

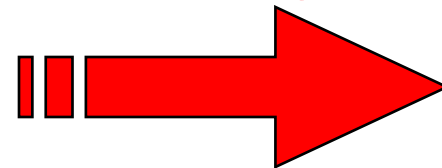
Mobile data Networks

Radio Access - Three Main Phases



New radio interface(s)
research target 100 – 1000 Mbit/s (full to low mobility)

i.e.

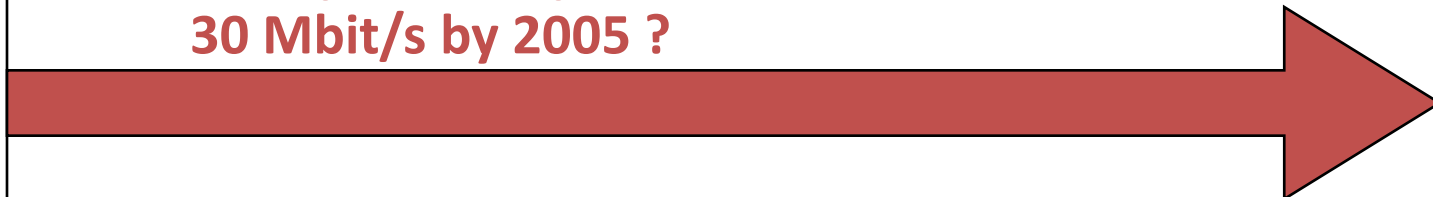


Relationship with other radio systems
Digital broadcast, RLAN, etc.

e.g.



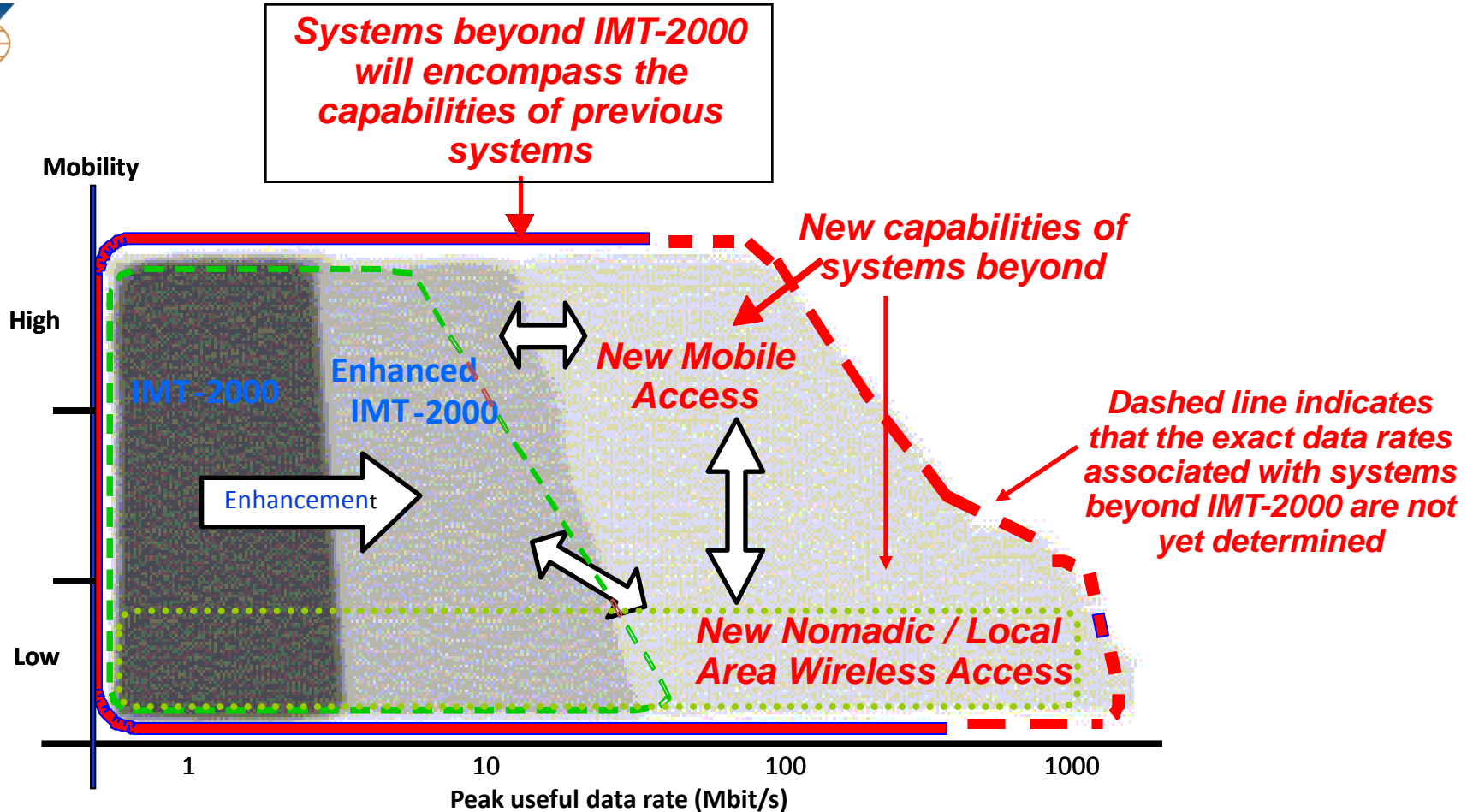
Enhancing IMT-2000 i.e.
“fast packet” up to 10 Mbit/s,
30 Mbit/s by 2005 ?



