GUIDELINES ON SMOOTH TRANSITION FROM THE EXISTING MOBILE NETWORKS TO IMT-2000 FOR DEVELOPING COUNTRIES -GST

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OUTLINE

- ITU-D Study group 2 questions
- Q 18/2 and Q 18-1/2
- MTG and GST
- Development of policy for transition
- Transition Paths to IMT-2000 Systems – Evolution and Migration
- Economics of Mobile Network Deployment
- Case study: IMT-2000 in Serbia
ITU objectives:

- Development of new systems concepts and recommendations
- Assistance to developing countries in developing policy and strategy to meet broadband infrastructural requirements for the emerging Information Society.
STUDY GROUP 2 Study period 2002-2006

- Q 18/2 “Strategy for migration of mobile networks to IMT-2000 and beyond”

STUDY GROUP 2 Study period 2006-2010

- Q 18-1/2 “Implementation aspect of imt-2000 and information-sharing on systems beyond IMT-2000 for developing countries”
WTDC ISTANBUL 2002

- HOW IMT-2000 WILL PROGRESS IN DEVELOPING COUNTRIES?
- HOW TO ASSIST MEMBER STATE AND SECTOR MEMBERS IN DEVELOPING COUNTRIES IN TRANSITION TO IMT-2000, FROM BOTH TECHNICAL AND ECONOMICAL ASPECT?

Q 18/2: “STRATEGY FOR MIGRATION OF EXISTING MOBILE NETWORKS TO IMT 2000 AND BEYOND”
ISSUES PROPOSED FOR STUDY:

- Identify the economic impact and development aspect for such migration, with particular attention to cost affordability for end users, as well as identification of migration techniques taking into consideration the experience of developed countries and the special needs of developing countries.

- Examine the possibility of using first and second generation spectrum for IMT 2000 and beyond.
ITU-D SG 2

Rapporteur Group on Q 18/2 was created, composed of experts from developed and developing countries,

After two and half years, Mid Term Guidelines for Smooth Transition of the Existing Mobile Networks to IMT-2000 (MTG) was approved by SG 2, September 2004, (http://www.itu.int/itudoc/itu-d/question/studygr2/87040.html).

Guidelines for Smooth Transition of the Existing Mobile Networks to IMT-2000 (GST) was approved by ITU-D SG 2 meeting, September 2005 and available on www.itu.int/imt2000
Guidelines for Smooth Transition of the Existing Mobile Networks to IMT-2000 (GST)

Mid Term Guidelines for Smooth Transition of the Existing Mobile Networks to IMT-2000 (MTG)
Structure of the Midterm Guidelines-MTG

(SUMMARY)

1 - INTRODUCTION

2 - DEVELOPMENT OF POLICIES FOR TRANSITIONING OF EXISTING NETWORKS TO IMT-2000

3 – TRANSITION PATHS

4 - ECONOMICS OF TRANSITION TO IMT-2000

5 – CONCLUDING REMARKS

6 - DEFINITIONS

7 - ABBREVIATIONS/GLOSSARY

REFERENCES

ANNEXES A - F

ANNEX G – OPERATOR EXPERIENCE IN TRANSITIONING TO IMT-2000 SYSTEMS
GST STRUCTURE

SUMMARY

1 - INTRODUCTION

2 - DEVELOPMENT OF POLICIES FOR TRANSITION OF EXISTING NETWORKS TO IMT-2000

3 - TRANSITION PATHS

4 - ECONOMICS OF TRANSITION TO IMT-2000

5 - CONCLUDING REMARKS

6 - DEFINITIONS

7 - ABBREVIATIONS/ GLOSSARY

REFERENCES

ANNEX I - OPERATOR’S EXPERIENCES IN TRANSITIONING TO IMT-2000 SYSTEMS
FOR WHOM AND FOR WHAT IS DEVELOPED THE GST?

