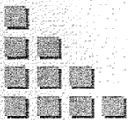




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# The National Communications Commission

Presented by  
Yun-Ti Yeh  
Section Chief,  
Resources and Technologies Department, NCC  
November 27, 2012



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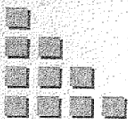


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## Outline

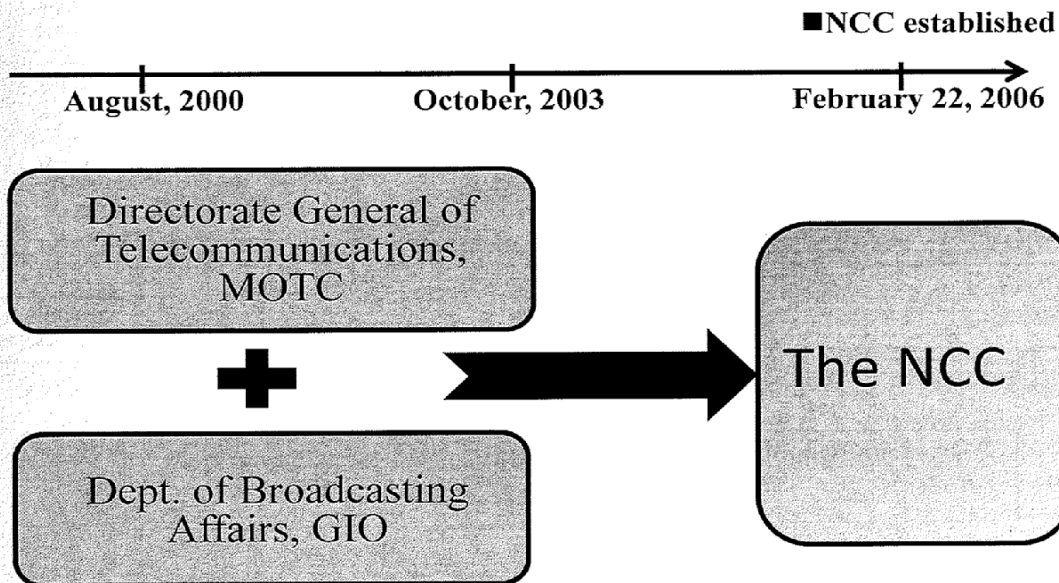


- **Introduction of the NCC**
  - History
  - Organization Chart
  - Missions
- **Spectrum Management**
  - Frequency Assignment Criteria
  - Licensing Regime
  - Spectrum Allocation
  - Unlicensed Band/ Short Range Devices
- **Next Step**





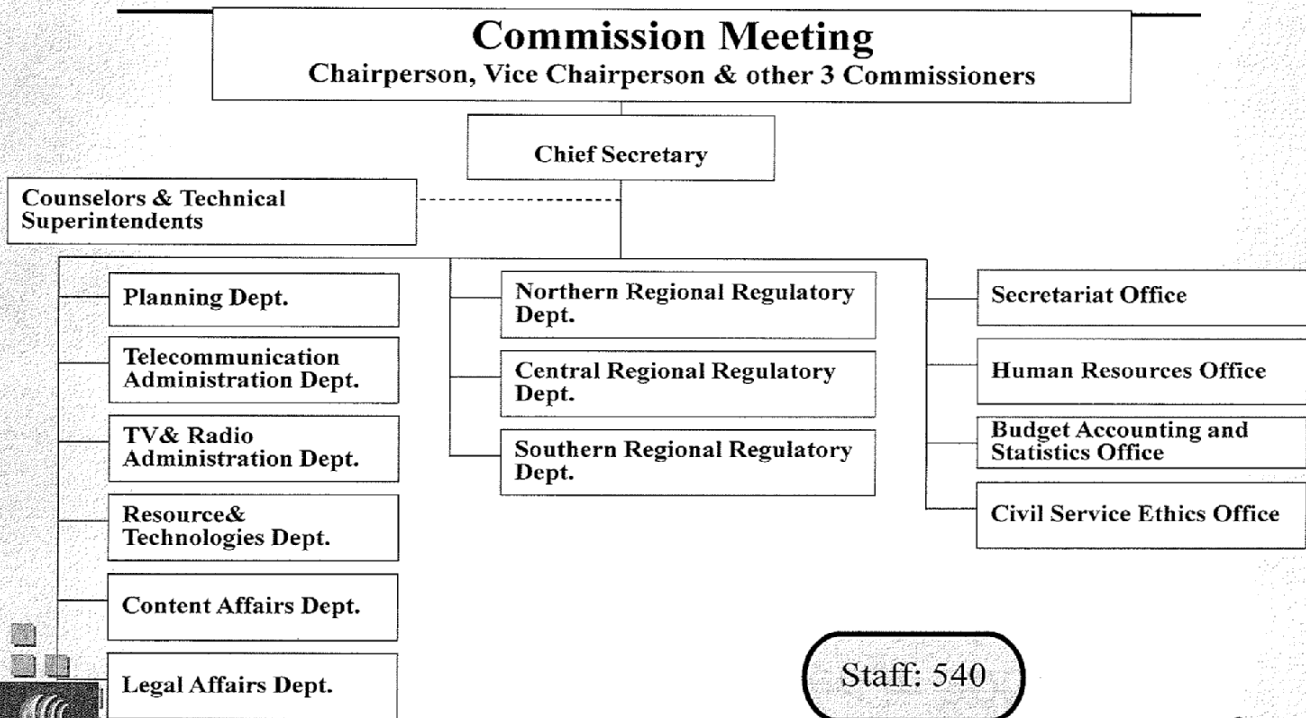
# The NCC was established in 2006 under the Fundamental Communications Act



