

*ITU-BDT Workshop on guidelines on the smooth  
transition of existing mobile networks to IMT-2000 for  
developing countries - Arab Region*



# Transition Path to IMT- 2000 in Serbia

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## AGENDA

- GSM/EDGE/WCDMA Seamless Network
- Serbia&Montenegro Country Information
- Serbia&Montenegro Telecom Market
- Mobile Operators in Serbia
- UMTS/WCDMA Pilot Precommercial Networks

## Mobile Market Segmentation in Europe

- Well Developed GSM operators in Europe going WCDMA
- GSM operators still building out coverage

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## Well Developed GSM operators going WCDMA

### **The GSM and WCDMA evolution raises several critical questions for the operator:**

- How can operators maximize and reuse current GSM assets?
- How can they deploy WCDMA while maintaining profitability in GSM?
- How do they best allocate investments between GSM and WCDMA infrastructures?
- How will users experience the new combined GSM and WCDMA services?

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## Well Developed GSM operators going WCDMA

Seamless Network - Ericsson's view on how existing GSM networks will evolve and interwork with WCDMA

- The evolution scenarios, operator needs and suggested solutions
- System evolution for GSM, the introduction of third-generation (3G) services and the integration of GSM and WCDMA to form a seamless network
- Evolution of GSM and WCDMA networks as a single, unified seamless network that shares core, transmission, radio and application resources.
- The seamless network ensures the most efficient use of GSM and WCDMA
- Seamless user experience – transparency of services to users
- Ensures operator's investment protection in GSM/GPRS and re-use of 2G/2.5G equipment for WCDMA networks

## Well Developed GSM Operators Going WCDMA

3G Service Continuity

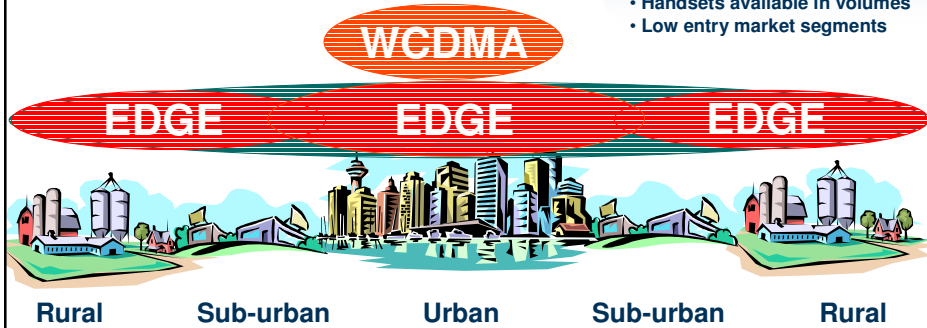
### Challenges:

- Make Applications adaptive
- Surviving handover between two Network Technologies

# Well Developed GSM Operators Not Going WCDMA in Near Time

Roll-Out Options

- Start Building EDGE coverage in dense areas
- Use GPRS as fallback initially
- Be competitive if WCDMA is available in other networks
- Handsets available in volumes
- Low entry market segments



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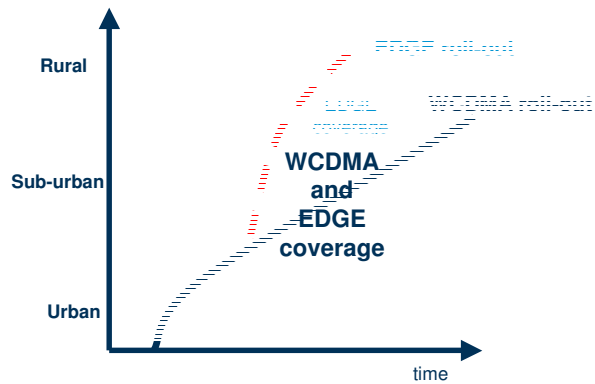
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# Well Developed GSM Operators Going WCDMA

