

International Experiences in Market-based Approaches



Improving Spectrum Management Through
Economic or Other Incentives

NTIA/National Academies

Topic 3
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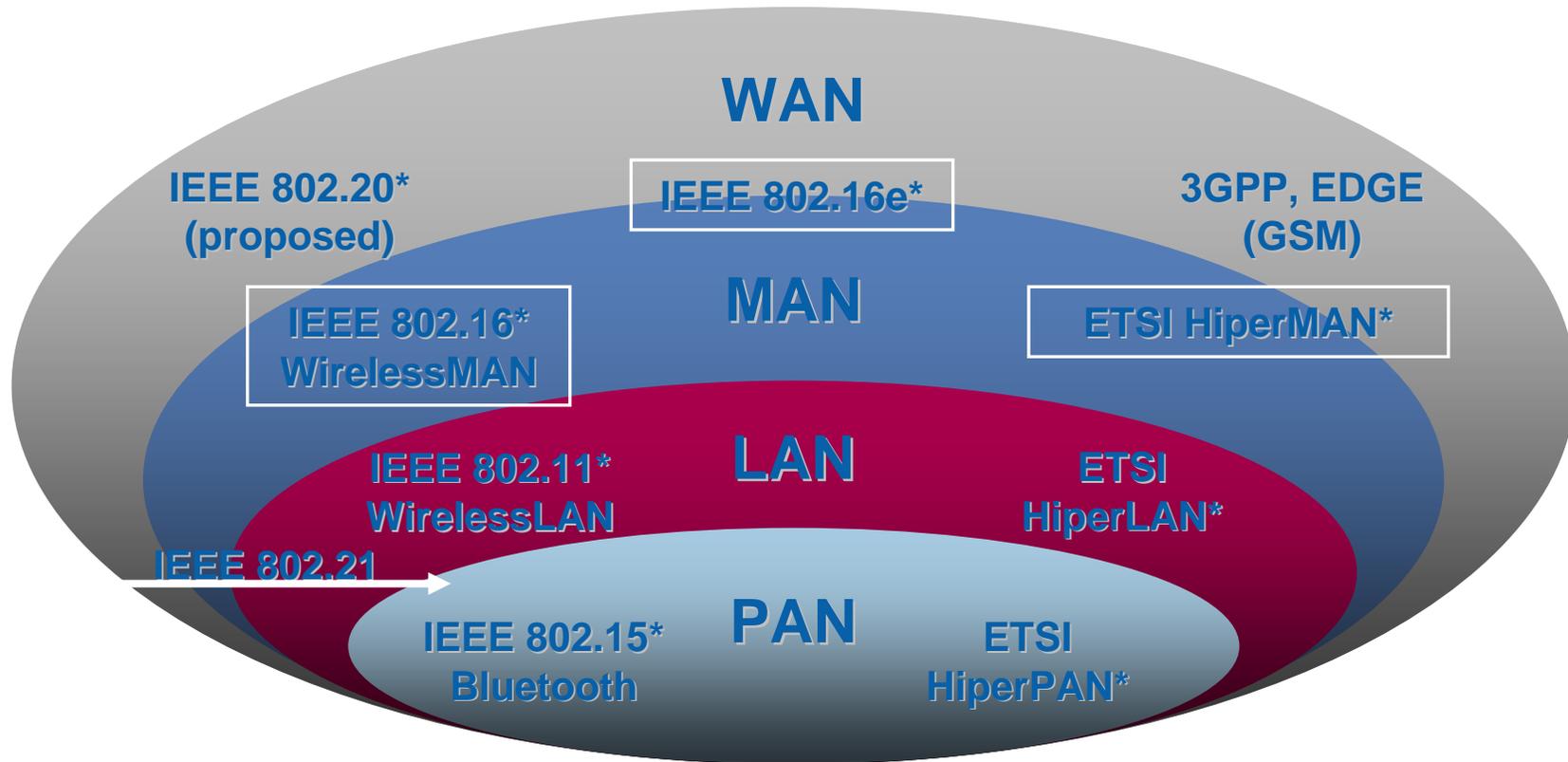
Agenda

