

Issue Overview

- **Significant bandwidth is required to offer competitive services when considering data, voice, and video**
 - Competitive IPTV or video must support a sufficient channel line up
- **Reuse of frequencies reduces capacity**
 - Co-channel interference from own network
 - Co-channel interference from other networks
 - Interference increases SNR or C/I ratio required
 - Real world environment produces interference or noise across all bands

Throughput Estimates

- **Throughput requirements derived from Open Range business model assumptions on services offered, penetration rates, HH densities, estimated retransmission rates, estimated packet size inefficiencies, assumptions of IPTV/video throughput requirements with H.264 compression/MPEG4**
- **Throughput available derived from Nortel aggregate capacities**
 - **2x2 MIMO BTS/2x1 MIMO CPE**
 - **5 MHz channel**
 - N=1, 25 Mbps; N=3, 50 Mbps
 - **10 MHz channel**
 - N=1, 50 Mbps; N=3, 100 Mbps
 - **4x4 MIMO BTS/4x2 MIMO CPE**
 - **5 MHz channel**
 - N=1, 50 Mbps; N=3, 100 Mbps
 - **10 MHz channel**
 - N=1, 100 Mbps; N=3, 200 Mbps

Throughput Requirements

- **2x2 MIMO, N=1, 5 MHz channels provide insufficient throughput for data and voice only services for maximum penetration in business model**
- **Initial starting point for IPTV/video distribution consideration must be 2x2 MIMO, N=3, 10 MHz channels for competitive, commercially interesting service**
 - **Up to 28 standard definition or 10 high def streams per base station with 30 MHz of spectrum required at each base station**
- **More flexible, competitive commercial IPTV service would depend heavily on development and deployment of 4x4 MIMO base stations and 4x2 CPE in 2008**
- **Co-channel interference in deployed environment will require availability of additional channels for frequency planning**

For a competitive service, access to the full 50 MHz is required

Rural Definitions

- **Rural RSA/MSA geographies**
- **FCC Rural – counties with less than 100 HH per square mile of density**
- **Rural RUS – an Eligible Rural Community is defined in the RE Act as any area of the United States that is not contained in an incorporated city or town with a population in excess of 20,000 inhabitants (7 CFR 1738.2, as amended).**