# NØRTEL
## NETWORKS

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# Standardization of IMT-2000 and Systems Beyond

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**Session 6: Status and evolution of network access standards**
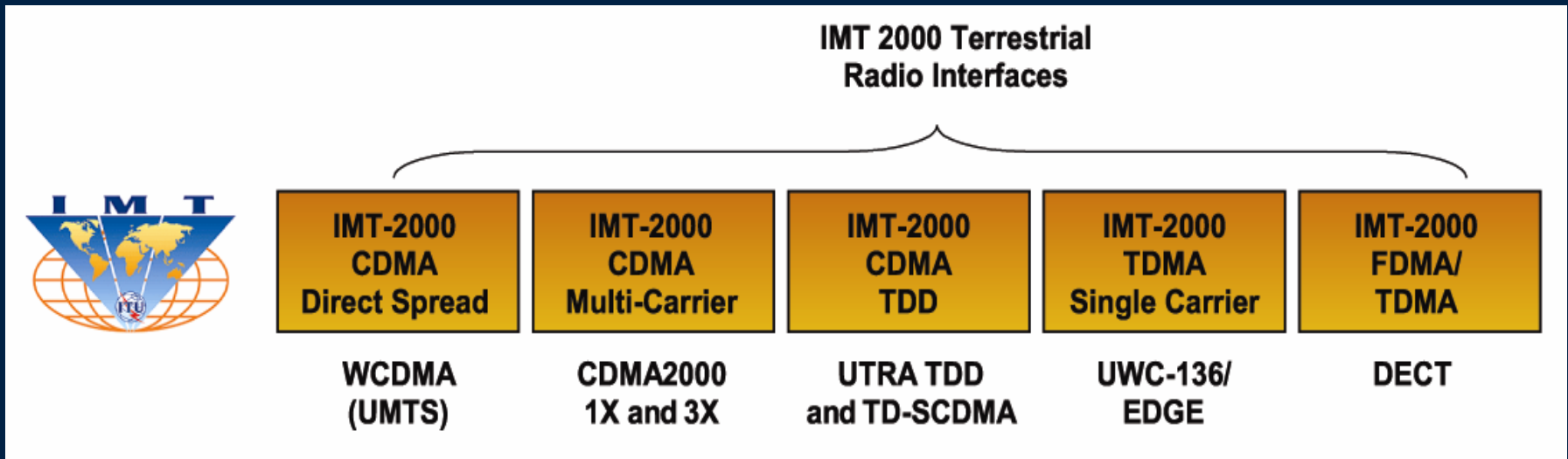**All Star Network Access Workshop, 2-4 June 2004, Geneva, Switzerland**

# Outline

- International Mobile Telecommunications -2000 (IMT-2000)
  - Evolving Capabilities
  - The five terrestrial radio access interfaces

- 3G Partnership Projects (3GPPs) and ITU Organization

- IMT-2000 coverage environments

- Future network of systems beyond IMT-2000 with a variety of access systems and framework for development

- Standards development and deployment timelines

- Summary

# Evolving Capabilities of IMT-2000 and Systems Beyond

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- Goal: anytime, anywhere, anyone – the deployment of IMT-2000 systems started in the year 2000

- IMT-2000 original minimum requirements for radio technology evaluation:
  - 144 kbit/s (for vehicular high speed),
  - 384 kbit/s (for medium speed), and
  - 2048 kbit/s (for indoor, low speed)

- Currently the standard supports up to 10 Mbit/s, further enhancements are being developed, possibly up to 30 Mbit/s by 2005.

- Research targets for systems beyond IMT-2000: 100 Mbit/s for high mobility and 1 Gbit/s for low mobility, for deployment after 2010.

