

## **3G Licensing Overview**

**Regulatory Considerations:  
Understanding the Relationship between  
IMT-2000, IMT-Advanced and BWA**

# Agenda

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- **IMT-2000 (3G) Technologies and Spectrum Recommendations**
- **ITU-R World Radiocommunication Conference 2007 and IMT-Advanced**
- **Broadband Wireless Access (BWA) Activities at the ITU**
- **Licensing Considerations**
- **Recent 3G Licensing in South East Asia**
- **Conclusions & Recommendations**

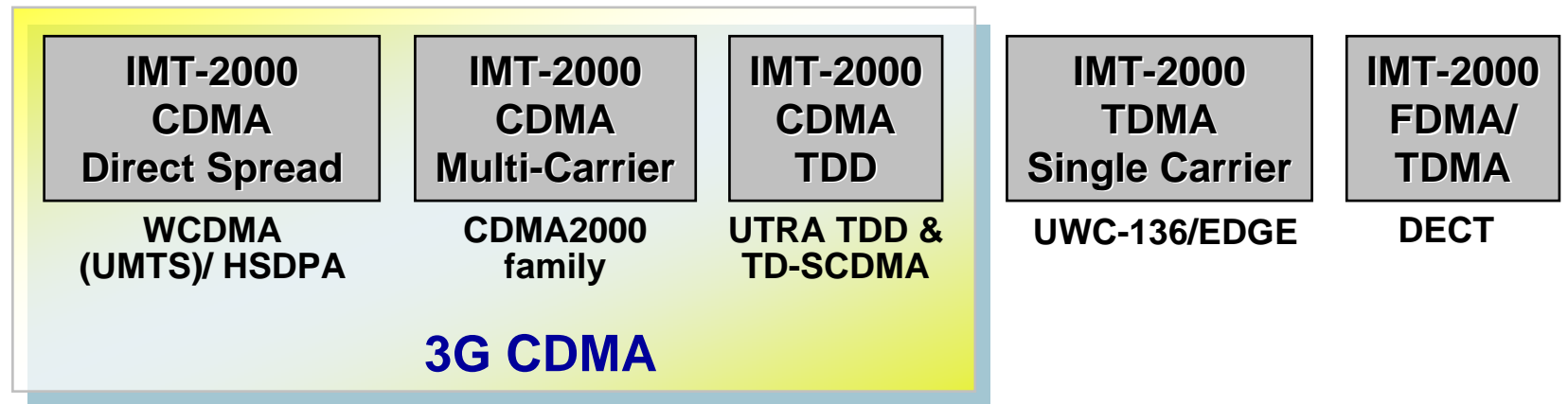
# **IMT-2000 (3G) Technologies and Spectrum Recommendations**

# IMT-2000 Radio Air Interfaces

The ITU approved five radio air interface standards and has identified multiple frequency bands for IMT-2000



## IMT-2000 Terrestrial Radio Interfaces



**WCDMA and CDMA2000 are the prevalent technologies deployed**

# IMT-2000 Spectrum – Identification by the ITU

The following frequency bands have been identified in the Radio Regulations (RR) (they have International Treaty status) as intended for use on a worldwide basis by administrations wishing to implement IMT-2000:

- WARC-92 identified the bands (RR No: 5.388)



- 1 885 - 2 025 MHz
- 2 110 - 2 200 MHz

- WRC-2000 identified the bands:

- 806 - 960 MHz (RR No: 5.317A)
- 1 710 - 1 885 MHz (RR No: 5.384A)
- 2 500 - 2 690 MHz (RR No: 5.384A)

- Identification of these bands does not establish priority in the RR and does not preclude use of the bands for any other services to which these bands are allocated.
- IMT-2000 systems may also be deployed in any frequency bands allocated to the mobile service.



# IMT-2000/3G Band: 806-960 MHz Band

Frequency arrangements	Mobile station transmitter (MHz)	Centre gap (1) (MHz)	Base station transmitter (MHz)	Duplex separation (2) (MHz)
<b>A1</b>	<b>824-849</b>	<b>20</b>	<b>869-894</b>	<b>45</b>
<b>A2</b>	<b>880-915</b>	<b>10</b>	<b>925-960</b>	<b>45</b>

NOTE 1 – Due to the overlap of base station transmitter and mobile station transmitter bands and the different usage of the bands 806-824 MHz, 849-869 MHz and 902-928 MHz between Regions, there is no common solution possible in the near- and medium-terms.