Technology Abundance

Artificial Spectrum Scarcity

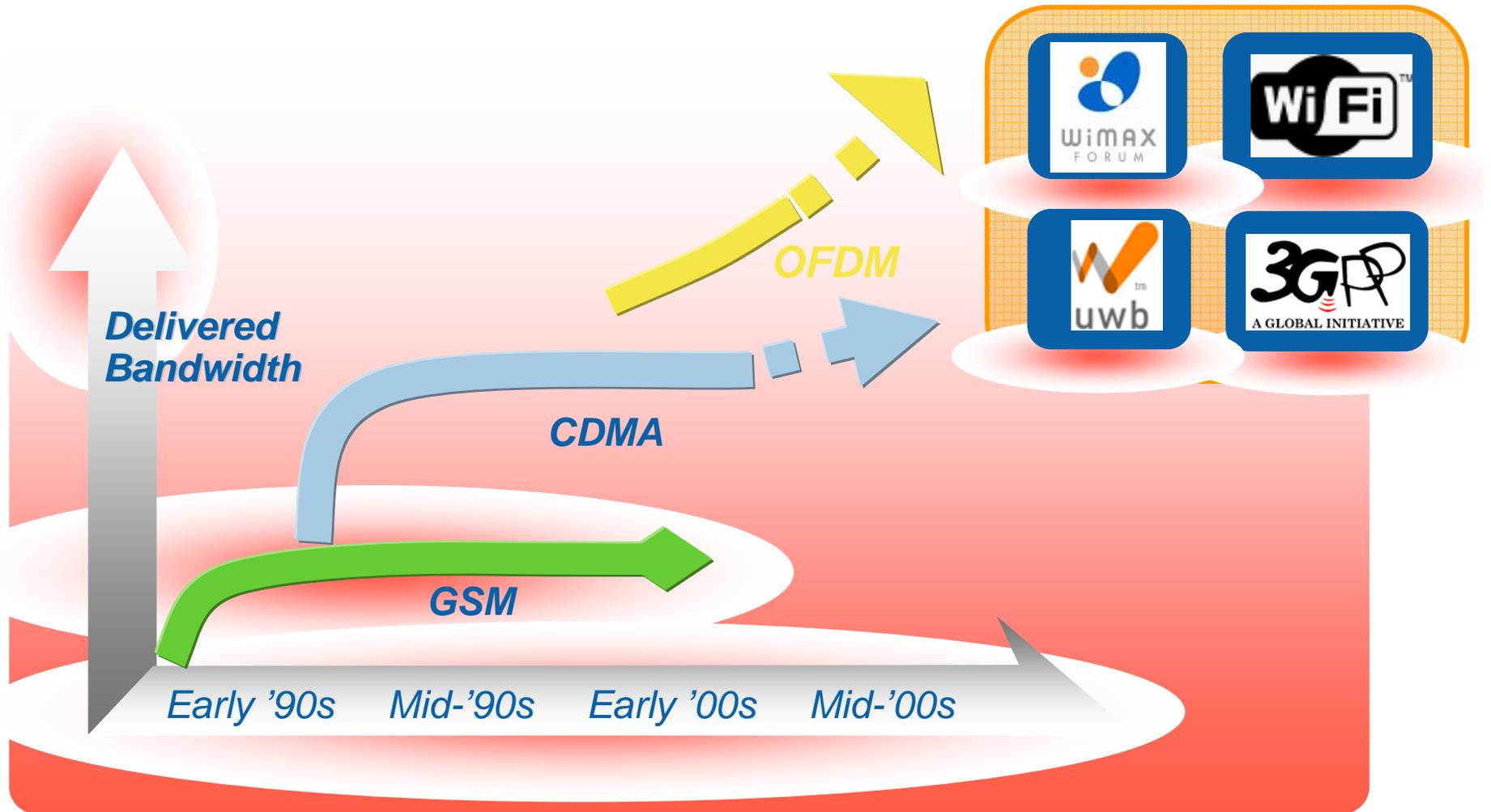
Incremental Reforms

PAN to WAN – Continuum of Wireless Standards

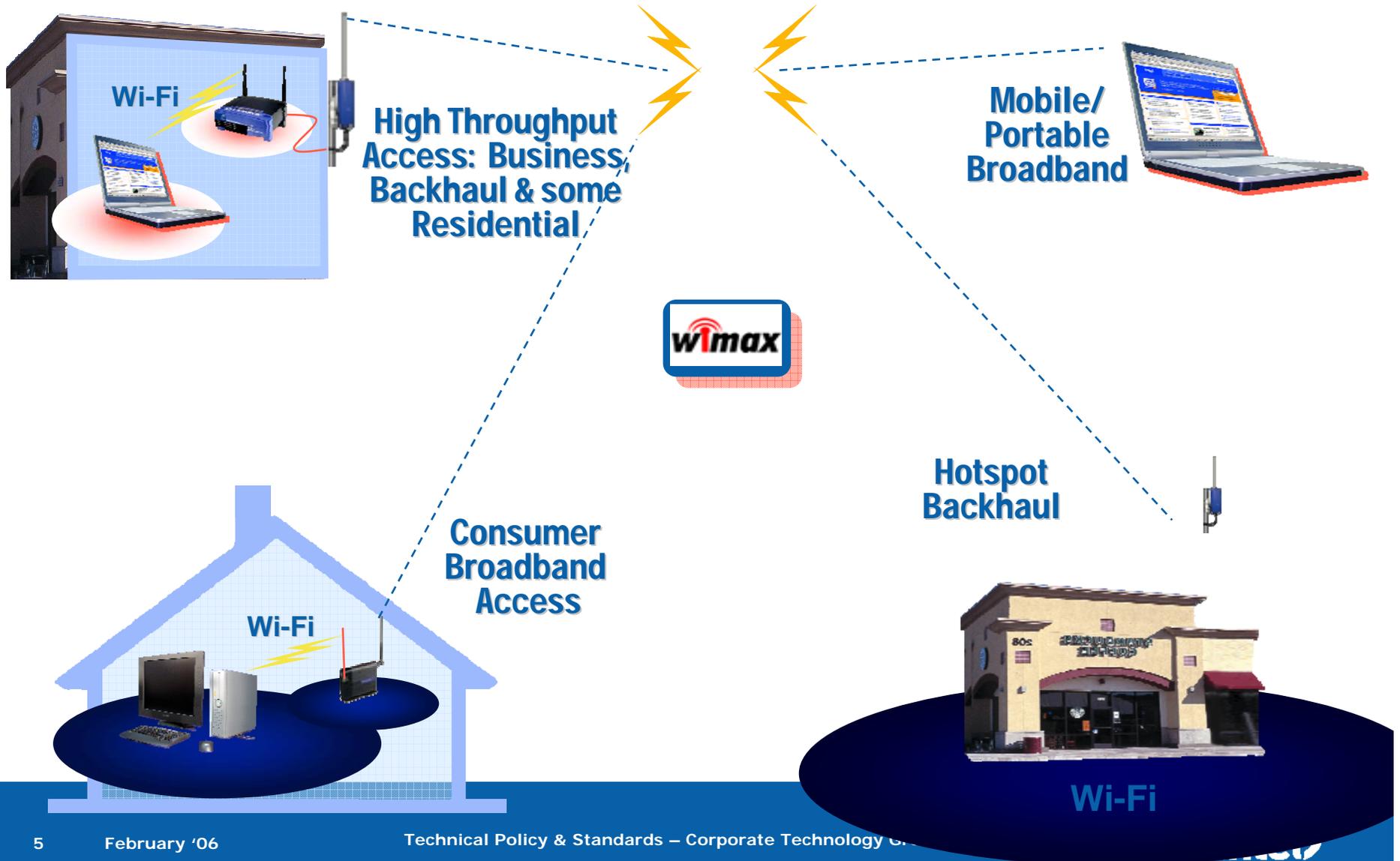


The sweet spot for each standard is unique.
There will be overlap at the edges.

The Next Wireless Transition: OFDM



Intel WiMAX Vision



Bright Spots Today

WiMAX Forum manufacturers have 1000's of Broadband Wireless Access deployments in over 130 countries