Roll-Out Options – Time-To-Market by Fast Roll Out

One EDGE TRU per cell for coverage

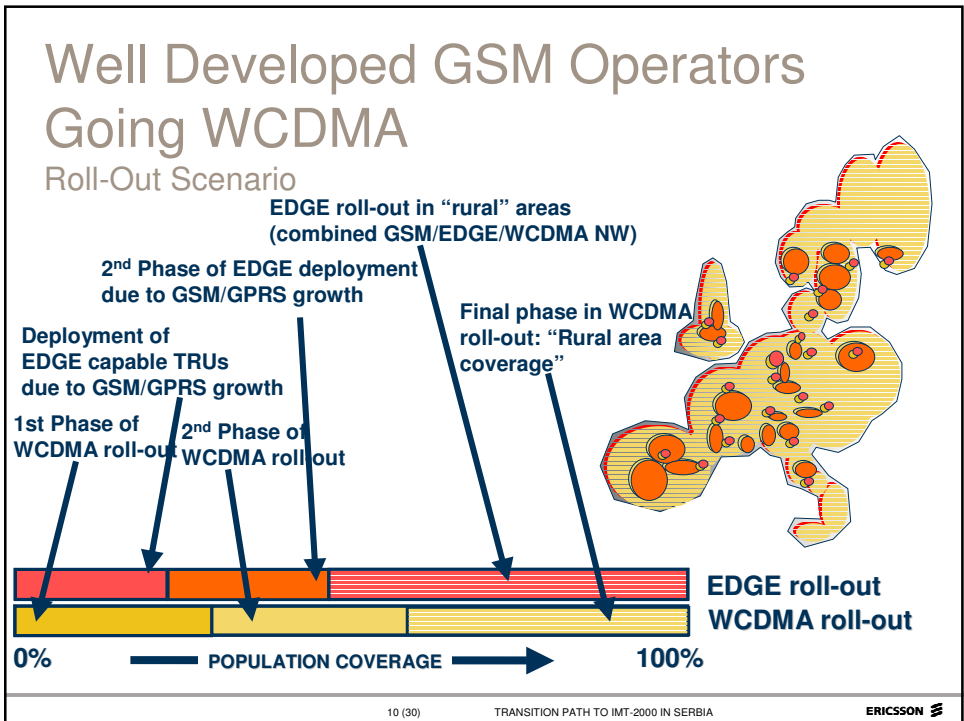
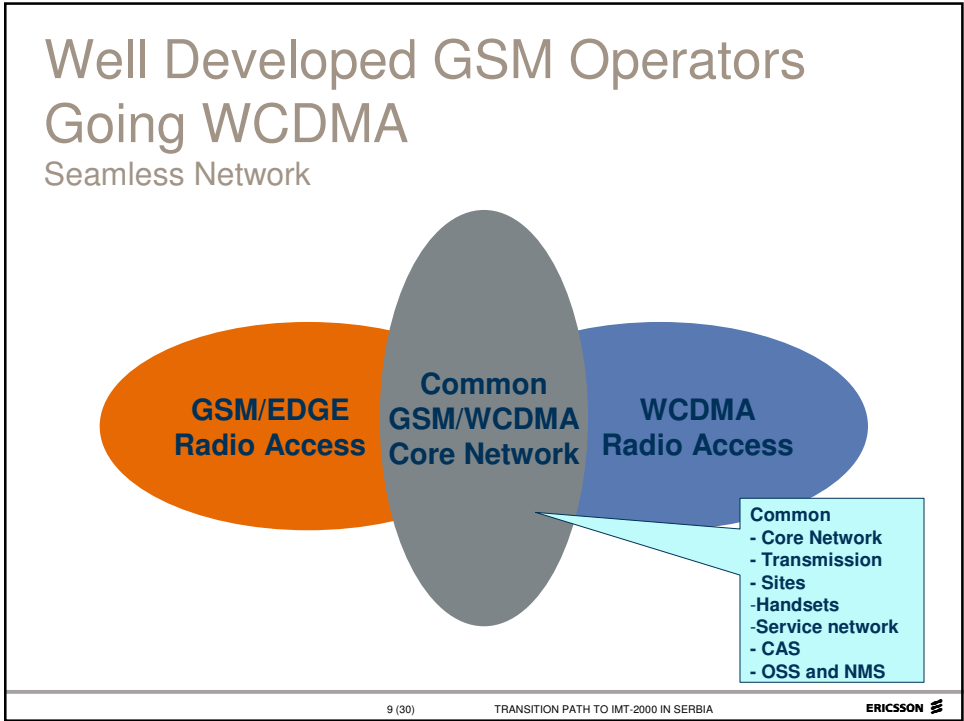
RBSs EDGE enabled



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## Well Developed GSM Operators Going WCDMA

Seamless Network - Benefits Introduced

100% node reuse

50% spectrum gain

50% transmission savings

80% co-siting

Common Network Management

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## Well Developed GSM Operators Going WCDMA