2 2



# The NCC Organizational Structure



3 3



## The NCC Missions

- ◆ Chartered to be an independent regulatory agency, the NCC regulates the TV, radio, satellite broadcasting industries and the telecommunications industry in Taiwan
- ◆ Ensuring sound development of such industries
- ◆ Safeguarding fair competition in and across the above industries
- ◆ Protecting consumers' civil rights and interests
- ◆ Promoting multicultural diversity

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## Spectrum Management

under the Fundamental Communications Act

### **MOTC**

#### **Policy Maker**

- ◆ Policy-making of communication resources
- ◆ Spectrum allocation
- ◆ Planning the spectrum as a whole
- ◆ International coordination
- ◆ Table of Frequency Allocation

### **The NCC**

#### **Regulator**

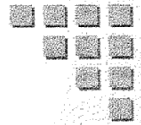
- ◆ Regulating communication resources (spectrum and telecom numbers)
- ◆ Licensing and frequency assignment
- ◆ Monitoring the illegal use of spectrum.
- ◆ Spectrum Fees Collection

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# Spectrum Management

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## Frequency Assignment Criteria

- ◆ **Comply with the international regulations and agreements**
  - ◆ ITU Radio Regulations and Final Acts of WRC
  - ◆ Region 3
  - ◆ Table of Frequency Allocation
- ◆ **Priority given to public services to maximize spectrum efficiency**
- ◆ **Public Safety and disaster warning systems are becoming critical issues**



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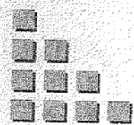


## Frequency Assignment Criteria

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- ◆ **Satisfy demand for spectrum from industry**
- ◆ **Retain spectrum for new technology and future expansion**



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## Licensing Regime for Public Telecom

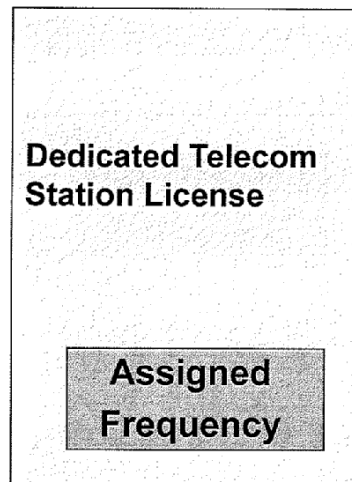


**Vertical Framework**

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## Licensing Regime for Dedicated Telecom



**Vertical Framework**

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## License vs. Assigned Frequency

- ◆ The service license can be issued by beauty contest or auction.
- ◆ Under Article 48 of Telecommunications Act, the public telecom and delectated telecom licenses (service and station licenses) are issued with the assigned radio frequencies.
- ◆ The frequencies are withdrawn once the service/station license is revoked.
- ◆ Neither a service/station license nor an assigned frequency is tradable, though mergers among licensees are allowed.
- ◆ Service licensee need to apply for station licenses before delivering services.

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## Licensing for Service License of Public Telecom

- ◆ Beauty contest
  - 2G licenses (900 & 1800 MHz)

Budget Law amended in 1998

Article 94: Unless otherwise provided for by law, grant of quota, frequency, or other limited or fixed amount special licenses shall be conducted by open auction or public invitation to tender.