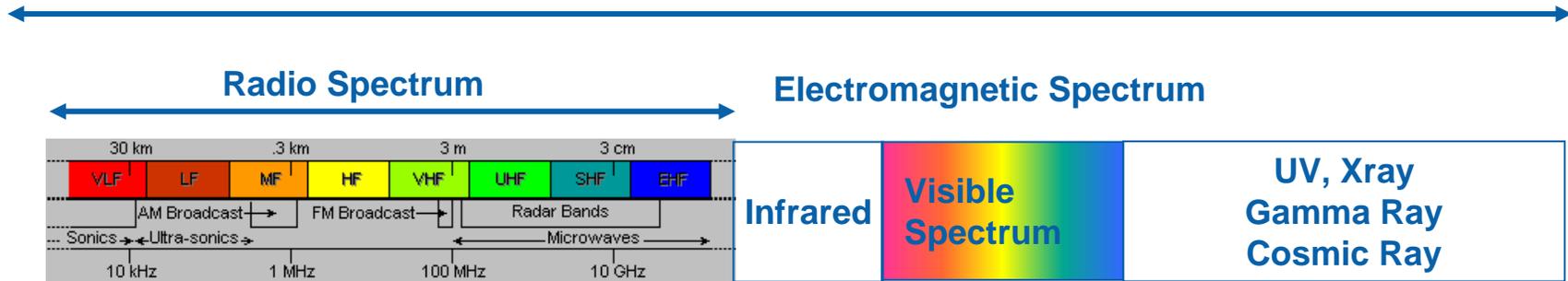
- Millions of subscribers using pre-802.16 standard, proprietary equipment from Forum members

The Forum has over 200 members, including major telecom equipment manufacturers & operators:

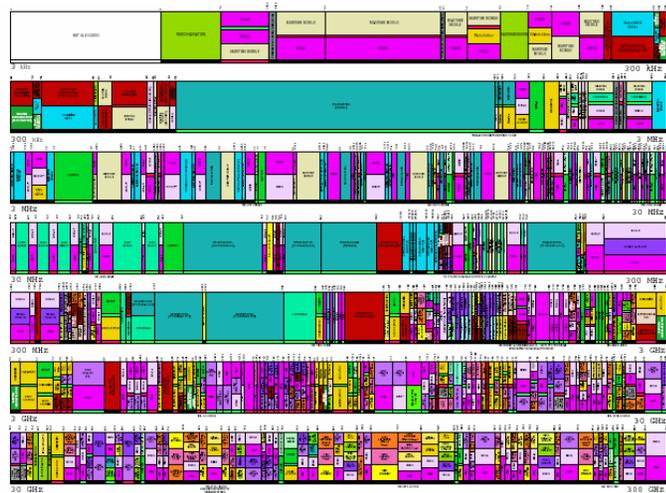
- AT&T, British Telecom, France Telecom, Deutsche Telecom, PCCW, Reliance, Qwest, Sprint, Telenor
- Alcatel, Huawei, LG, Motorola, Nokia, Nortel, Samsung, Siemens, ZTE

With the ratification of the IEEE 802.16e standard, industry is rapidly gaining forward momentum

Spectrum Scarcity



FCC Spectrum Allocations (3KHz – 300GHz)



...And it's all spoken for (spectrum is a scarce resource)!

Problems

Artificial spectrum scarcity

- Auctions reveal price disparities
- Disparities suggest artificial scarcity

Need more “flexibly” licensed and unlicensed spectrum

- >80% of 300 to 3000 MHz is “command & control”
- 155 MHz in Cellular, PCS & SMR
- 83.5 MHz at 2.4 GHz