Seamless Network

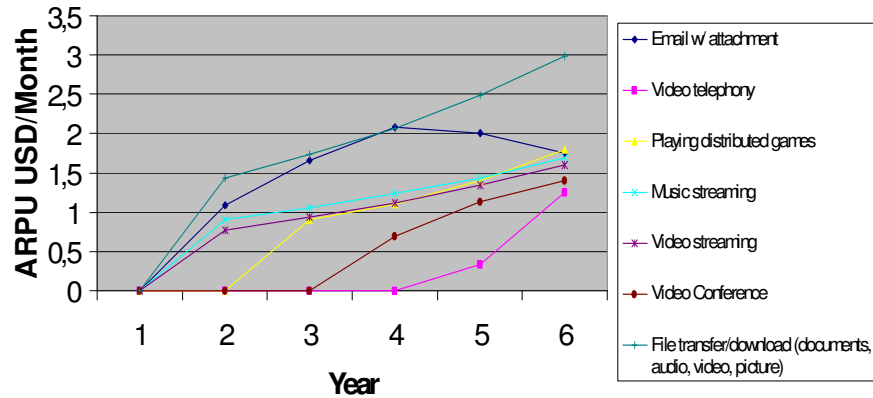
**Same Applications & Devices**

**Seamless towards the user**

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## Well Developed GSM Operators Going WCDMA

ARPU per Service



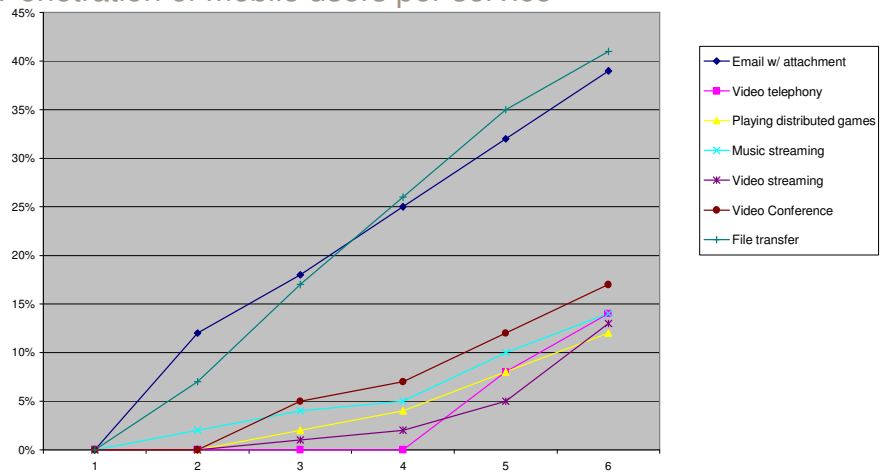
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## Well Developed GSM Operators Going WCDMA

Penetration of mobile users per service



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## Serbia and Montenegro (former Yugoslavia)

### The Republic of Serbia :

- Territory: 88.361 sq.km
- Population:
  - 7,5 mil. with 110 inh./sq.km
  - Belgrade with 2 mil.citizens
- GDP per capita 3000\$ (2004)
- GDP yearly increase 13%



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## Mobile operators status in Serbia

- **063 MOBTEL**  
SRBIJA, Mobile Telecommunications "Srbija" BK-PTT, operates as a joint-venture company by :
  1. "BK Trade", Moscow (51% shares – private capital)
  2. PTT "Srbija" (49 % shares – state capital)
- 064 TELEKOM, Mobile Telecommunications of Srbija, operates as a joint-venture company by:
  1. PTT "Srbija" (80% shares – state capital)
  2. OTE Greece (20% shares – private capital)

*Cross ownership of the two operators by PTT !*

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## Mobile market in Serbia

### GSM 900/1800 operators :

1. 063 MOBTEL (launched in 1996)
2. 064 Telekom Srbija (launched in 1998)

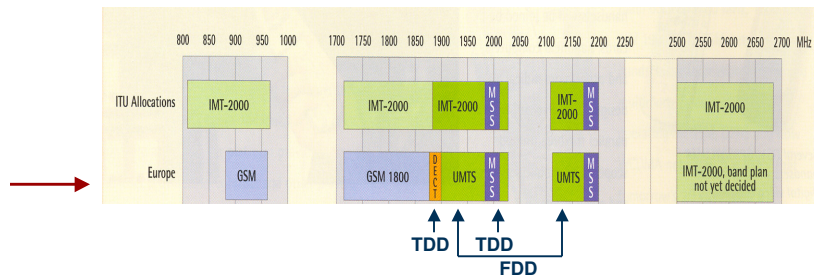
Total mobile subscribers: 4,7 millions (60% penetration)