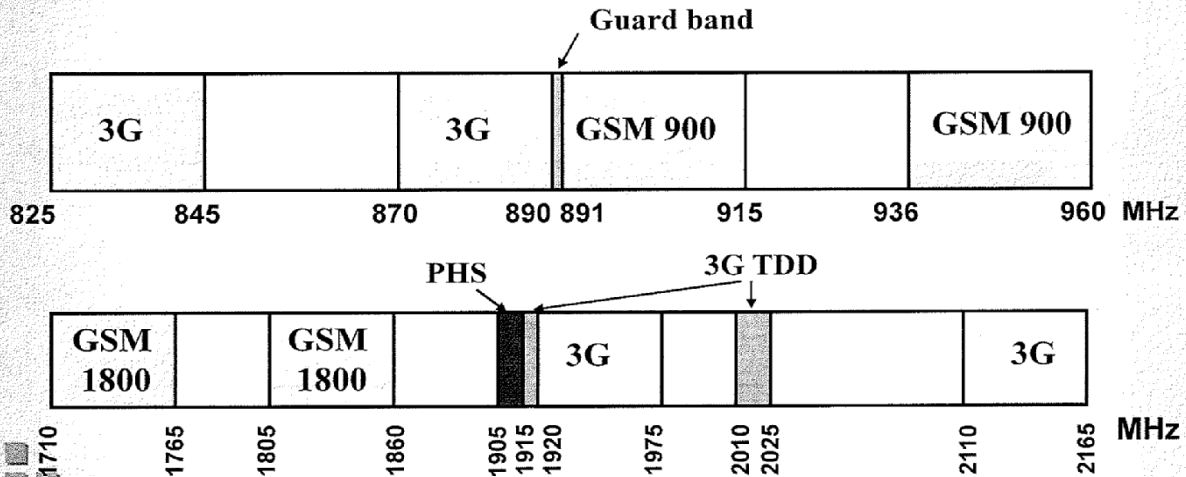
- ◆ Prequalification + Auction
  - 3G
  - 1900 MHz low power cordless telephone (PHS)
  - Broadband Wireless Access (BWA)

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## Spectrum Allocation for Mobile Communications Services

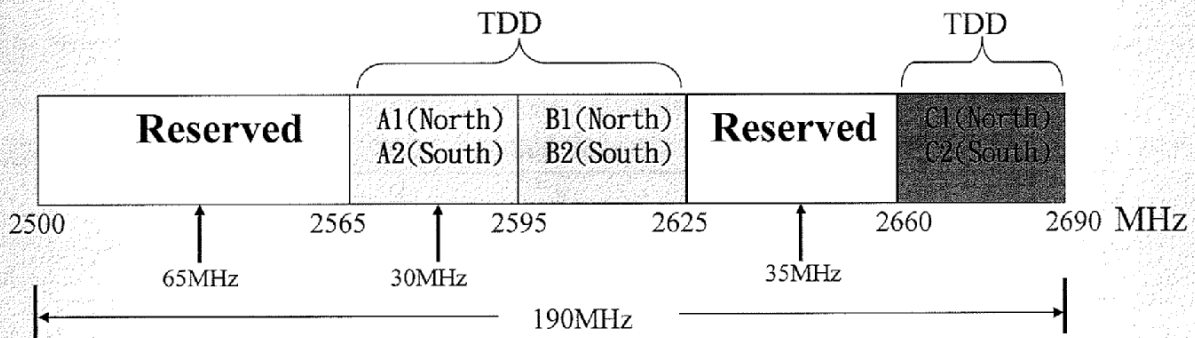
- ◆ GSM(900, 1800MHz)
- ◆ 1900 MHz low power cordless telephone (PHS)
- ◆ 3G



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## Spectrum Allocation for Broadband Wireless Access Service



- **Spectrum release in 2 stages**
  - 6 licenses awarded in July 2007
  - 100 MHz spectrum reserved

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# Spectrum Allocation for TV Broadcasting Service

Digital Transition Completed as of June 30 2012

5	6	7	8	9	10	11	12	
76-82	82-88	174-180	180-186	186-192	192-198	198-204	204-210	
24	25	26	27	28	29	30	31	32
530-536	536-542	542-548	548-554	554-560	560-566	566-572	572-578	578-584
33	34	35	36	37	38	39	40	41
584-590	590-596	596-602	602-608	608-614	614-620	620-626	626-632	632-638
42	43	44	45	46	47	48	49	50
638-644	644-650	650-656	656-662	662-668	668-674	674-680	680-686	686-692

51	52	53
692-698	698-704	704-710

Analog Channel: 5-12, 37-48, 50, 52 before Digital Transition

- For Fixed or Mobile
- For DTV
- For DTV
- For Mobile Communications or DTV
- For DAB



