

# Spectrum Policy and Recommendations

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# Latin America challenges

- No spectrum made available for advanced mobile broadband services
- Governments are promoting new entrants by using spectrum caps
- High taxes for wireless services and equipment
- No spectrum auction for 4G; likely bands are 2,5 GHz, 1.7/2.1 GHz and 700 MHz
- Low broadband penetration (less than 10%)

# Mobility Matters

**Mobile Communications = Reach and Cost-Effectiveness**

*[near 5 billion wireless subscribers world wide, with huge economic impact]*

**Broadband Communications = Game-Changing Capability**

*[high-speed services facilitates education, health care, public safety, basic government services, and individual productivity]*

**Mobile Broadband = The Next Iconic Technology**

*[may be huge, combining best of both mobile and broadband]*

# The Benefits of Mobile Broadband

- For emerging economies: US \$300 to \$400 billion and 10 to 14 million jobs
- For Latin America: \$US 50 to \$70 billion and an additional 1.1 to 1.7 million jobs (McKinsey 2009)
- A joint effort of the private sector and government needed to increase broadband penetration

# Global Trends: More Use, Bigger Bands

- 15 minutes watching YouTube = 1,000 minutes voice communications (both consume 100 MB) (Rysavy 2009)



- Monthly use, including smart phones and laptops, could rise from 1 GB in 2009 to 14 GB in 2015. (Cisco 2009)

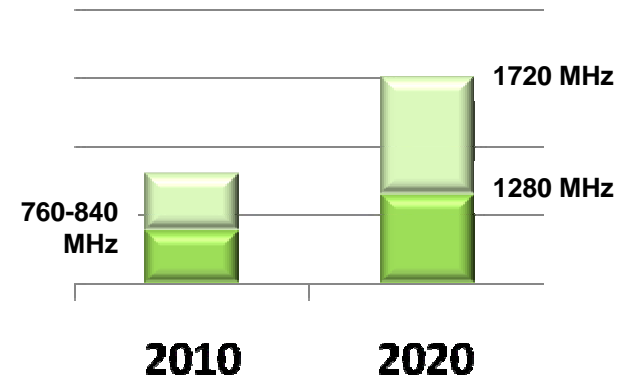
- An average subscriber could consume:

- 55 MB with email (per month)
- 200 MB with web browsing
- 2.7 GB with Internet radio
- 9 GB with video
- 27 GB with HD movie downloads (Rysavy 2008)



# Spectrum is a Critical Input: ITU Estimates of Spectrum Needs\*

- By 2010: between 760 and 840 MHz
- By 2020: between 1280 and 1720 MHz
- These numbers do not account for multiple providers. If three providers, the estimated need in 2020 increases by 280 MHz
- The conservative estimate for next year's need is three times greater than the average allocation in Latin America



\* ITU-R M.2078 report

# Options for Network Operators

- Charge more for peak-hour transmission
- Encourage use of femtocells by subscribers
- Build more cell sites
- Employ new technologies (HSPA+, LTE)
- Use more spectrum (however....)

# Why Not Have General Spectrum Aggregation Limits?

- Very difficult for policymakers to pick the optimal number of players in a market and they may promote inefficient entry
- Limiting spectrum held by incumbents means they must trade off between 2G/3G and advanced services
- If voice service is diminished, operators risk losing a main source of business and their ability to invest in future
- If advanced service is diminished, less adoption and opportunities to improve ARPU (Average Revenue Per User)



## Measuring the Effects: The Model

- A bottom-up cost model for a hypothetical player that is spectrum constrained and interested in providing an advanced service (LTE)
- Estimates the cost of providing this service under different scenarios: 2x5 MHz, 2x10 MHz, 2x15 MHz and 2x20 MHz
- Assumes zero monopoly profits. Thus,  
high cost to provide service = high price to consumer  
low cost to provide service = low price to consumer

# Parameters of the Model

- Interest rate paid by the firm (based on USF cases)
- Geographic area (largest metro areas)
- Data subscribers (based on population, market share, wireless penetration, data penetration)
- Cell site costs (construction, installation, maintenance)
- Users per site for different spectrum allocations
- Capital expenses in years 0-1 and years 4-5
- Operator hits break-even by end of year 8

# Application and Results

- The model is applied to three countries:  
Argentina, Chile and Colombia
- We find that strict aggregation limits  $>$  higher costs
- We estimate that higher costs  $>$  higher prices

# Minimum Monthly Cost of LTE Service Under Different Spectrum Allocations

2x20 MHz	2x15 MHz	2x10 MHz	2x5 MHz
\$X	\$1.3X	\$2X	\$4X

- In general, across all markets studied, a decrease in spectrum available from 2x20 MHz to 2x10 MHz results in a doubling of the cost.
- A further decrease in the amount of spectrum from 2x10 MHz to 2x5 MHz doubles cost again.