Market share: 47/53 % (Mobtel/Telekom)

## Regulation in Serbia

- *Competition* market, increasing the benefits in terms of price and QoS, is not yet regulated completely.
- New Telecom Act is approved in April, 2003, designed on the basis of EU legislation ( *licensing, interconnection, transparent, objective and non-discriminatory basis, open network provision on all hierarchical level, competition for the open market*).
- New Act is not yet put into force, since the management board of NRA is not yet approved by the Parliament.
- Telekom Srbija ( incumbent) operates public fixed network and mobile network as well, with monopoly for fixed telephony until June, 2005. → *liberalization allowing new players!*
- No official announcement has been issued for the *IMT-2000 license*, frequency bands are still *occupied* by other users.

## Frequency bands for UTRA (UMTS Terrestrial Radio Access)



1. 60 MHz x 2 for FDD = 1920-1980/2110-2170 MHz (up/down link)
2. 20 + 15 MHz for TDD = 1900-1920 + 2010-2025 MHz (up+down link)

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## Frequency bands allocated in Serbia

- Frequency Plan is adopted by the Authority in Serbia, quite fully in accordance with WARC/ITU and CEPT/ECC/ERC decisions and recommendations.
- Bands allocated for the UMTS/IMT-2000 network are:
  1. 1900 – 1939 MHz | UMTS TDD/FDD
  2. 1930 – 1980 MHz |
  3. 1980 – 2010 MHz (mobile satellite component)
  4. 2010 – 2025 MHz | UMTS TDD
  5. 2110 – 2120 MHz } UMTS
  6. 2120 – 2170 MHz }
  7. 2170 – 2200 MHz (mobile satellite component)
  8. 2500 – 2520 MHz |
  9. 2520 – 2655 MHz | UMTS
  10. 2655 – 2670 MHz
  11. 2670 – 2690 MHz
- All bands are currently occupied and a negotiations with the User should be finalised before the licensing procedure start.

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## REGULATORY AGENCY

- Set-up future requirements in the overall telecom sector regulation process
- Analyse the data from mobile market survey and define needs and demands
- Put into force the new Telecom Act → ASAP!
- Main priority is to remove measures that restrict competition
- Free the frequency bands for the IMT-2000 (UMTS) development
- Define the principles and methods for the licensing
- Define the preconditions of the licenses
- Define obligations related to the universal services
- Define the number of licenses, based on market potential
- Proceed with the licensing process!

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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 PCMCIA 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 to support new technologies bringing new dimension of communications. Preparing for the Information Society inclusion.
- Pilot 3G Network for Mobtel and Telekom Srbija

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## Purpose of the Ericsson's Pre-Commercial WCDMA/UMTS Systems

- Use of WCDMA/UMTS pre-commercial trial for different kinds of load and 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

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## WCDMA/UMTS Trial

Responsibilities:

### **Ericsson:**

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

### **Operators:**

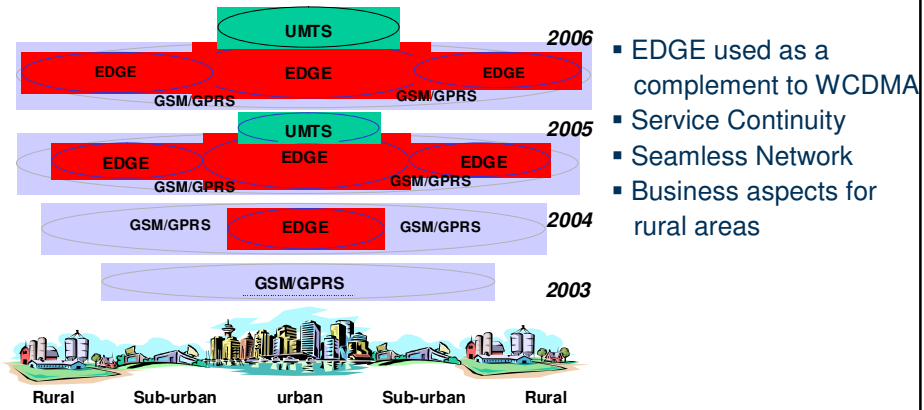
- Licenses
- USIMs
- Terminals
- Transmission
- Floor Space
- Power Supply (except for RBSs)

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## Operators' Business Plans with Gradual Introduction of the UMTS Relative to the GSM/EDGE