- TELECOM POLICY DECISION MAKERS
- REGULATORS
- OPERATORS
- OPERATIONAL STAFF
- TRAINING MATERIAL FOR INTRODUCTION OF IMT-2000 SERVICES
- TUTORIALS FOR IMT-2000 STUDIES
IMT-2000 Family members

IMT 2000 Terrestrial Radio Interfaces

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

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<table>
<thead>
<tr>
<th>FULL NAME OF IMT-2000 FAMILY MEMBER</th>
<th>COMMON NAME</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMT-2000 CDMA Direct Spread</td>
<td>UTRA FDD WCDMA UMTS</td>
</tr>
<tr>
<td>IMT-2000 CDMA Multi-Carrier</td>
<td>CDMA2000 1x and 3x CDMA2000 1xEV-DO CDMA2000 1xEV-DV</td>
</tr>
<tr>
<td>IMT-2000 CDMA TDD (time-code)</td>
<td>UTRA TDD 3.84 mcps high chip rate UTRA TDD 1.28 mcps low chip rate (TD-SCDMA) UMTS</td>
</tr>
<tr>
<td>IMT-2000 TDMA Single-Carrier</td>
<td>UWC-136 EDGE</td>
</tr>
<tr>
<td>IMT-2000 FDMA/TDMA (frequency-time)</td>
<td>DECT</td>
</tr>
</tbody>
</table>
## IMT-2000 CORE NETWORKS

<table>
<thead>
<tr>
<th>FULL NAME</th>
<th>ITU-T RECOMMENDATIONS IDENTIFYING THIS CN</th>
<th>IMT-2000 RADIO TECHNOLOGIES</th>
</tr>
</thead>
</table>
| GSM evolved UMTS Core Network | Q.1741.1 (referring to 3GPP Release 99)  
Q.1741.2 (3GPP Release 4)  
Q.1741.3 (3GPP Release 5)  
Q.1741.m (m signifies future releases) | IMT-2000 CDMA Direct Spread  
IMT-2000 CDMA TDD  
IMT-2000 TDMA Single-Carrier |
| ANSI-41 evolved Core Network with cdma2000 Access Network | Q.1742.1 (3GPP2 spec. as of 17 July 2001)  
Q.1742.2 (3GPP2 spec. as of 11 July 2002)  
Q.1742.3 (3GPP2 spec. as of 30 June 2003)  
Q.1742.n (n signifies future releases) | IMT-2000 CDMA Multi-Carrier |
IDENTIFIED FREQUENCY BANDS

**WARC-92:**
- 1885-2025 MHz and 2110-2200 MHz

**WRC-2000:**
- 806-960 MHz, 1710-1885 MHz and 2500-2690 MHz
WHAT ARE DRIVING FORCES WORLDWIDE?

Convergence

Media Industry
- browsing
- broadcasting
- publishing
- entertainment

Telecom Industry
- mobility
- fixed

Computer Industry
- desktop computing
- PC
- PC-LAN

Information Society
- electronic
- internet
- datacom

WHAT ARE DRIVING FORCES WORLDWIDE?
WHERE ARE THE MOST OF DEVELOPING COUNTRIES?

**1st generation**
Analogue speech
NMT, AMPS, TACS

**2nd generation**
Digital speech + medium-rate data
GSM, PDC, IS-95, IS-136 (D-AMPS)

**3rd generation**
High speed data
Multiple services
Global roaming
IMT-2000

WHERE ARE THE MOST OF DEVELOPING COUNTRIES?

1980 1990 2005/7 DEVELOPED COUNTRIES

1990 1995 2006 DEVELOPING COUNTRIES

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DEVELOPMENT OF POLICY FOR TRANSITION

SPECIAL NEEDS OF DEVELOPING COUNTRIES:

- GOVERNMENT POLICY FOR DEVELOPMENT
- OPERATOR PERSPECTIVE
- REGULATOR PERSPECTIVE
- CONSUMER-USER PERSPECTIVE
GOVERNMENT DEVELOPMENT POLICY

- Developing countries are challenging the entrance to global e-economy markets (knowledge economy)
- Geneva WSIS principles of declaration, plan of action
- Tunis WSIS agenda and commitment
GOVERNMENT DEVELOPMENT POLICY

WSIS DECLARATION OF PRINCIPLES:

Building the Information Society: a global challenge in the new Millennium

– Information and communication infrastructure: an essential foundation for an inclusive information society

– A well-developed information and communication network infrastructure and applications, adapted to regional, national and local conditions, easily-accessible and affordable, and making greater use of broadband and other innovative technologies where possible, can accelerate the social and economic progress of countries, and the well-being of all individuals, communities and peoples
GOVERNMENT DEVELOPMENT POLICY