# Alternatives to Spectrum Limits

## I. Set Asides

- Often accompanied by serious problems, such as
  - price distortions (winners paying less than market value)
  - collusion
- In the U.S., the 1995 PCS C-Block failure
- In Canada, the AWS auction, with no new entrant nationwide and with serious price distortions
- In Peru, 25 MHz were set-aside in the 1900 MHz band for a new provider in September 2008; it has been auctioned twice since with no winner

# Alternatives to Spectrum Limits

## II. Antitrust Policy

- Should be market-specific. The FCC approach: consider how a transaction will affect competition by defining relevant market, looking at market power of incumbents, analyze barriers to entry and potential competitors, analyze efficiencies
- Policymakers must balance potential for market power against potential for efficiency gains

# Alternatives to Spectrum Limits

## III. Auction-Specific Rules

- It is critical that policymakers recognize the needs of likely bidders. For ex., spectrum block sizes need to be sufficiently large for new services.
- Maybe limit number of blocks that may be acquired by any one bidder, keeping in mind the above point.
- Digital Britain Report provides a model: combine 2.6 GHz and 800 MHz (The Big Auction), with a 2x65 auction cap.

# Selected Spectrum Caps in Latin America

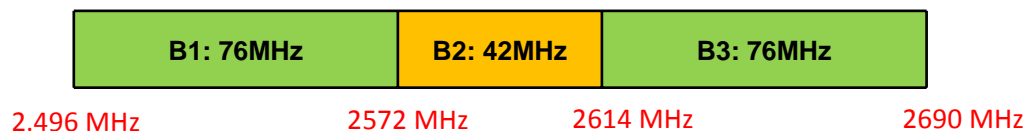
Country	Spectrum Cap, MHz	Comments
Argentina	50	Secom has announced it will license 1.7/2.1 GHz band in 2010?
Brazil	85	Increased from 50 to 85 for the end of 2007 3G spectrum auction. Planning auction structure of 2.6 GHz band based on public consultation comments received by Anatel
Chile	60	Two operators got 90 MHz; Nextel (60 MHz) and VTR (30 MHz). Planning structure of 700 MHz and/or 2.6 GHz band for LTE
Colombia	60	Incumbents excluded from 2.5 GHz 60 MHz auction that should take place by mid 2010
Mexico	80	Two simultaneous auctions: 30 MHz in 1900 MHz and 90 MHz in 1.7/2.1 GHz will take place most likely by mid 2010



## Update on 2.6 GHz band in Latin America

Country	Estimated auction	Comments
<b>Brazil</b>	<b>2012/13</b>	Anatel proposed to allocate 140MHz (2x70MHz) for mobile services. 2x60MHz would be assigned towards the end of 2012 and 2x10MHz in 2015. Local operadores plan to launch LTE before 2013.
<b>Chile</b>	<b>2010</b>	Subtel suggested to auction this band in 2010. Subtel has already channelized the 2.6GHz band based on ITU Option 1 (2 paired blocks of 76MHz and one block of 42MHz TDD).
<b>México</b>	<b>2010/11</b>	Cofetel and SCT evaluate the renewal of the license of Multivision MMDS operator as the whole band has been underutilized. Regulators estimate that they will get a big chunk of this band free to auction it in 2010 following ITU Option 1 recommendation.
<b>Colombia</b>	<b>2010</b>	MINTIC is auctioning 60 MHz in this band BUT has chosen option 3 of ITU recommendation and has established a new cap of 60 MHz to preclude incumbents of participating.

### Chilean plan for 2.6 GHz band (Resolutions 479/05 and 733/07):



# Summary

- Spectrum is a critical input for mobile services; demand far outstrips current supply.
- Lack of spectrum hinders new advanced services.
- Spectrum aggregation limits impose serious costs on existing providers, which are paid by consumers.
- In markets with constrained providers, consumers may pay twice as much for LTE if spectrum is limited to only 2x5 MHz as compared to 2x10 MHz, and four times as much as compared to 2x20 MHz.

# Obrigado!

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