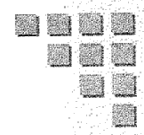
# Spectrum Allocation for Dedicated Telecom(1/2)

- ◆ For government and industry use
- ◆ 95% of total assigned frequencies (64,000) for fixed and mobile service in Dedicated Telecom
  - 3-76 MHz
  - 138-174 MHz
  - 380-450 MHz & 470-530 MHz



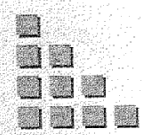


## Spectrum Allocation for Dedicated Telecom (2/2)



### ◆ 5% of total assigned frequencies in Dedicated Telecom

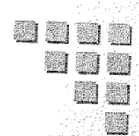
- Fixed or Mobile service (4.5G-5.0GHz)
- Comply with International Maritime Organization(IMO), e.g. Maritime Mobile Service (MM), Radionavigation Service (RV)
- Comply with International Civil Aviation Organization(ICA0), e.g. Aeronautical Radionavigation Service (RVA) , Aeronautical Mobile Service (MAA)
- amateur services comply with International Amateur Radio Union(IRAU)
- Radiolocation Service, Meteorological Aids Service,....



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## Unlicensed Band Short Range Devices (SRDs)



### ◆ WLAN

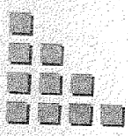
- 2.4 GHz band (2400-2483.5 MHz)
- 5.25 – 5.35 GHz : for U-NII indoor use
- 5.47 – 5.725 GHz & 5.725 – 5.825 GHz : for U-NII use

### ◆ RFID

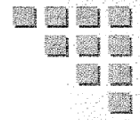
- 922 – 928 MHz: for RFID use

### ◆ Vehicle radar systems

- 76 – 77 GHz



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## Next Step(1/3) Future Demand for Spectrum

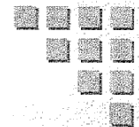
### ◆ Spectrum requirement : According to ITU-R Report M. 2078

Market setting	Spectrum requirement by the year 2020
High Market Setting	1720 MHz
Low Market Setting	1280 MHz

### ◆ According to ITU-R Report M. 2078, 1050MHz required by the year 2020 for mobile broadband use in our country ( source: Nomura Research Institute)

- ◆ 407MHz has, up to date, been assigned for the use of mobile communications and BWA services

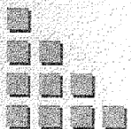
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## Next Step(2/3)

### To auction potential spectrum for Mobile Broadband Service in the end of 2013

- ◆ 700MHz (pursuant to APT band plan, 45MHzx2)
- ◆ 900MHz(30MHzx2)(2G renewal till June, 2017)
- ◆ 1800MHz(60MHzx2)(2G renewal till June, 2017)
- ◆ 270MHz for the mobile broadband service(4G)



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## Next Step(3/3)



### To introduce spectrum trading on the Mobile Broadband Service

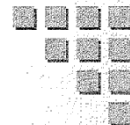
- ◆ 700MHz/900MHz/1800MHz
- ◆ Define spectrum usage right, rather than spectrum property right as trading object
- ◆ Spectrum cap- 1/3 of total spectrum for mobile broadband service
- ◆ Spectrum floor- 10MHz x 2



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## Questions(1/2)



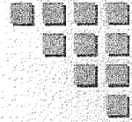
- ◆ In the Table of Frequency Allocation, What is the license needed and audited by NTIA for the Federal spectrum use? What law or act is defined in US law for this spectrum allocation and corresponding fees ?
- ◆ The US Frequency Allocation Chart and Table of Frequency Allocation was made by NTIA, rather than the FCC? Which law or act is defined in US to position the roles of those two organizations in spectrum management and audit/supervision?
- ◆ Do Federal users need licenses for their using Federal spectrum? Do they use microwave point-to-point spectrum as backhaul? If so, what rules should they need to comply such as transmission power or emission mask etc for interference concern ?
- ◆ One of IRAC's responsibilities is to maintain the spectrum database. Does it include the information related to the non-Federal spectrum? Is the database open to the public?



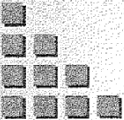
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## Questions(2/2)



- ◆ Does NTIA impose spectrum fees on Federal users?
- ◆ Is there any regulations and applications in place in FCC related to the new technology development like Software Defined Radio (SDR) or cognitive radio (CR) while licensed user may use other temporary unused licensed spectrum in CR technology?
- ◆ Do you think the incentive auction or secondary market can apply to Federal spectrum for license transfer, partitioning, disaggregation and spectrum lease when federal spectrum used becomes inefficient ?



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