(1) *Centre gap* – the frequency separation between the upper edge of the lower band and the lower edge of the upper band in an FDD paired frequency arrangement.

(2) *Duplex band frequency separation* – the frequency separation between a reference point in the lower band and the corresponding point in the upper band of an FDD arrangement.

Source: Recommendation ITU-R M.1036-2, “Frequency arrangements for implementation of the terrestrial component of International Mobile Telecommunications-2000 (IMT-2000) in the bands 806 - 960 MHz , 1 710-2 025 MHz, 2 110 - 2 200 MHz and 2 500 - 2 690 MHz”



# IMT-2000/3G Bands: 1710 - 2200 MHz Band

Frequency arrangements	Mobile station transmitter (MHz)	Centre gap (1) (MHz)	Base station transmitter (MHz)	Duplex separation (2) (MHz)	Un-paired spectrum (e.g. for TDD) (MHz)
<b>B1</b>	<b>1920-1980</b>	<b>130</b>	<b>2110-2170</b>	<b>190</b>	<b>1880-1920; 2010-2025</b>
<b>B2</b>	<b>1710-1785</b>	<b>20</b>	<b>1805-1880</b>	<b>95</b>	
<b>B3</b>	<b>1850-1910</b>	<b>20</b>	<b>1930-1990</b>	<b>80</b>	<b>1910-1930</b>
<b>B4</b> (harmonized with B1 and B2)	<b>1710-1785</b>	<b>20</b>	<b>1805-1880</b>	<b>95</b>	<b>1900-1920</b>
	<b>1920-1980</b>	<b>130</b>	<b>2110-2170</b>	<b>190</b>	<b>2010-2025</b>
<b>B5</b> (harmonized with B3 and parts of B1 and B2)	<b>1850-1910</b>	<b>20</b>	<b>1930-1990</b>	<b>80</b>	<b>1910-1930</b>
	<b>1710-1755</b>	<b>50</b>	<b>1805-1850</b>	<b>95</b>	
	<b>1755-1805</b>	<b>305</b>	<b>2110-2160</b>	<b>355</b>	
<b>B6</b> (harmonized with B3 and parts of B1 and B2)	<b>1850-1910</b>	<b>20</b>	<b>1930-1990</b>	<b>80</b>	<b>1910-1930</b>
	<b>1710-1770</b>	<b>340</b>	<b>2110-2170</b>	<b>400</b>	

Source: Recommendation ITU-R M.1036-2, "Frequency arrangements for implementation of the terrestrial component of International Mobile Telecommunications-2000 (IMT-2000) in the bands 806 - 960 MHz , 1 710-2 025 MHz, 2 110 - 2 200 MHz and 2 500 - 2 690 MHz"

# IMT-2000/3G Band: 2500 – 2690 MHz



There are three scenarios of frequency arrangements for the terrestrial component of IMT-2000 within 2 500-2 690 MHz:

Frequency arrangement	Mobile station transmitter (MHz)	Centre gap (MHz)	Base station transmitter (MHz)	Duplex separation (MHz)	Center gap usage
<b>C1</b>	<b>2 500–2 570</b>	<b>50</b>	<b>2 620–2 690</b>	<b>120</b>	<b>TDD</b>
<b>C2</b>	<b>2 500–2 570</b>	<b>50</b>	<b>2 620–2 690</b>	<b>120</b>	<b>FDD DL (external)</b>
<b>C3</b>	<b>Flexible FDD/TDD</b>				

- **C1:** 2 x 70 MHz of paired spectrum (2 500-2 570 MHz and 2 620-2 690 MHz) with the duplex separation 120 MHz and central gap 2 570-2 620 MHz of unpaired spectrum. Center gap may be used for TDD applications.
- **C2:** Same as above but center gap may be used for FDD DL (external) applications.
- **C3:** Flexible choice between FDD and TDD within the whole band along with other variable technical parameters, such as FDD duplex separations and direction.