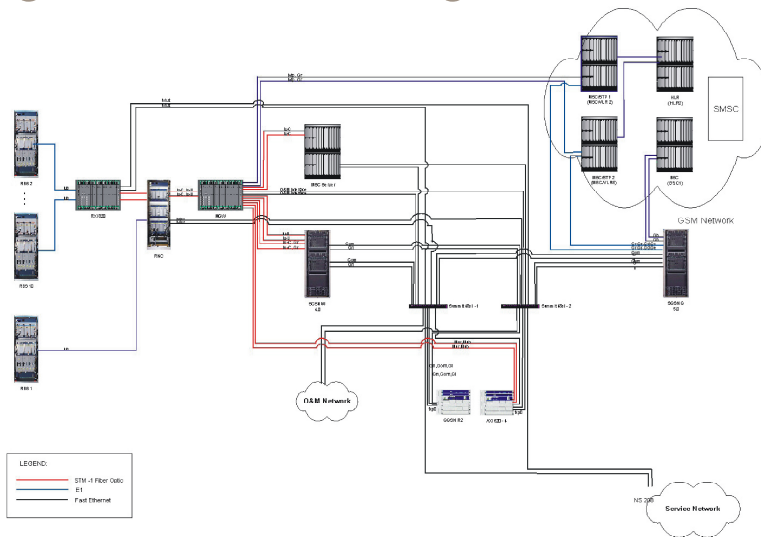


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## Telekom Srbija – Ericsson 3G Network Diagram – Trial Configuration

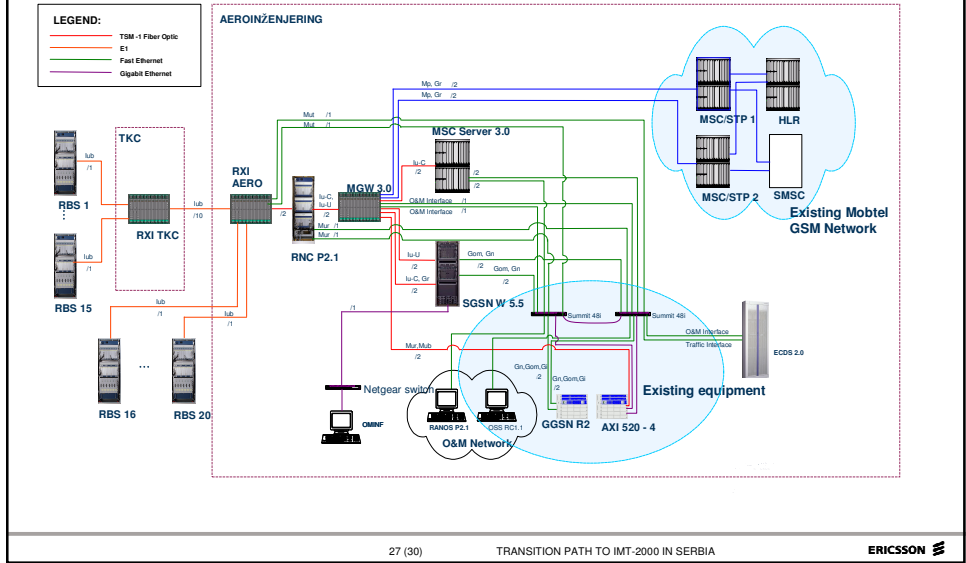


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# Mobtel – Ericsson 3G Network Diagram – Trial Configuration



## End-user services that could be offered

Basic Services	Voice
	SMS
	MMS
	Browsing
	Gaming
Video Services	Video/Music Streaming
	Mobile TV
	Video Download
Videocall	
"Rich Call" *	



\* Possibility to use multimedia services during a voice call

## RAN Functionalities

### **Radio Access Bearers Supported:**

Conversational RAB for AMR speech 12.2 kbps

Conversational RAB for 64 kbps multimedia

Interactive RAB, RB 64/64 kbps (UL/DL)

Interactive RAB, RB 64/128 kbps (UL/DL)

Interactive RAB, RB 64/384 kbps (UL/DL)

Streaming RAB for non-transparent Circuit Switched data,  
57.6 kbps

Speech and Packet data RAB combination

### **GSM Handover:**

UMTS to GSM Handover (Cell Re-selection, Voice, PS  
Data, MultiRab)

GSM to UMTS Handover (Cell Re-selection, Voice, PS  
Data)

Thank you for your attention !

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