Rigidities lock in less valuable

- Uses
- Technologies

Intel's Approach

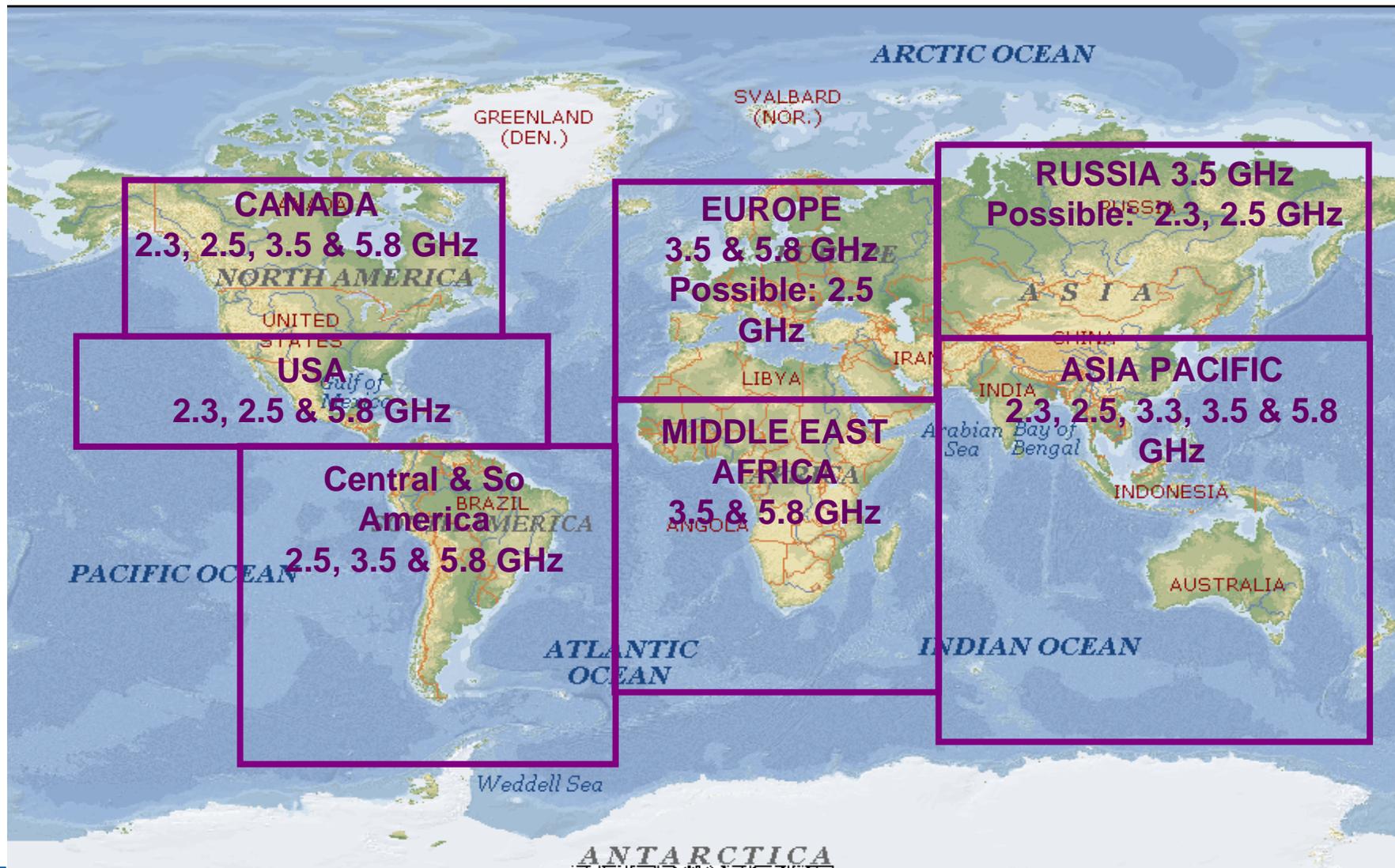
Public Interest Rationale

- Most valuable use
- Tech mandates risk becoming obsolete
- Fixed, Nomadic and Mobile services are converging
- Many radios on a single chip

Pragmatic Rationale

- Compelling rationale
- Cost effective
 - Global story
 - No need for cost-benefit analyses
- Long run perspective

WiMAX "Spectrum" by Region



Call To Action for Regulators

More "flexible" Spectrum For broadband wireless

- 3.5 GHz Band – fixed & nomadic services
 - Explicitly allow Nomadic use in Fixed Wireless spectrum - more consumer choices i.e. modems and laptops
 - Larger block sizes for new allocations
- 2.3 GHz Band – fixed not just mobile
- 2.5 GHz Band – mobile services
 - Promote new Technologies – such as 802.16 – to be allowed
- <1 GHz Band- Highly desirable for developing nations
 - Work to re-claim spectrum from digital transition
 - Not just broadcasting

Adopt Technology Neutrality - Support at ITU

Objections to Tech Neutrality at 2.5 GHz

- **Interoperability**
 - 5 standards already
 - Markets create interoperability
 - Markets reduce costs
- **Protectionism**
 - Auctions
 - Generally positive, but...
 - UK—strongly supports tech neutrality
 - ITU-R
 - Developing Countries

European 3G Mobile Auction Revenues

(Euros per capita)

2000		2001	
Austria	100	Belgium	45
Germany	615	Denmark	95
Italy	240	Greece	45
Netherlands	170		
Switzerland	20		
United Kingdom	650		

Paul Klemperer, Auctions: Theory and Practice, p. 152 (2004)



Summary

Wireless broadband is the battleground

Governments and the academy need to focus here

Inch by inch...