# **ITU-R World Radiocommunication Conference 2007 (WRC-07) and IMT-Advanced**



# ITU WRC-07 Relevant Agenda Items

- **Next ITU-R (Radiocommunications) World Radiocommunication Conference (WRC) is scheduled for October 2007**
  - The ITU-R Working Party 8F is responsible for the overall radio frequency spectrum and radio system aspects of IMT-2000 and systems beyond. It has the prime responsibility within ITU-R Study Group 8 for issues related to the terrestrial component of IMT-2000 and systems beyond; it works closely with Working Party 8D on issues related to the satellite component.
  
- **Identification of additional bands for IMT-2000 is Agenda Item 1.4 at the WRC**
  - **WRC-07 Agenda Item 1.4:** to consider frequency-related matters for the future development of IMT-2000 and systems beyond IMT-2000 taking into account the results of ITU-R studies in accordance with Resolution **228**;
  - Resolution 228 invites further studies of lower frequency bands for IMT-2000.
  
- **Review studies on sharing the 2500-2 690 MHz band by space services and IMT-2000 terrestrial services is Agenda Item 1.9 at the WRC**
  - **WRC-07 Agenda Item 1.9:** to review the technical, operational and regulatory provisions applicable to the use of the band 2 500-2 690 MHz by space services in order to facilitate sharing with current and future terrestrial services without placing undue constraint on the services to which the band is allocated

# Candidate New Frequency Bands for IMT-2000 and IMT-Advanced

- The ITU-R will rename “systems beyond IMT-2000” to be “IMT-Advanced”
- IMT is considered a root name that refers both IMT-2000 & IMT-Advanced
- The WRC-07 will decide whether any new frequency bands are identified for IMT-2000 & IMT-Advanced
- ITU estimates a spectrum need from 1.28 GHz to 1.72 GHz to support IMT-2000 and IMT-Advanced in year 2020
- Candidate frequency bands to be considered at WRC-07 include:
  - 410-430 MHz
  - 450-470 MHz
  - 470-806/862 MHz
  - 2300-2400 MHz
  - 2700-2900 MHz
  - 3400-4200 MHz and
  - 4400-5000 MHz.

## **IMT-Advanced Status: Defining 4G**

### **Next steps:**

- **Development of technical requirements and evaluation criteria**
- **ITU issues Circular Letter inviting proposals for IMT-Advanced**
- **Evaluation process**
- **Consensus building phase**
- **Systems under consideration could be both new radio air interfaces and evolved systems of IMT-2000 that meet requirements**

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# **BWA Activities at the ITU**

## ITU Recommendations on Broadband Wireless Access (BWA)

- ITU-R Working Party 8A (Land mobile service excluding IMT-2000) has developed a BWA recommendation: “Radio interface standards for broadband wireless access systems including mobile and nomadic applications, in the mobile service operating below 6 GHz”.
  - Notes some standards that can provide BWA - includes references to IMT-2000, IEEE 802.11, 802.16e, ETSI BRAN HIPERLAN, ARIB HiSWANa, ATIS WTSC wireless wideband internet access (WWINA) and Next-generation PHS
  - Unlike in the IMT-2000 family of standards (see slide 5), the ITU has not set up evaluation and testing methodology for the technologies outlined in this recommendation to ensure that technical requirements have been met. This recommendation simply **notes** systems that claim to provide BWA
  - **Does NOT associate standards with any frequency bands**

# ITU Recommendations on Broadband Wireless Access

ITU-R Working Party 9B (Fixed Service radio-frequency channel arrangements, radio system characteristics, etc) completed a report in July 2006 entitled, “Technical and operational characteristics and applications of broadband wireless access in the fixed service”

- Includes IMT-2000 as a BWA solution in fixed environments
- Provides characteristics of broadband wireless access (BWA) systems in the fixed service
- For use by Administrations/operators intending to deploy BWA systems in fixed environments
- Does NOT associate standards with any frequency bands

