrum Authorization Reform

Examples

- ◆ Brazil 2008
 - ANATEL in Brazil issued licenses 4 licenses per licensed area for 3G wireless deployment in the whole country. Operators are allowed to share network components such as towers as well as spectrum in order to provide services in municipalities with less than 30,000 inhabitants.
- ◆ EU 2005
 - The EU now proposes that one-third of the spectrum below 3GHz could have flexible usage rights and be tradable by 2010.
- ◆ Hong Kong 2004-2006
 - Consultations with stakeholders to obtain input on issues related to specific bands for BWA, e.g. 3.5 GHz



Examples

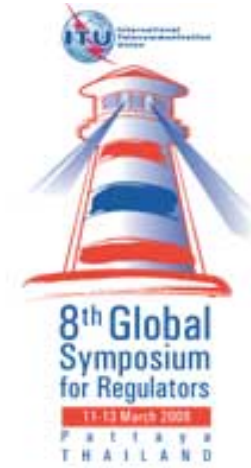
- ◆ Mauritius 2005-2006
 - ICTA conducted public consultations on proposed BWA frequency band allocations, technical characteristics and regulatory requirements and issued its decisions within 3 months. Those decisions opened the 2.5 GHz band for Mobile and Nomadic BWA (IMT-2000) applications by 2010, the 3.5 GHz band immediately for Fixed BWA and the 5.1-5.3 GHz band for low power in-building applications. In 2006, ICTA additionally opened the 5.4 GHz and 5.8 GHz bands for BWA.
- ◆ Mexico 2005
 - After two years of research, consultation and tests, COFETEL, announced unrestricted bands subject to specifications of technology and of operation that minimize the probabilities of harmful interference in the 902-928, 2400-2483.5, 5.150-5.350 and 5.725-5.850 MHz bands for broadband internet access provisioning.
- ◆ USA 2004
 - The UMTS/HSPDA service in the United States was launched by the end of 2004 strictly using the existing 1900 MHz spectrum sharing the allocation with 2G PCS services.

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Thank you!

adrian.foster@sympatico.ca

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