WSIS ACTION PLAN to be achieved by 2015:

a) to connect villages with ICTs and establish community access points;

b) to connect universities, colleges, secondary schools and primary schools with ICTs;

c) to connect scientific and research centres with ICTs;

d) connect public libraries, cultural centres, museums, post offices and archives with ICTs;

e) to connect health centres and hospitals with ICTs;

f) to connect all local and central government departments and establish websites and email addresses;

g) to adapt all primary and secondary school curricula to meet the challenges of the Information Society, taking into account national circumstances;

h) to ensure that all of the world's population have access to television and radio services;

i) to encourage the development of content and to put in place technical conditions in order to facilitate the presence and use of all world languages on the Internet;

j) to ensure that more than half the world’s inhabitants have access to ICTs within their reach.
IMT-2000 ACCOMODATES NEEDS FOR NII IN DEVELOPING COUNTRIES

- FOR URBAN AREAS
- FOR SPARCELY POPULATED AREAS
- FOR MIX URBAN/RURAL AREAS
OPERATOR PERSPECTIVE FOR TRANSITION TO IMT 2000

- Cost
- Fixed wireless access
- Coverage and deployment obligations
- Transition time
- Mass application
- Spectrum
- Infrastructure sharing
- Satellite components
- Market analysis and business case
- Service and applications
- Availability of equipment from multiple vendors
Operate's Business Position Towards IMT-2000

- Market Development
- Who are competitors and in which market segments?
- Development of marketing strategy

- Market and Competition

- Regulatory Framework
  - Strategy to meet regulation requirements
  - Licensing conditions

- Internal structure, processes
  - How to optimaze investment
  - How to decrease OPEX
  - How to prepare organization for new technology

- Partnerships
  - Partnership with content's providers
MARKET SEGMENTS

DEVELOPED COUNTRIES:

I. EXAMPLE
- business professional,
- product managers,
- young generation,
- family,
- senior citizens

II. EXAMPLE
- pioneers,
- materialist,
- sociables,
- achievers and
- traditionalist

DEVELOPING COUNTRIES

LESS DIFFERENTIATIONS

EXAMPLE:
- Business professional
- SME
- Private
- Young generation???
- Solutions for universal access
- Roamers!!!!!
Mobile data revenues on the rise

Data % of revenue Top 20 operators

- Philippines - Smart: 49%
- Philippines - Globe: 38%
- Japan - NTT DoCoMo: 26%
- Japan - KDDI: 24%
- Indonesia - Telkomsel: 24%
- Japan - Vodafone: 22%
- Czech Republic - T-Mobile: 21%
- Ireland - Vodafone: 21%
- Germany - 02: 20%
- Korea - SK Telecom: 19%
- Ireland - 02: 19%
- Singapore - SingTel: 19%
- Singapore - MobileOne: 18%
- Germany - Vodafone: 17%
- Germany - T-Mobile: 17%
- Korea - KTF: 17%
- Belgium - Proximus: 17%
- Venezuela - movilnet: 16%
- Switzerland - Orange: 16%
- Germany - E-Plus: 16%

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SOURCE ERICSSON 2005
Lots of mobile applications available!
What’s about local providers?

Most will never become mass market services (YankeeGroup 2006)

How often do you do the following with your mobile phone?

- Send SMS
- Take Pictures
- Play mobile games
- Send picture messages
- Receive SMS alerts
- Mobile internet browsing
- Send e-mail
- Listen to downloaded music
- Download ringtones
- Send IM
- Download music tracks
- Watch video clips/TV
- Download mobile games
- Send video messages
- Make video calls

% of respondents

- Daily
- Weekly
- Monthly
INTEREST FOR RANGE OF SERVICES

- Positioning Service (GPS)
- Friend Locator Service
- E-Mail
- Video Telephony
- Current Availability
- Browsing the Internet
- Information Updates
- Walkie Talkie Anywhere
- Multimedia/Picture Messaging
- Share a picture while talking
- Music Download Service
- Text Chat
- On-Line Picture Album
- Music Videos/Movie Trailers
- Share a Video Clip while talking
- Game Download Service