## Status of 2.5 GHz Sharing Studies at the ITU

- **2.5 GHz has been identified as an IMT-2000 band by the ITU and will be needed as capacity extension for IMT systems**
- **Studies are being conducted at the ITU to make sure that other systems do not cause interference to IMT-2000 systems and existing satellite systems in the band:**
  - **Premature to license systems other than IMT-2000 in this band before sharing studies have been completed**
- **Agenda Item 1.9 Sharing Studies:**
  - The ITU-R studies for the 2.5-2.69 GHz band consider terrestrial systems in the fixed service and in the mobile service (IMT-2000 systems). These studies also consider satellite systems in the FSS, MSS (including the satellite component of IMT-2000) and BSS
  - Decisions will be made at WRC-07 with respect to sharing in this band
- **WP8F Sharing Studies Ongoing at the ITU:**
  - Sharing studies in the 2 500-2 690 MHz band between IMT-2000 and fixed broadband wireless access (BWA) systems including nomadic applications in the same geographical area
  - Sharing studies in the 2 500-2 690 MHz band between IMT-2000 and mobile broadband wireless access (MBWA) systems in the same geographical area

# **Recent Licensing Considerations in South East Asia**

# Licensing Considerations

- **Coordination with ITU Radio Regulations is a Priority**
  - ITU plays an important role in planning- particularly spectrum management and harmonization
  - International cooperation and harmonization leads to economies of scale and successful technology adoption (i.e. IMT-2000)
  - ITU has not addressed the frequency bands that should be used for BWA type systems
  
- **Mobile BWA Technologies other than IMT-2000 Still Unproven in the Marketplace**
  - Lack of global spectrum harmonization
  - Still untested and in the early stages of wireless evolution for mobility (i.e. low battery life and high cost for PC cards)
  - Lack of economies of scale, lack of certified equipment availability
  - Technology performance (capacity and coverage) overestimated by 2-to-3x

## Licensing in Southeast Asia

- **Countries that have licensed spectrum at 2.3 GHz, 2.5 GHz and 3.4-3.6 GHz have done so on a technology neutral basis**
  - **Examples include Australia and Singapore**
  - **No uniform model in frequency band pairings (e.g. TDD and FDD, channel size), minimum data rates**
  - **These licenses have been mistakenly referred to in press as “WiMAX licenses”**
  
- **Licenses should be issued in a fair and unbiased manner**
  - **3G/IMT-2000 licensees should not be penalized by unfairly low fees for BWA licenses**
  - **Minimum criteria should not exclude qualified applicants**
  - **However applicants should show business case**

***Other than for IMT-2000 licensing, there is no convergence on licensing for BWA systems***

# **South East Asia Country by Country Information on 3G Licensing**

## 3G Licensing in South East Asia Region

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- **There are several license award methodologies used throughout the world**
  - Auctions
  - Comparative Evaluations (beauty contests)
  - Hybrid
  - “First Come, First Served” (direct award)
  - Lottery (this method has been used rarely)

# Licensing Methods

## First-come, First-served

### Pros:

- speed
- Inexpensive

### Cons:

- may not end up in hands of an entity that values it the most;
- value of license not taken into account;
- resellers instead of public may profit

# Licensing Methods

## Auctions

### Pros:

- speed
- may be less expensive than beauty contest,
- entity who places highest value on license wins,
- Spectrum is public resource so revenues benefit citizens,
- provide information about economic value of spectrum

### Cons:

- could lead to increased concentration in industry,
- may ignore non-financial public interest objectives
- revenue potential may create incentive for government to restrict output and raise prices

# Licensing Methods

## Beauty Contest

### Pros:

- awards license to contender who would best service public interest,
- allows for equity considerations,
- can require licensees to serve isolated areas

### Cons :

- time consuming,
- expensive,
- no rules for a “tie”,
- less transparent than other techniques,
- Allows government to determine what the market wants

# 3G Licensing in South East Asia Region

- **Asia: 3G Licenses**
  - The market is almost evenly split between beauty contests and auctions
  - Average license term is 10-15 years
  - Most license transferable with restrictions
  - Limited coverage and service launch obligations
  - Competition in the market is essential for affordable, quality and variety of services for consumers
    - At least three 3G licenses awarded per market which facilitates competition and benefits consumers