2001

2010

Framework for Development ('The Van')



Interconnection



Nomadic / Local Area Access Systems



Digital Broadcast Systems

Technology Trends

- Significant technology trends need to be considered in defining the framework and objectives for systems beyond IMT-2000
- R&D should consider these trends & provide guidance on their applicability or influence to systems beyond IMT-2000:
 - System-related technologies, example:
 - VoIP
 - Seamless mobility
 - Security & privacy
 - Access network & radio interface, including
 - Modulation and coding schemes
 - Multiple access schemes
 - Software defined radio & reconfigurable systems
 - Adaptive radio interface
 - New antenna concepts & technologies

Technology Trends

- **Trends continued:**
 - **Utilization of spectrum**
 - New techniques to increase spectrum utilization & efficiency, and to allow sharing of spectrum between users (ex. Adaptive antennas, MIMO, adaptive dynamic channel assignment)
 - **Mobile terminal, example technologies:**
 - Man-machine interfaces
 - Software defined radio & multi-mode terminals
 - RF MEMS
 - Battery technology
 - **Applications**
 - Speech & video streaming
 - APIs
 - Data coding & compression techniques

Spectrum

- **Need to plan use of spectrum already identified**
 - **Recommendation ITU-R M.1036**
806-960, 1710-2025, 2110-2200 and 2500-2690 MHz
 - **Including new methods for reuse and sharing of spectrum; and new technologies for efficient use of spectrum**
- **WRC-07 agenda item to address future requirements**
 - **Recommendation ITU-R M.1645**
 - **Resolution 802 (WRC-03)**
 - **Resolution 228 (Rev.WRC-03)**

Resolution 802 (WRC-03)

2007 World Radiocommunication Conference

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 (Rev.WRC-03)”

Resolution 228 (Rev.WRC-03)

resolves

- 1 to further study technical and operational issues ...;
- 2 to report to WRC-07 on the spectrum requirements and potential frequency ranges ...;
- 3 to conduct regulatory and technical studies on the usage of frequencies below those identified for IMT-2000 ...;
- 4 to take into consideration the particular needs of developing countries including use of the satellite component of IMT-2000 ...;
- 5 to include sharing and compatibility studies with services already having allocations in potential spectrum ...;
- 6 that WRC-07 should consider frequency-related matters for the future development of IMT-2000 and systems beyond IMT-2000 ...;

Spectrum Implications

- In analysing the spectrum implications of the future development of IMT-2000 and systems beyond IMT-2000, many issues must be addressed, including:

- Traffic projections & requirements
- Service & application requirements
- Spectrum efficiency
- Radio transmission characteristics
- Global roaming requirements & harmonized use of spectrum
- Technical solutions to facilitate global roaming
- Techniques of dynamic spectrum sharing
- Sharing and compatibility analysis
- Evolution of IMT-2000 systems

