WiMAX: Utilities’ Wireless Broadband Solution?

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Essential Elements for Wireless Technology Rollouts

- $$$
- Spectrum
- Technology
Essential Elements for Wireless Technology Rollouts

- Technology
  - Operationally stable, cost-effective deployment strategy for infrastructure and subscriber units.
  - Equipment/software chipmaker support

- Spectrum
  - Sufficient quantity, favorable propagation characteristics, global/regional allocation

- $$$
  - Sufficient resources to deploy, support, and market the service
Essential Elements for Wireless Technology Rollouts

Technology (cont’d)

- Not mired in patent/IP disputes
- IP licensing costs are moderate
- Open v. proprietary standards
- CPE: Open access or compatible devices controlled or defined by services provider
  - Ex.: EV-DO cards of Verizon and Sprint
Spectrum: Winners or Losers

Winners
- Broadband PCS
- 900 MHz MAS
- AWS
- 11 GHz Fixed
- WiFi at 2.4 GHz and 5.8 GHz
- 800 MHz and 900 MHz land mobile

Losers
- Narrowband PCS
- WCS 2.3 – 2.4 GHz
- LMDS
- 38 GHz Fixed

Jury’s Still Out
- BRS—2.5 GHz WiMAX
- 3.65 GHz
- 220 MHz
- 700 MHz
Utilities’ Wireless Broadband Challenge: No Private Allocation

- Growing wireless broadband apps
- Potential wireless broadband spectrum
  - Licensed spectrum held by auction winners, commercial providers, educational institutions or combinations thereof
    - Secondary markets have not yet developed
  - Unlicensed spectrum is unlicensed
- Potential hybrid at 700 MHz
Utilities’ Wireless Broadband Challenge: The Private Mindset

• No private broadband allocation = No wireless broadband = No progress

• Need to distinguish
  ➢ Essential appls
    ▪ Grid management and control
    ▪ Emergency response

• From potential applications and redundancy benefits
Wireless Broadband Technologies—IEEE Standards

- Personal Area Networks ("PAN")
  - IEEE Standard 802.15
    - Bluetooth
    - Up to 10’
- WiFi ("Wireless Fidelity") ("LAN")
  - IEEE Standard 802.11
- WiMax ("Worldwide Interoperability for Microwave Access") ("MAN")
  - IEEE Standard 802.16
WiFi and WiMAX at a Glance

• WiFi
  • IEEE Standard 802.11
    ➢ Multiple versions
  • Broadband “Hotspots”
    ➢ Limited range (<300’)
  • Unlicensed spectrum

• WiMAX
  • IEEE Standard 802.16_
  • Substitute for DS-1
    ➢ 5 km - 30 km
  • Broadband “Hot Zones”
    ➢ Several kilometers
  • Licensed and unlicensed spectrum
WiMAX Frequency Bands

• 2.5 GHz (licensed spectrum in USA)
  ➢ Assigned or auctioned in USA
    ▪ Broadband Radio Service
      - Primary Licensees: Sprint & Clearwire
    ▪ Education Broadband Service (Formerly ITFS)

• 3.5 GHz
  ➢ 3.65 GHz is “closest” US allocation
  ➢ Hybrid licensing scheme implemented by FCC

• 5.8 GHz (Unlicensed spectrum in USA)
• Other Potential Bands
  ➢ 4.9 GHz
  ➢ 700 MHz
WiMAX v. Other Wireless Broadband Technologies

• WiMax Benefits
  ➢ Open standard
  ➢ Multimedia QoS, not only contention-based
  ➢ Many more users
  ➢ Substantially higher data rates
  ➢ Greater coverage areas
  ➢ More capacity v. existing BWA systems
    ▪ Ex. Verizon Wireless’ and Sprint’s EV-D0
      - 256 kbps to 700 kbps
      - Derived from cellular and PCS bands
      - Bandwidth constrained
WiMAX Challenges

• Sprint-Clearwire
  ➢ Largest owners of 2.5 GHz spectrum
  ➢ Just beginning to roll out service
  ➢ Finances are challenged
    ▪ 3rd party investments from cable and Intel?

• Will WiMAX emerge at 700 MHz?
• Emerging Wireless Broadband Technology
  ➢ LTE
    ▪ Endorsed by Ericsson, AT&T Wireless and Verizon Wireless
WiMAX and Utilities

• Will WiMAX thrive?
  ➢ Will the ecosystem be built?
  ➢ Will WiMAX overcome or co-exist with dominant carriers’ commitment to proprietary networks?
• Will QOS and form of priority access evolve to allow utilities to deploy WiMAX beyond basic business applications and redundancy needs?
• Will secondary markets for 2.5 GHz spectrum develop? Will it matter?
Thank You!