## 3G Licenses in Asia-Pacific

Country	Population	Award Process	Number of Licenses Available	Initial Fee (USD) per Licence	Number of Licenses Awarded	Initial License Term
<b>Australia</b>	19.4 M	Auction	6	\$4.6-96.4M	6	15 years
<b>Hong Kong</b>	7.2 M	Auction	4	Var. annual royalties	4	15 years
<b>Indonesia</b>	223.8 M	Auction	5	\$ 32.5-48 M	5	
<b>Japan</b>	126.8 M	Direct Award	none	none	3	none
<b>Rep. of Korea</b>	47.9 M	Beauty Contest and Fixed fee	3	\$1.1B	3	15 year
<b>Malaysia</b>	22.2 M	Beauty Contest and Fixed fee	4	\$13.2 M	4	15 years
<b>New Zealand</b>	3.9 M	Auction	4	\$10.3-16.7	4	20 year
<b>Philippines</b>	86.2 M	Beauty Contest	5	Per MHz Price	4	
<b>Singapore</b>	4.3 M	Beauty Contest and Auction	4	\$50 M	3	20 years
<b>Taiwan</b>	22.4 M	Auction	5	\$220-302M	5	16 years

## 3G Licensing in Australia

- **After 19 rounds of bidding in 2001, Australia's 3G mobile spectrum auctions closed with the six bidders agreeing to pay a total of \$1.17 billion (US\$580 million) for 48 of the 58 lots on offer.**
- **Former monopoly carrier Telstra achieved nationwide coverage by buying a combination of licenses for state capital cities and for rural areas.**
- **Australia's first 3G network, Hutchison Telecom's 3, was launched in April 2003. The launch of 3 was followed by Telstra Corporation's launch of Telstra Mobile Broadband, a CDMA2000 1xEV-DO service in October 2004.**
- **Currently Australia has four 3G providers, Telstra, H3GA, Vodafone and Optus.**
  - **Market competition is fierce with operators racing to roll out HSDPA.**

## 3G Licensing in Hong Kong

- Hong Kong's 3G licensing process in the 1.9/ 2.1 GHz band was completed in September of 2001, after over a year of public consultation and adjustments to license award plan.
- The Office of the Telecommunications Authority (OFTA), adopted a technology neutral approach and decided to allow operators to deploy any ITU-approved 3G technology within their assigned 3G spectrum.
- Key aspects of Hong Kong's 3G licensing process:
  - **Planned auction process** – OFTA developed a complex auction process with the goal to avoid collusion. Bidder information was not released. **4 bidders participated for 4 licenses, so licenses were awarded at their reserve price without the need for an auction.**
  - **Royalty-based fees** – Hong Kong's 3G license fees are calculated as a percentage of annual turnover with a required minimum annual payment. This allows licensees to spread out the cost of the licenses over time and provide the Government with an ongoing revenue stream.
  - **Open network access requirement** – Hong Kong's 3G licenses require that licensees make 30 percent of their network capacity available to mobile virtual network operators (MVNOs).
- New public consultation launched on allocating additional 3G license at 800 MHz for CDMA2000.

## 3G Licensing in India

- On September 27<sup>th</sup>, 2006, The Telecommunications Regulatory Authority of India (TRAI) issued its long awaited 3G recommendations
- TRAI has recommended an auction process for the **allocation of spectrum to 7 existing telecom operators for rollout of 3G services**
  - The recommendations targets a total of 2 x 32.5 MHz of spectrum for 3G services in **450 MHz, 800 MHz and 2100 MHz bands**.
  - TRAI views auctions with a **reserve price** as a transparent mechanism for allocating a scarce resource such as spectrum.
  - The transparent **auction process** suggested by TRAI would be **limited to the existing mobile operators** (Cellular & UASL), with roll out obligations.
- TRAI's 3G recommendations is one step towards 3G licensing and deployment in India. The next step is for the Department of Telecommunications (DoT) to approve TRAI's recommendations.
- This is another example of a government choosing to adopt a variety of frequency options as identified by the ITU for IMT-2000.

## 3G Licensing in Indonesia

- **Indonesia completed its 3G auction in January 2006. 3 licensees were each awarded 2 x 5 MHz of spectrum as follows:**
  - Telkomsel 1940-1945 MHz and 2130-2135 MHz; XL: 1945-1950 MHz and 2135-2140 MHz; Indosat 1950-1955 MHz and 2140-2145 MHz
- **In addition, 2 licensees were previously awarded spectrum in the 2003/2004 timeframe for a total of five 3G licensees:**
  - Cyber Access (CAC) 1920-1930 MHz and 2110-2120 MHz and Natrindo 1930-1940 MHz and 2120-2130 MHz
- **The process began with a public consultation to which 78 responses were received:**
  - DGPT decided to charge up-front fee and annual spectrum frequency fee
  - Spectrum fee based on market price through **auction** (winning bidder pays 2x what they bid for upfront fee and lowest winning bidder fee as annual fee)
- **3G operators were selected by:**
  - Registration, indicators and requirements such as roll-out commitments and auction process using two-sealed bid stages
- **Status:**
  1. Thus far, 2 out of 5 licensees have launched WCDMA – Telkomsel and Excelcom
  2. PT Indosat has received its operational license and will be launching WCDMA by the end of 2006.