# IMT-2000 Radio Access Interfaces



IMT 2000 Terrestrial Radio Interfaces

| IMT-2000 CDMA Direct Spread | IMT-2000 CDMA Multi-Carrier | IMT-2000 CDMA TDD | IMT-2000 TDMA Single Carrier | IMT-2000 FDMA/ TDMA |
|---|---|---|---|---|
| WCDMA (UMTS) | CDMA2000 1X and 3X | UTRA TDD and TD-SCDMA | UWC-136/ EDGE | DECT |

Reference: Recommendation ITU-R M.1457

- Standards driven by market, technology & regulatory opportunities

- The objective was accomplished by making extensive use of references to detailed information held by "external Recognized Organizations"

- Many of these standards are being enhanced

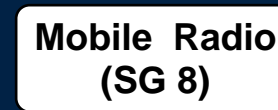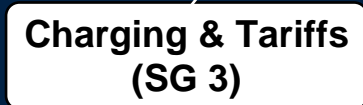# ITU and partners of the 3G Partnership Projects



Standards Development Organizations (SDOs)
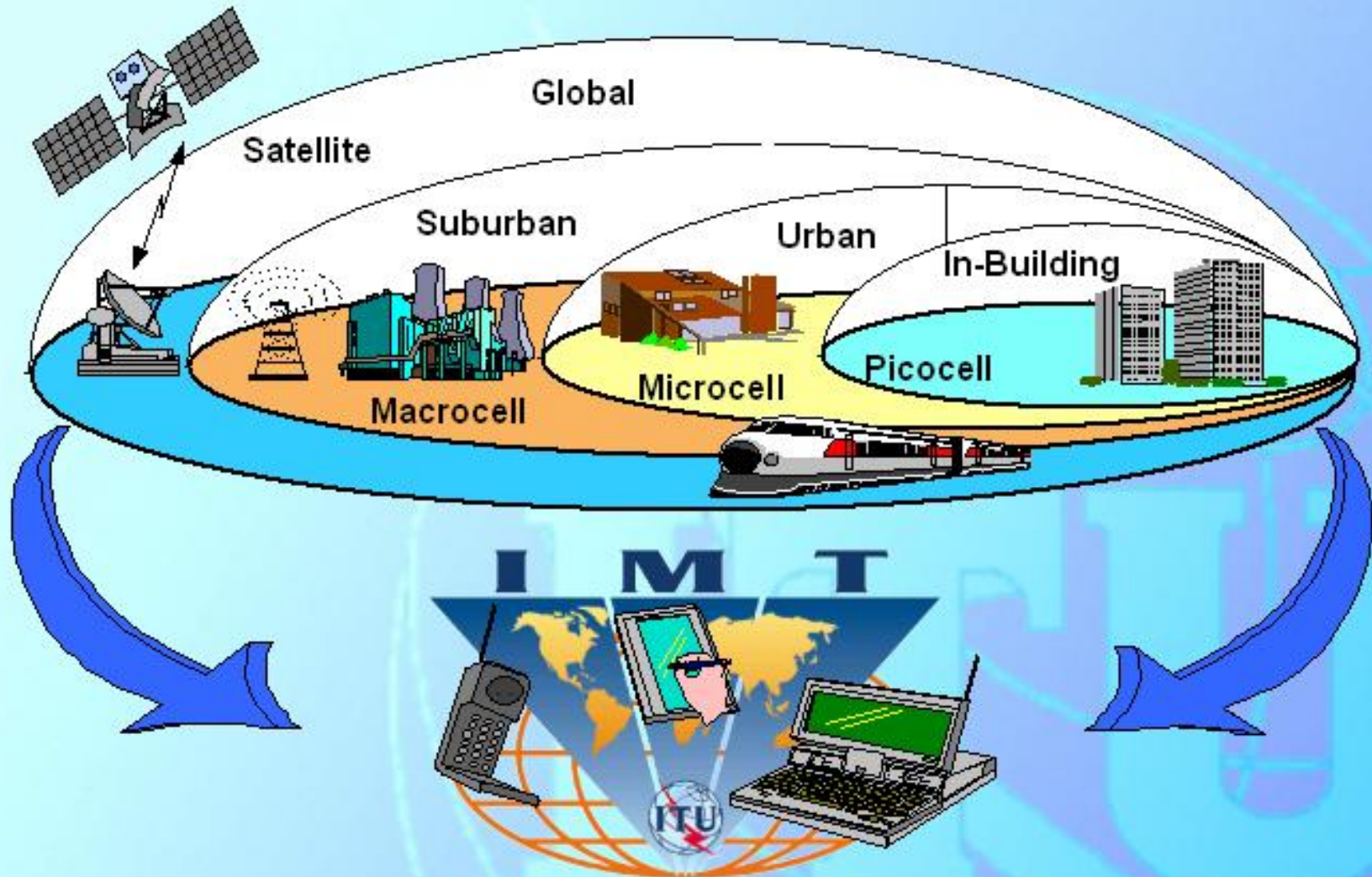
# ITU Study Group Organization related to IMT-2000