SOURCE ERICSSON 2005
## REGULATOR’S PERSPECIVE

<table>
<thead>
<tr>
<th>ITEM</th>
<th>REGULATOR’S NEEDS AND RATIONALE</th>
</tr>
</thead>
</table>
| LICENSE HANDLING AND ALLOCATION | Capitalize on experience of developed countries on:  
- license awarding method  
- license conditions,  
- license fees,  
- number of licenses |
| DATABASES | Capitalize on experience of developed countries on:  
- RFP (Request for Proposal) issued for awarding IMT-2000 licenses;  
- Rationale behind the preferred license awarding methods;  
- Information on the method of determination of Lowest Bid Rates;  
- Standard concession agreements – including provisions related to QoS numbering, interconnection, roaming, coverage, infrastructure sharing etc. – that were signed with the IMT-2000 operators;  
- A list of rights and obligations of the IMT-2000 operators, including the rationale behind each. |

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REGULATORY FLEXIBILITY

◆ ADOPTION OF FLEXIBLE POLICY FOR SPECTRUM ALLOCATION

◆ ITU FREQUENCY BANDS FOR IMT 2000

◆ POSSIBILITY TO FACILITATE IN-BAND MIGRATION
# USER’S PERSPECTIVE

<table>
<thead>
<tr>
<th>ITEMS</th>
<th>USER NEEDS AND RATIONALS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>COST</strong></td>
<td>User affordability for services and terminals.</td>
</tr>
<tr>
<td></td>
<td>◆ Tariffs should be affordable to the end-users</td>
</tr>
<tr>
<td><strong>TERMINALS</strong></td>
<td>Ease of use and convenience of terminals.</td>
</tr>
<tr>
<td></td>
<td>◆ The terminals should support local requirement in terms of language and must take into consideration the literacy level across the country.</td>
</tr>
<tr>
<td><strong>EASY ROMING</strong></td>
<td>◆ Users want to use their usual terminals when traveling.</td>
</tr>
<tr>
<td></td>
<td>◆ Roaming is facilitated by low prices and by the availability of compatible technologies/terminals in foreign countries.</td>
</tr>
<tr>
<td>Services and applications</td>
<td>Use of IMT-2000 for education in remote villages, rural economic development, access to Internet at affordable price.</td>
</tr>
<tr>
<td></td>
<td>Training of users on wireless data applications.</td>
</tr>
</tbody>
</table>
Transition Paths to IMT-2000 Systems – Evolution and Migration

**Evolution** – “a process of change and development toward enhanced capabilities”

**Migration** – “movement of users and/or service delivery from an existing system to a new system”

*ITU-R Recommendation M.1308*
Transition Paths to IMT-2000 Systems

Radio Access Upgrades
- TACS
- NMT
- AMPS

Core Network Upgrades
- Pre MAP
- Pre IS-41

1G-operators → 2G-operators → 3G-operators

- PDC
- GSM/GPRS
- TDMA
- IS-95
- CDMA2000
- UTRAN
- GERAN

*) via UWC-136/EDGE
### Transition Paths to IMT-2000 Systems - Spectrum Usage

**KEY**
- A: pre-IMT-2000 system
- B: IMT-2000 system
- A -----> B: A migrates to B
- A - - - - B: A evolves to B
- f1: operator’s current spectrum band
- f2: operator’s new spectrum band (different from f1)

#### Spectrum Bands

<table>
<thead>
<tr>
<th></th>
<th>Same</th>
<th>Different</th>
</tr>
</thead>
<tbody>
<tr>
<td>Backward</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compatibility</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Scenarios

1. **Scenario 1:** A -----> B
   - A: pre-IMT-2000 system
   - B: IMT-2000 system
   - f1: operator’s current spectrum band
   - f2: operator’s new spectrum band (different from f1)

2. **Scenario 2:** A -----> B
   - A: pre-IMT-2000 system
   - B: IMT-2000 system
   - f1: operator’s current spectrum band
   - f2: operator’s new spectrum band (different from f1)

3. **Scenario 3:** A -----> B
   - A: pre-IMT-2000 system
   - B: IMT-2000 system
   - f1: operator’s current spectrum band
   - f2: operator’s new spectrum band (different from f1)