## 3G Licensing in Macao

- **First phase of 3G beauty contest licensing**
  - 3 licenses for 8 yr terms- technical standards WCDMA and CDMA2000 1X EV-DO considered priorities and 1 license issued for each of these standards. 3rd license according to technology neutral principle among the rest of the proposals;
  - Spectrum considered:
    - FDD: 825 – 845 MHz / 870 – 890 MHz; 1710 – 1785 MHz / 1805 – 1880 MHz; 1920 – 1980 MHz / 2110 – 2170 MHz;
    - TDD: 1885 – 1920 MHz; 2010 – 2025 MHz.
- **Second phase of 3G licensing**
  - Gov't may issue the last license w/in 2 yrs after the issuance of licenses in 1st phase;
- On October 25th, 2006, the Macau Telecom Authority announced the 3G Licensees:
  1. 1EV-DO for Unicom Macao,
  2. WCDMA for CTM, Macao Fixed & GSM Operator,
  3. WCDMA for Hutchison Macao.
- This is another example of a government choosing to adopt a variety of frequency options as identified by the ITU for IMT-2000.

## 3G Licensing in Malaysia

- **Four operators in Malaysia are licensed to provide 3G.**
- **Background:**
  - In November 2001, the Minister of Telecommunications announced that **three spectrum blocks** would be made available for bids to be conducted via a **beauty contest, with each block being offered at a price of RM50 million (US\$13.3 million).**
  - The Application Information Package calling for proposals was issued in February 2002.
  - In March 2003, the MCMC awarded two blocks of spectrum to Telekom Malaysia (TM) Berhad and to UMTS (Malaysia) Sdn Bhd (Maxis).
  - **Two additional licenses awarded** to MiTV and TimeDotCom in 2006.
- **Status:**
  1. TM/Celcom launched HSDPA on June 15<sup>th</sup>, 2006
  2. Maxis launched HSDPA network in Sept 2006.
  3. TimeDotCom launched a UMTS/HSDPA trial in late 2006.
  4. MiTV awarded 3G network build out and plans to launch network in early 2007.

## 3G Licensing in New Zealand

- **Three 3G licenses were awarded via an auction**, yielding NZ\$133 million for the government.
- **A fourth license was set aside by the New Zealand government for the Maori population, who claimed the spectrum as part of their rights under settlement of historical grievances.**
- **Status:**
  1. Telecom New Zealand launched its 3G CDMA2000 EV-DO service in November 2004, offering users high-speed data services. Plans underway to launch EV-DO Rev. A in Dec. 2006.
  2. Vodafone New Zealand launched HSDPA in September 2006
  3. TelstraClear is scheduled to launch HSDPA in mid-2007.