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**ITU**

**Telecommunication Standardization Sector**

**Radiocommunication Sector**

**ITU-T**

**ITU-R**

**Charging & Tariffs (SG 3)**

**IMT-2000 (SSG)**

Chair: John Visser
Nortel Networks

**Mobile Radio (SG 8)**

**Mobile Satellite (WP 8D)**

**IMT-2000 & beyond (WP 8F)**

Chair: Stephen Blust
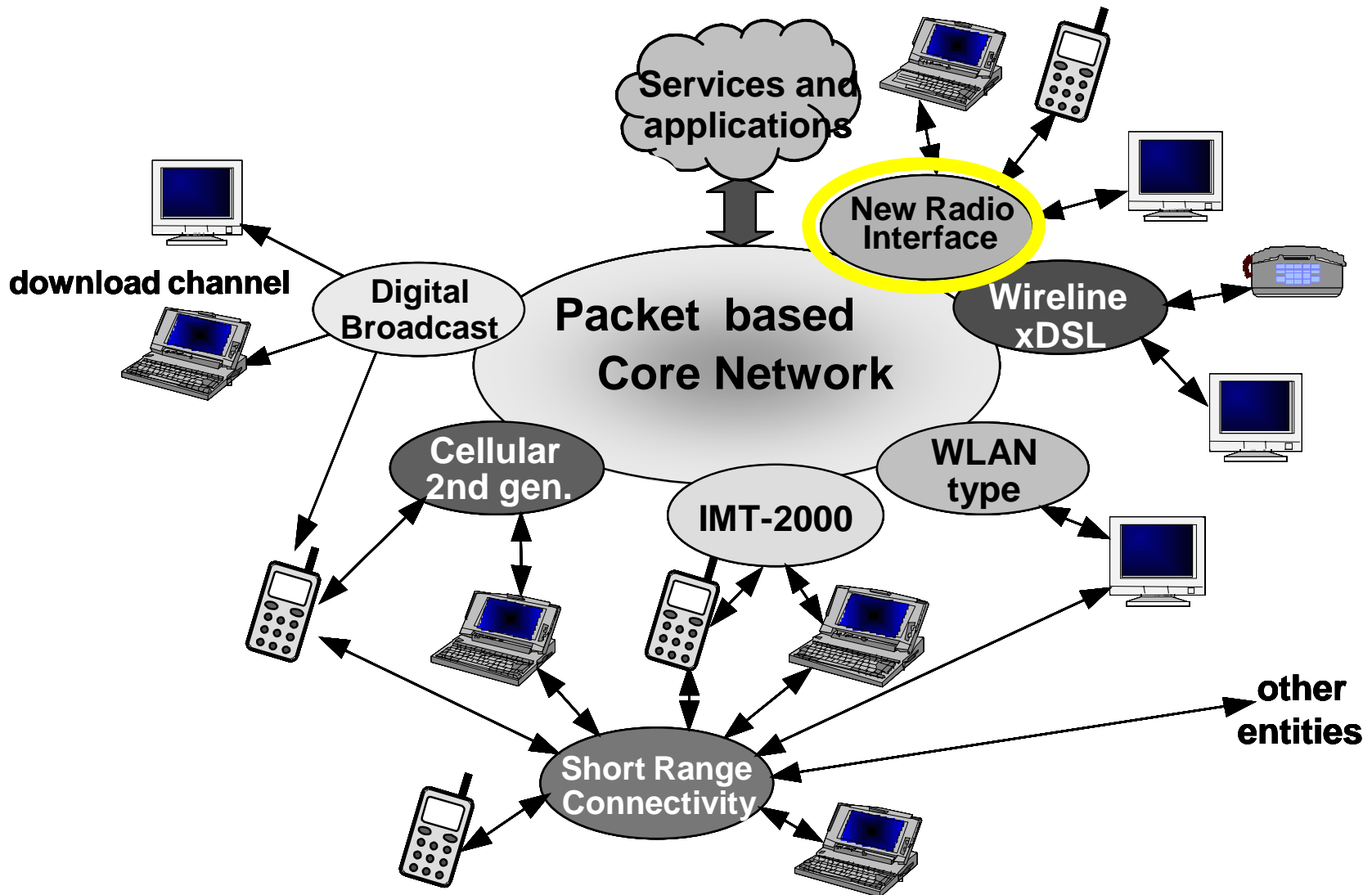Cingular Wireless

**WRC-07**

WRC-07   World Radiocommunication
         Conference in 2007
SG       Study Group
SSG      Special Study Group
WP       Working Party

# IMT-2000 Coverage Environments

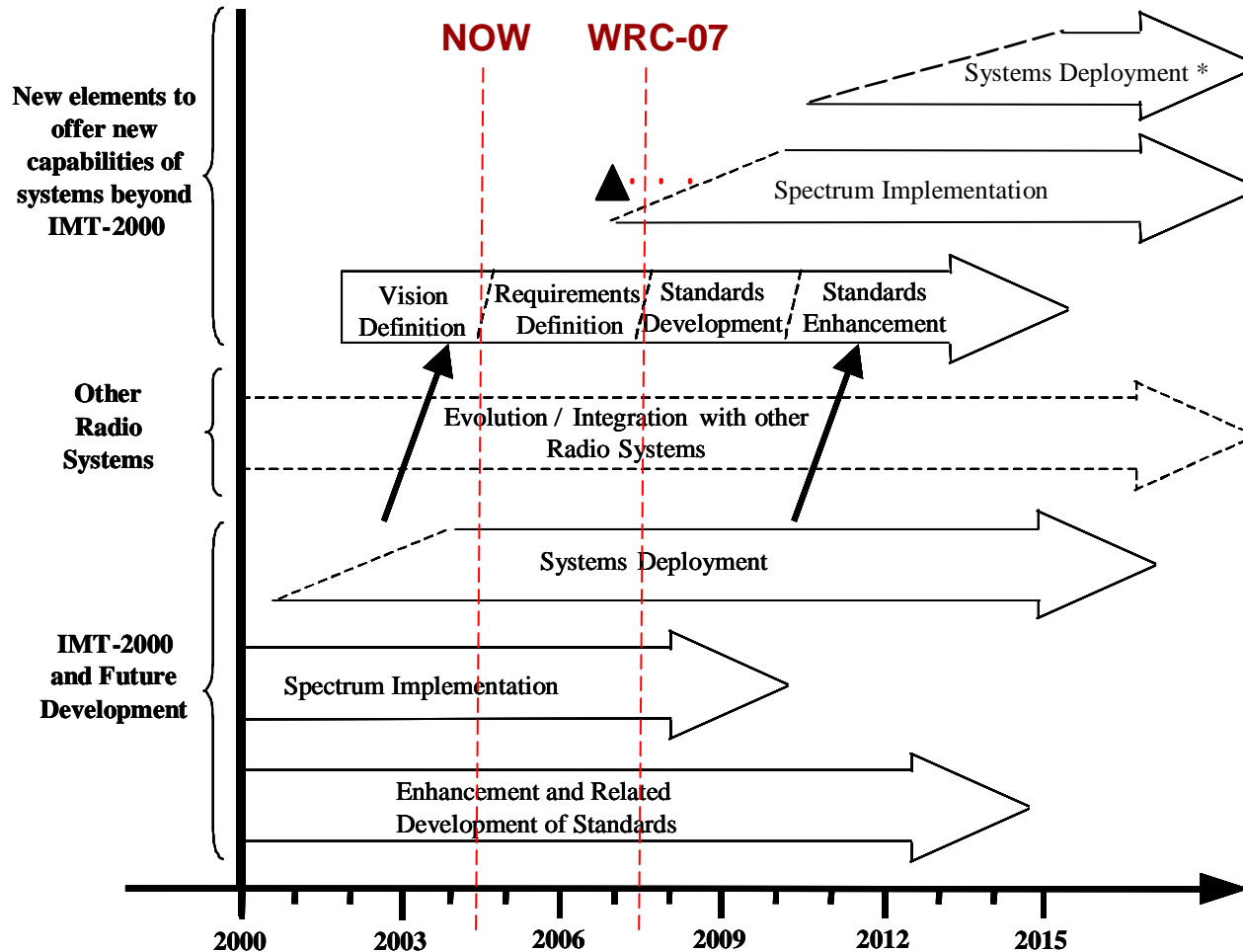# Future network of systems beyond IMT-2000 with a variety of access systems