4. **Scenario 4:** A -----> B
   - A: pre-IMT-2000 system
   - B: IMT-2000 system
   - f1: operator’s current spectrum band
   - f2: operator’s new spectrum band (different from f1)
Economics of Mobile Network Deployment

The “business plan” methodology

- Estimation of the year traffic demand
  - Estimation of potential user population
  - Estimation of service penetration
  - Estimation of activity factor (per service type and class)
  - Estimation of OPEX
- RAN planning
- Core Network planning
- Assumption on revenue structure for offered services
- Computation of NPV

**Net Present Value (NPV):** Cumulative discounted cash-flow generated to date, or less formally: The profitability of a business, as appreciated a Year 0, over a span of N years - N ranging from 1 to the economic life of the system
Economics of IMT-2000 Deployment

The “business plan” methodology
Economics of Mobile Network Deployment

Total population over the service area

Customer base

Dense urban
Urban
Suburban
Rural

User population & service penetration

Business | Consumer

Packet switched services

Circuit switched services

CS

12
64
128

PS

64
128
384

Economics of Mobile Network Deployment

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Economics of Mobile Network Deployment

- Circuitswitched services
- Packet switched services
- Traffic loading
- RAN Dimensioning and Planning Tools
- Deployment strategies & policies
- IMT-2000 Network Deployment

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## Economics of IMT-2000 Deployment – Share of Investments

### RAN
- Node Bs
- RNCs
- UTRAN transport infrastructure

<table>
<thead>
<tr>
<th>Year</th>
<th>Rel-99</th>
<th>from Rel-99 to Rel-5</th>
<th>Capacity increases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 0</td>
<td>55%</td>
<td>55%</td>
<td>60%</td>
</tr>
<tr>
<td>Year 3</td>
<td>30%</td>
<td>35%</td>
<td>30%</td>
</tr>
<tr>
<td>Year 4 to Year 10</td>
<td>15%</td>
<td>10%</td>
<td>10%</td>
</tr>
</tbody>
</table>

### Core Network
- MSCs & MSC servers
- SGSNs & GGSNs
- MGWs
- CSCFs, MGCFs, T-SGWs, MRFs
- Core network transport infrastructure

<table>
<thead>
<tr>
<th>Year</th>
<th>Year 0</th>
<th>Year 3</th>
<th>Year 4 to Year 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 0</td>
<td>50%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Year 3</td>
<td>35%</td>
<td>60%</td>
<td>65%</td>
</tr>
<tr>
<td>Year 4 to Year 10</td>
<td>0%</td>
<td>10%</td>
<td>10%</td>
</tr>
</tbody>
</table>

### Service Market Segment
- Business
- Consumer

<table>
<thead>
<tr>
<th>Year</th>
<th>Year 0</th>
<th>Year 3</th>
<th>Year 4 to Year 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 0</td>
<td>65%</td>
<td>60%</td>
<td>50%</td>
</tr>
<tr>
<td>Year 3</td>
<td>35%</td>
<td>40%</td>
<td>50%</td>
</tr>
</tbody>
</table>

### Tariffs
- 3% yearly reduction in over the whole economic life cycle
## Economics of Mobile Network Deployment

### – Sensitivity Analysis –

| Deviation from assumed service mix | SM+ ⇒ Y3: +10%, Y10: +25%
| SM- ⇒ Y3: -10%, Y10: -25% |
| Deviation from assumed service penetration | SP+ ⇒ Y3: +10%, Y10: +25%
| SM- ⇒ Y3: -10%, Y10: -25% |
| Yearly deviation from tariff erosion | TE+ ⇒ +10%
| TE- ⇒ -10% |
| Alternative scenario | Year 0 | Year 3 | Year 4 to Year 10 |
| Service Market Segment | 65% | 60% | 50% |
| - Business | 35% | 40% | 50% |
| - Consumer |

**SM**: Service Mix Erosion  
**SP**: Service Penetration  
**TE**: Tariff Erosion
ECONOMICS OF MOBILE NETWORK Deployment

NPV analysis

- Traffic demand
- Service penetration
- Tariff erosion
- Service offering

NPV analysis

Traffic demand
Service penetration
Tariff erosion
Service offering

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Economics of Mobile Network Deployment

- Sensitivity analysis
  - Traffic demand
  - Service penetration
  - Tariff erosion
  - Service offering

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Structure of the Business Plan Model (more details in MTG)

- From market share growth to:
  - Reduce Churn
  - Increase ARPU
  - Increase use of services
  - Affordable new services

Considerations:
- Regulations (old & new)
- Purchasing Power (pre-paid)
- GDP and major trade partners
- Virtual Home Environment
Business Plan

The market and revenue simulations are the key modules of business plan tool.