The Plan

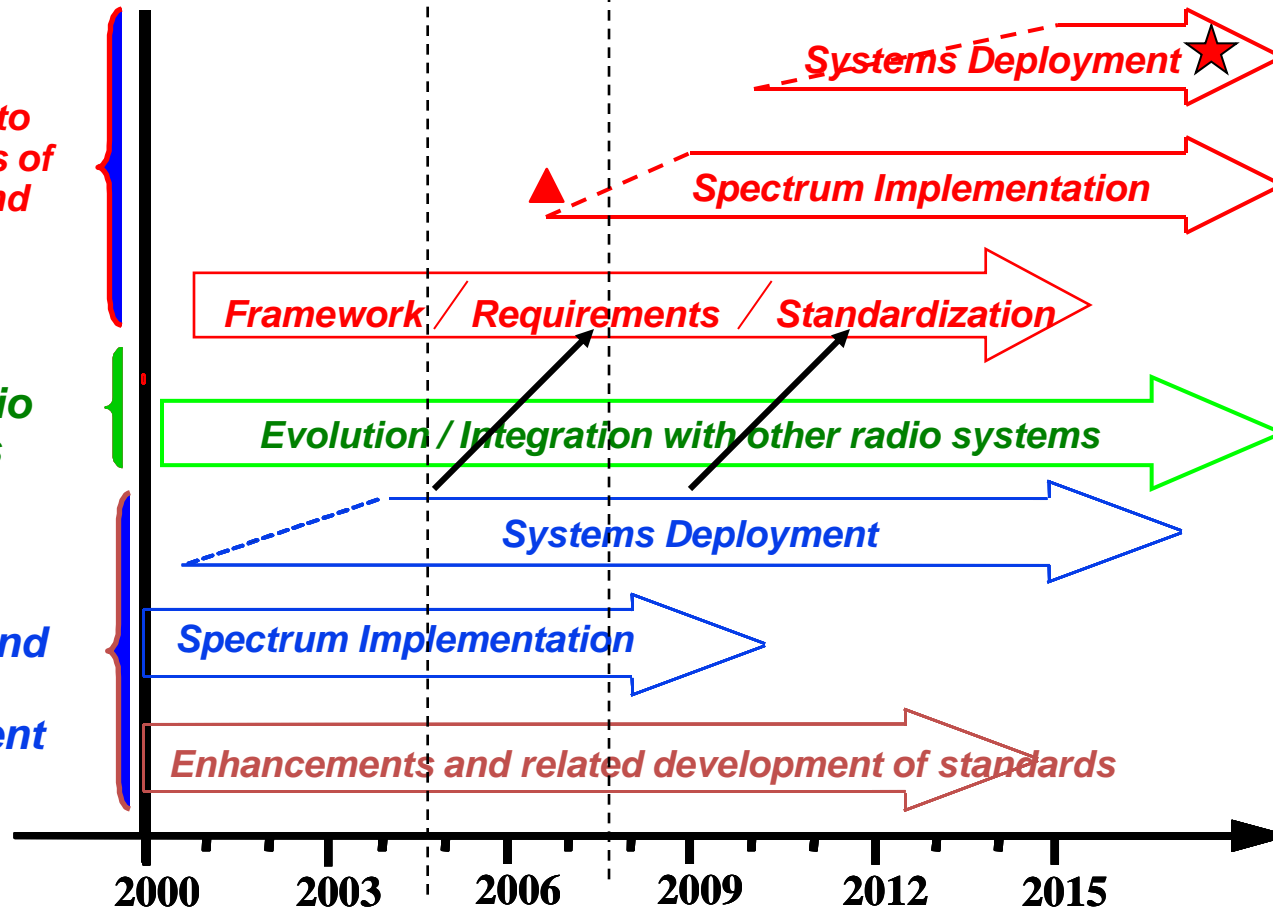


Now WRC-07

New elements to offer capabilities of systems beyond IMT-2000

Other radio systems

IMT-2000 and future development



Indicates that the exact starting point is not yet fixed

Possible spectrum identification at the WRC-07

Possible wide deployment around the year 2015 in some countries

Research & Development

Rec. ITU-R M.1645:

- “Research, on a global basis, be undertaken to address the framework detailed in this Recommendation and into a potential new wireless access technique(s) for the terrestrial component”
- “Research on the specifications for the future development of IMT-2000 and systems beyond IMT-2000 consider how these systems may relate to other radio technologies and systems and how all systems will continue to evolve”
- “New technologies and technology trends be studied”

External R&D

- **Research forums and other external organizations are encouraged to focus especially on:**
 - **Radio interface(s) and their interoperability**
 - **Access network related issues**
 - **Spectrum related issues**
 - **Traffic characteristics**
 - **User estimations**
- **Many organizations currently involved in R&D of systems beyond IMT-2000 or B3G, including:**
 - **WWRF – Wireless World Research Forum**
 - **NGMC – Next Generation Mobile Communication**
 - **mITF – mobile IT Forum**
 - **CCSA – China Communications Standards Association**

Summary

- Flexibility is “designed in” from the outset
- Enhancements already being standardized and will evolve considerably over next 10-15 years – open and market led
- Relationship with other radio systems will take place on a market led basis – regulatory considerations
- New radio interface(s) are expected to be required sometime between 2010-2015
- Spectrum aspects will be considered at WRC-07
- Global cooperation of R&D fora encouraged