Services and applications

New Radio Interface

download channel

Digital Broadcast

Packet based Core Network

Wireline xDSL

Cellular 2nd gen.

IMT-2000

WLAN type

Short Range Connectivity

other entities

# Framework for Development



Systems beyond IMT-2000 will encompass the capabilities of previous systems

New capabilities of systems beyond IMT-2000

Dashed line denotes that exact data rates not yet determined

Mobility

High

IMT -2000

Enhanced IMT -2000

New Mobile Access

Enhancement

New Nomadic / Local Area Wireless Access

Low

Peak useful data rate (Mbit/s)

1    10    100    1000

KEY: ⟷ Denotes interconnection between systems via networks, which allows flexible use in any environment without making users aware of constituent systems

Nomadic / Local area access systems

Digital broadcast systems

Reference: Recommendation ITU-R M.1645
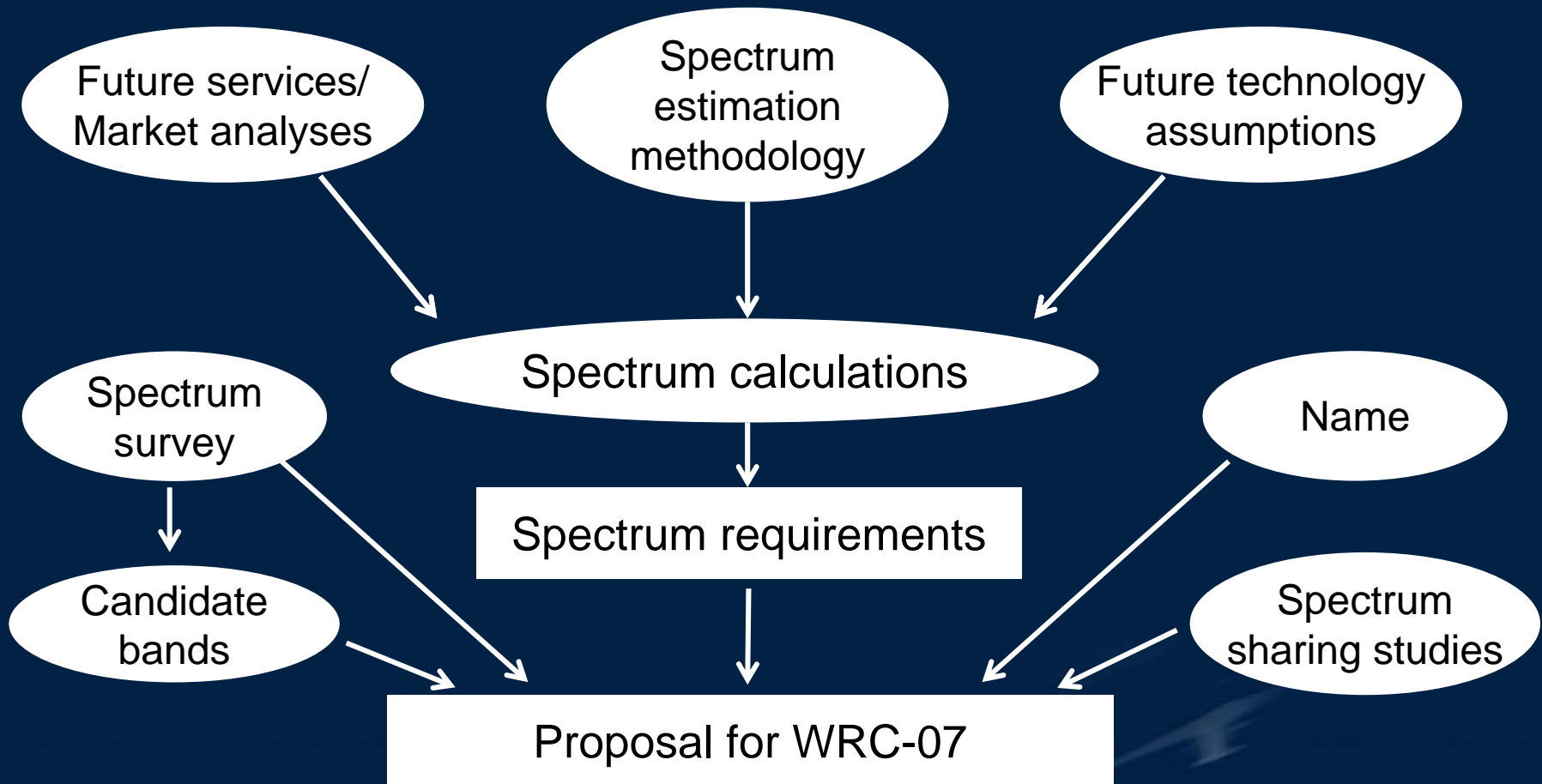
# Deployment & development timelines