Operator Benchmarking

Business Plan Methodology:

- OPEX Module
- Subscriber Module
- Accounting Module
- Revenue Module
- CAPEX Module

Business Plan Results:

- Profitability Ratios
- Cash Flow Statement
- Profit / Loss Statement
- Balance Sheet
**ANNEX I: OPERATOR’S EXPERIENCES**

<table>
<thead>
<tr>
<th>Scenarios</th>
<th>Operator Experiences</th>
<th>Pre IMT-2000 (Frequency)</th>
<th>IMT-2000 Network (Frequency)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scenario 1</td>
<td>Russian Federation</td>
<td>NMT 450 (450 MHz)</td>
<td>CDMA2000 1x (450 MHz)</td>
</tr>
<tr>
<td>Scenario 2</td>
<td>Chile (Telefónica Móvil de Chile)</td>
<td>AMPS/TDMA (850 MHz)</td>
<td>GS+M/GPRS/EDGE (1 900 MHz)</td>
</tr>
<tr>
<td>Scenario 2</td>
<td>Japan (NTT DoCoMo)</td>
<td>PDC (800 MHz)</td>
<td>WCDMA (2 000 MHz)</td>
</tr>
<tr>
<td>Scenario 3</td>
<td>Hong Kong (Hong Kong CSL Ltd)</td>
<td>GSM/GPRS (900/1 800 MHz)</td>
<td>GSM/GPRS/EDGE (900/1 800 MHz)</td>
</tr>
<tr>
<td>Scenario 3</td>
<td>Japan (KDDI: au)</td>
<td>cdmaOne (800 MHz)</td>
<td>CDMA2000 1x (800 MHz)</td>
</tr>
<tr>
<td>Scenario 3</td>
<td>Thailand (Advanced Info Service Public Co. Ltd)</td>
<td>GSM/GPRS (900 MHz)</td>
<td>GSM/GPRS/EDGE (900 MHz)</td>
</tr>
<tr>
<td>Scenario 3</td>
<td>Venezuela</td>
<td>TDMA (800 MHz)</td>
<td>CDMA2000 1x (800 MHz)</td>
</tr>
<tr>
<td>Scenario 4</td>
<td>Hungary (Pannon GSM Telecommunications Ltd)</td>
<td>GSM (900 MHz)</td>
<td>GSM/GPRS/EDGE (1 800 MHz)</td>
</tr>
</tbody>
</table>
CASE STUDY: IMT 2000 IN SERBIA

SERBIA IS DEVELOPING COUNTRY with 8 million inhabitants

TELECOM SECTOR STRUCTURE
- MINISTRY FOR CAPITAL INVESTMENT
- NATIONAL REGULATORY AGENCY-RATEL
- OPERATORS

TELECOM DEVELOPMENT:
- 2,6 Million fixed subscribers
- 5 Million mobile subscribers
- One fixed operator
- Two mobile operators,
- 38 ISPs, >20 Cable Distribution Systems

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Some key questions for 3G evolution/migration

- Licensing
- 2GHz frequency band occupied
- Transmission network evolution both for core and access network to meet requirements for increased flexibility, capacity and availability
- Terminals availability covering GSM/GPRS/EDGE/WCDMA (handsets and PCMCI cards)
- Readiness of operator's organizations for 3G (resources, competencies...)
- Evolution vs. migration
- CS & PS handovers
- Role of IMT-2000 in Corporate Social Responsibility:
  - The responsibility of the state/government, vendors, operators and regulators in support of the new technologies
- Readiness for the Information Society
- Pilot 3G Networks are implemented at both operators: TELENOR and Telekom Srbija
UMTS AND FWA LICENCES