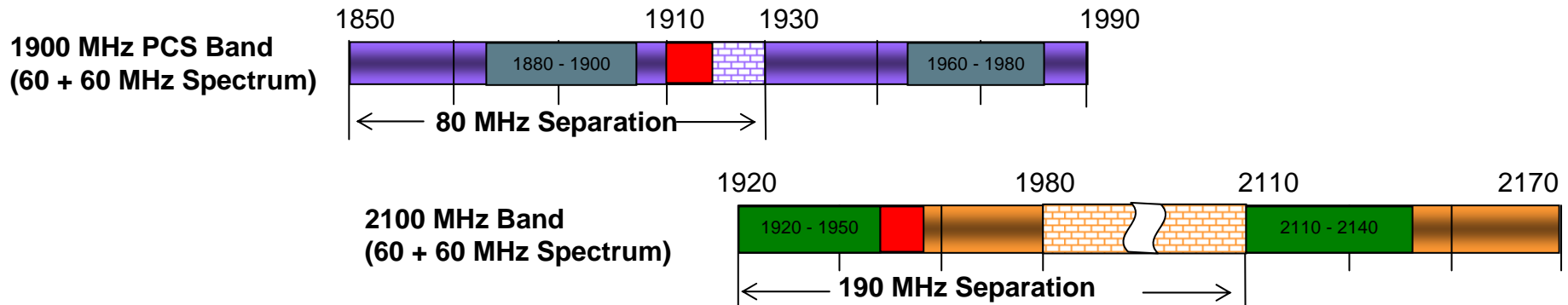
## 3G Licensing in Philippines

- **The NTC rules on 3G have allocated the following frequencies for 3G use:**
  - 825- 845 MHz, 870-890 MHz, 1880-1900 MHz, 2110-2170 MHz and 2010-2025 MHz
  - The 825-845 and 870-890 MHz frequency bands are currently assigned to existing mobile phone operators.
  
- **The NTC issued four 3G licenses to companies through a beauty contest approach – by evaluating their previous track records as telecommunications companies, alliances with overseas telecom companies and partnerships with 3G equipment vendors.**
  - Currently two companies, Smart and Globe offer WCDMA/HSDPA services
  - Digital Telecommunications (Digitel) and Connectivity Unlimited Resources Enterprises Inc. (Cure) also have licenses
  
- **Operators must provide 3G services to 80 percent of the Philippine towns and cities within 5 years, interconnecting with other telecom companies, and sharing networks with other telecom companies in areas that do not allow more than one 3G network.**
  
- **The NTC is an example of a government choosing to adopt a variety of frequency options as identified by the ITU for IMT-2000.**

## 3G Licensing in Singapore

- The government of Singapore initially **established a reserve price of S\$150 million** for each of the four 3G licenses.
- Prior to initiating the bidding process, **the government dropped the reserve price to S\$100 million** but received only three bids at the reserve price.
- **Singapore's StarHub, M1 and SingTel have robust WCDMA networks.**

# Current and Possible Future Spectrum Allocations in Pakistan



- Assuming a scenario of 10 + 10 MHz allocation to three operators
- Possibility of additional 5 + 5 MHz spectrum allocation

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# Conclusions & Recommendations

## Conclusions (1/2)

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- **3G licensing is nearly complete in the region**
  - **3G is stable, applications are increasing and costs are coming down**
  - **Best bet to affordably increase teledensity and Internet penetration is 3G**
  - **A minimum of three 3G licensees per market is recommended for healthy competition to bring greater benefits to consumers**

## Conclusions (2/2)

- **No uniform model for “BWA” licensing**
  - There is little international or regional cooperation
  - **ITU has not recommended specific frequency bands yet multiple bands are under consideration, leading to difficulties in roaming and achieving economies of scale**
    - Earliest possible identification of spectrum for BWA is at the ITU-R WRC-10
- **BWA technologies (other than IMT-2000) as defined in the new ITU-R WP8A Recommendation have not yet been vetted by the ITU**
- **It remains expected that the 2.5 GHz band will be used in much of the world for future developments of IMT-2000 and IMT-Advanced systems.**
- **Additionally, the ITU is still conducting sharing studies between IMT-2000 and non-IMT-2000 systems providing fixed and mobile access.**
- **Agenda Item 1.9 will also have the potential of impacting use of the band as it relates to mobile and satellite operations in this band.**
- **There are difficulties with regard to sharing issues with satellite and other systems particularly in 3.4 - 4.2 GHz bands**

# Recommendations to Regulators

- **Ensure most efficient use of scarce spectrum resources by maximizing use of proven commercial technologies.**
- **Best bet to affordably increase teledensity and Internet penetration is 3G**
- **Conduct public consultations prior to any licensing with regard to proposed criteria (e.g., assignment process, band plan, build out requirement, tender qualifications, number of licenses)**
- **Preserve the 2.5 GHz band for IMT-2000**
  - **Reserving 2.5 GHz for IMT-2000 preserves flexibility to choose preferred IMT-2000 technology**
  - **Globally harmonized band allows economies of scale in IMT-2000 handsets and infrastructure**
  - **Allocating spectrum to other BWA technologies in the 2.5 GHz band reduces value of a global IMT-2000 band**
- **Participate/follow discussions closely at ITU on IMT-2000, IMT-Advanced & BWA**

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**Thank You!**