The sloped dotted lines indicate that the exact starting point of the particular subject can not yet be fixed.

▲  : Expected spectrum identification at WRC07

*  : possible wide deployment around the year 2015 in some countries

# Systems beyond IMT-2000

**2007-2010: Development of standards for systems beyond IMT-2000**

# WP 8F Meeting Schedule

| Meeting Number # | Date | Location |
|---|---|---|
| 12 | 18-25 February 2004 | Busan, Korea |
| 13 | 16-23 June 2004 | Berlin, Germany |
| 14 | 13-20 October 2004 | Shanghai, China |
| 15 | 1-8 February 2005 | Geneva, Switzerland |
| 16 | 8-15 June 2005 | Quebec City, Canada |
| 17 | 12-19 October 2005 | [Finland] |
| 18 | 8-15 February 2006 | [Bangkok] |
| 19 | 17-24 May 2006 | [France] |
| 20 | [November / December 2006] | [to be determined] |

# Summary

- Flexibility is "designed in" from the outset.

- Enhancements already being standardised and will evolve considerably over next 10-15 years – open and market led.

- A partnership and coordinated process for standards development is proven (ITU, PPs, SDOs, Forums, etc.).

- Relationship with other radio systems to take place on a market led basis – regulatory considerations.

- New radio interface(s) will be required sometime between 2010-2015 – subject to market and spectrum considerations.

# References

- **ITU Radio Regulations, 2001**
  http://www.itu.int/ITU-R/publications/publication.asp?product=rr2001&lang=e

- **ITU World Radiocommunication Conference (WRC-03) Final Acts**
  http://www.itu.int/ITU-R/publications/acts/index.asp

- **Recommendation ITU-R M.1457, "Detailed specifications of the radio interfaces of IMT-2000", 2003.**
  http://www.itu.int/rec/recommendation.asp?type=folders&lang=e&parent=R-REC-M.1457

- **Recommendation ITU-R M.1645, "Framework and overall objectives of the future development of IMT-2000 and systems beyond IMT-2000", 2003.**
  http://www.itu.int/rec/recommendation.asp?type=folders&lang=e&parent=R-REC-M.1645

- **ITU Handbook on "Deployment of IMT-2000 Systems", 2003.**

  **Hardcopy:** http://www.itu.int/publibase/catalog/itupub.asp?Part=4.4

  **Softcopy:** http://www.itu.int/itudoc/gs/imt2000/84207.html

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