**TWO BY GOVERNMENT DECISION, THIRD WILL BE ISSUED IF**
- ONE LICENCE IS ISSUED DURING THE PROCESS OF SELLING GOVERNMENT SHARE IN MOBI 63 NETWORK (70%) FOR 1.5 BILLIONS EUROS
- NEW OWNER (TELENOR) PAID € 320 MIL. FOR GSM LICENCE WITH ASSOCIATED UMTS LICENCE
- SECOND LICENCE WITH UMTS IS GRANTED FREE OF CHARGE TO TELEKOM SRBIJA AS INCUMBENT OPERATOR OPERATING FIXED AND GSM NETWORK

**HI BRID METHOD APPLIED**
- EXPRESSION OF INTEREST FOR COMPANIES FULFILLING REQUIREMENTS (GOVERNMENT AND CONSULTING COMPANY)
- SELECTION
- OFFERS
- AUCTION

**12 FREQUENCIES** IN 3.5 GHZ, TECHNOLOGY NUTRAL ARE GRANTED TO TELEKOM SRBIJA FOR FWA TO SPEED UP BROADBAND UNIVERSAL ACCESS

**OTHER FREQUENCIES** IN 3.5 WILL BE AUCTIONED FOR ISPs
Pre-commercial WCDMA/UMTS Systems

- Both operator
- One operator (TELENOR) has UMTS system from one vendor (Ericsson) installed only in capital city
- Other operator (TELEKOM SRBIJA) has four locations with UMTS systems in four largest cities from four vendors (Ericsson, Alcatel, Siemens and Huawei)
Purpose of the pre-commercial WCDMA/UMTS Systems

- Use of WCDMA/UMTS pre-commercial trial for different traffics (European Basketball Championship)
- Perform interoperability testing in order to prepare the operator’s network for the fast 3G launch
- To give the opportunity to operators to:
  - Build up competence and get hands on experience of IMT-2000 networks and services
  - Implement and test end-to-end solution for a 3G system in compliance with 3GPP R99 specs
  - Look into integration issues, e.g. billing and customer care
  - Prepare for an early IMT-2000 launch - immediate transition to commercially ready-for-launch network
  - Hold market events

18-21 SEPTEMBER 2006  ITU SEMINAR YAOUNDE
WCDMA/UMTS Trial

Responsibilities:

Vendor

• 3G System:
  ❖ Hardware
  ❖ Software
  ❖ Implementation services
  ❖ Operation & Maintenance
  ❖ Support

Operators:

• Licenses
• USIMs
• Terminals
• Transmission
• Floor Space
• Power Supply (except for RBSs)
Operators’ Business Plans with Gradual Introduction of the UMTS Relative to the GSM/EDGE

- EDGE used as a complement to WCDMA
- Service Continuity
- Seamless Network
- Business aspects for rural areas

GSM/GPRS

2003

GSM/GPRS

2004

GSM/GPRS

2005

GSM/GPRS

2006

UMTS

EDGE

EDGE

EDGE

EDGE

EDGE

EDGE
End-user services that could be offered

<table>
<thead>
<tr>
<th>Basic Services</th>
<th>Voice</th>
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<tbody>
<tr>
<td></td>
<td>SMS</td>
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<td>MMS</td>
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<td>Browsing</td>
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<td>Gaming</td>
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<table>
<thead>
<tr>
<th>Video Services</th>
<th>Video/Music Streaming</th>
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<tbody>
<tr>
<td></td>
<td>Mobile TV</td>
</tr>
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<td>Video Download</td>
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</tbody>
</table>

| Videocall        | “Rich Call” *         |

* Possibility to use multimedia services during a voice call
COMMERCIAL START UP

- BOTH OPERATOR ARE IN TENDER PROCEDURE FOR PURCHASING UMTS FOR NATIONAL COVERAGE
- COMMERCIAL UMTS IN FIRST HALF 2007
SUMMARY

- ITU-D ACTIVITIES ON IMT-2000
- Mid Term Guidelines & Guidelines for Smooth Transition from the existing network to IMT-2000 for developing countries
- Government, operator, regulator transition policy
- User perspective
- Economics in transition
- Serbia case in transitioning towards IMT-2000
THANK YOU FOR YOUR ATTENTION! n.gospic@sf.bg.ac.yu