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# WiMAX EAST AFRICA 2009

## Frequency Resource for WiMAX

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## *Scope*

1. What frequencies should regulators allocate for WiMAX
2. What would be the most efficient methods of assigning these frequencies
3. Cellular Vs WiMAX; should mobility be allowed at 3.5 GHz



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# 1. FREQUENCY RESOURCE

# *Frequency Resource for WiMAX*

- 2.3-2.4 GHz
- 2.4-2.483 GHz. (ISM. Free band used for WiFi systems in many countries)
- 2.5 – 2.69 GHz
- 3.3 GHz
- 3.4 GHz
- 5.8 GHz ISM
- NLOS operation difficult in higher bands. Evident problem for mobility and thus not preferred



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# Major wireless systems

	Freq band	Channel b/width	No. of users per channel	Range
GSM/EDGE	0.9 GHz 1.8 GHz	200 KHz	2 to 8	30kms, often less
UMTS	2.1GHz	5 MHz	In order of 25	5 kms
WiFi	2.4 GHz 5.8 GHz	5 MHz	1 at any given instant	100 m
WiMAX	2.3 GHz 2.4 GHz 3.4GHz 3.5 GHz 5.8 GHz	3.5 MHz 7 MHz 10 MHz in some cases	Many, in order of 100	20 kms for outdoor CPE



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## **2. WHAT WOULD BE THE MOST EFFICIENT METHOD OF ASSIGNING WiMAX FREQUENCIES**



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# *Possible licensing and assignment methods*

- *First-Come-First-Served*
- *Comparative Evaluation (Beauty Contest)*
- *Lottery*
- *Market based mechanism*



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## *Best method to assign?*

- Ever increasing demands on spectrum
- Relatively low wired infrastructure within East Africa makes wireless rollout easier
- Emerging trends
  - *Convergence and its challenges*
  - *Technological challenges , e.g. software defined radios, ultra wideband technology (UWB). wireless Interoperability for Microwave Access (Wi-MaX)*



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# Best Practices

- Traditional methods for spectrum assignment and pricing no longer suitable
- Must now consider market / economic based methods for spectrum assignment and pricing



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### **3. Cellular vs WiMAX :**

*To allow or not to allow  
mobility in 3.5 GHz band*



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## *Advantages of (Mobile) WiMAX systems*

- WiMAX spectrum cheaper than 3G
- WiMax always all IP, not the case for 3G especially the earlier versions. However long term evolution of 3G also headed to all IP
- WiMAX a very open system. Many algorithms possible hence greater optimization and connections with different business units.
- WiMAX physical layer based on OFDM, which has a much higher spectrum efficiency



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## *Advantages of 3G cellular systems*

- 3G has field advance of 2-3 years than WiMAX.
  - Is that enough to give it predominance in the market place?
- 3G operates on lower frequencies, thus greater range than WiMAX
- Operates in protected bands; reduced risk of harmful interference from ISM applications



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## *To allow mobility in 3.5 GHz?*

The many algorithms of WiMAX could create interoperability problems, at least for the first few years

- Technologically its possible to do deploy mobility
- Mobility will not be permitted in the 3.5 GHz band since ITU studies have shown that mobile services are not compatible with Satellite services in this band



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# Thank you

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