MOBTEL's Migration Path to 3G

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The Union of Serbia and Monte Negro

The Republic of **Serbia** :

- Territory: 88.361 sq.km
- Population:
  - 9,2 mil.
  - 7,5 mil. with 110 inh./sq.km (without Kosovo)
- Capital: 2 mil. citizens

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Serbian market

GSM operators : 1. MOBTEL (started in 1996)

2. "Telekom Srbija" (started in 1998)

Total mobile subscribers: 3 millions

Total mobile penetration: 40%

Market share: nearly 50/50 %

Internet penetration: 6% with 47 providers ® ***pure fixed lines***

GDP per capita : 2370 USD ® ***developing country***

GDP growth : 3 %

Operator's status

- **MOBTEL**, the Company for Mobile Telecommunications "Serbia" BK-PTT,ltd. operates as a joint-venture company founded in 1994 by :

  1. "BK Trade" (**51**% shares – ***private*** *capital*)
  2. PTT "Srbija" (49 % shares – *state capital*)

- **TELEKOM**, operates as a joint-venture company :

  1. PTT "Srbija" (**80**% shares – ***state*** *capital*)
  2. OTE Greece (20 % shares – *private capital*)

- **TELEKOM** operates as a public fixed network operator as well, with monopoly until Jun, 2005.® ***liberalization !***

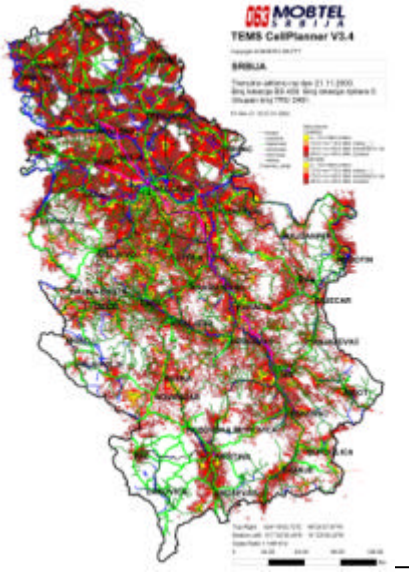
Regulation

- ***Competion*** market is not yet regulated.
- New Telecommunication Law will be put into force in the first half of the ***next year*** *(licenses,interconnection, transparent, objective and no-discriminatory basis, competion, ...).*
- No official anouncement has been issued by the National Authority for the ***IMT-2000 license***.
- IMT-2000 frequency bands are ***occupied*** by other users.

MOBTEL GSM Coverage of the Republic of Serbia Current Status

- territory coverage: ***70%***.
- population coverage: ***94%***.

Need to enlarge coverage !



Key figures for the Mobtel network

- **Standard**: GSM 900/1800, Phase 2+
- **Network size**: 6 MSC+1 TSC, 430 BTS
- **Release**: R9.1
- **GPRS**: in the whole network for post&prepaid; roaming is testing
- **EDGE**: pilot
- **Vendor**: ERICSSON (*NSS, BSS, IN, PPS, WAP, MVPN, GPRS, MMS*)
  Comverse (*SMS, VMS*)
- **Transport** network: MW (*PDH* Ericsson, *SDH* Marconi)
- **VAS**: SMS-email, MMS, Internet, Intranet, GSM Pro, etc.
- **VMNO**: Astra Simit (company as service and applications provider)

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Objectives of Mobtel's Business in 2003

- **Subscribers**: 1,6 millions (Post/PrePaid = 20%/80%)
  with 22% penetration growth
- **Service** monthly usage: 150 min/postpaid customers
  25 min/prepaid customers

- **SMS** monthly : 90 millions messages
- SMS in bussy hour: 230k BHSM

- **ARPU**: 20 USD per postpaid customers

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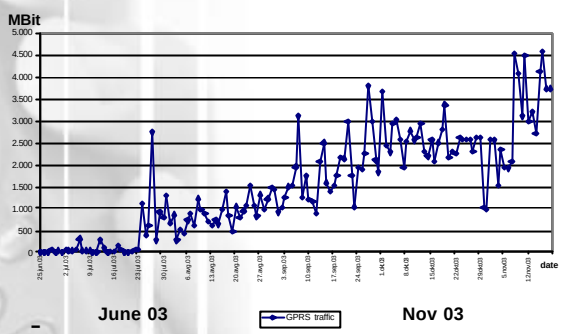
GPRS TRAFFIC



June 03 – start

Nov 03

- 65.000 users (13.000 instant.)
- 40 KB/user
- BH around 24h

Mostly are for WAP !

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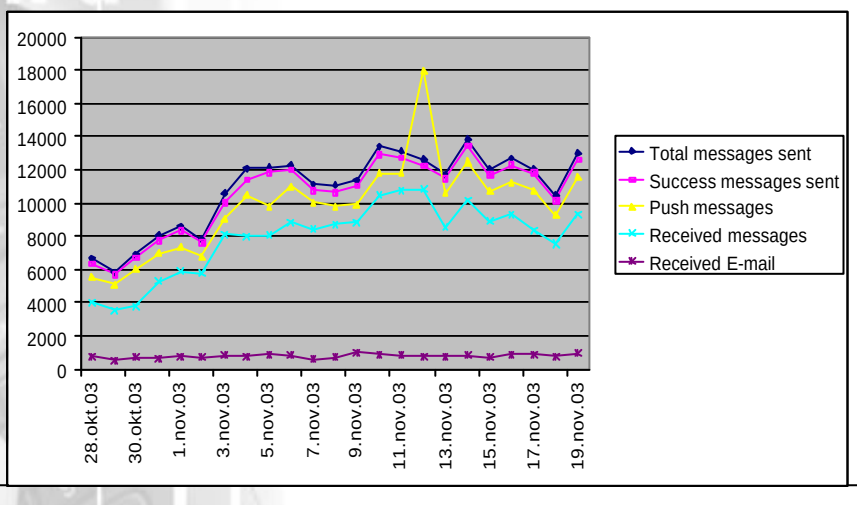
Multimedia messages in Nov. 03



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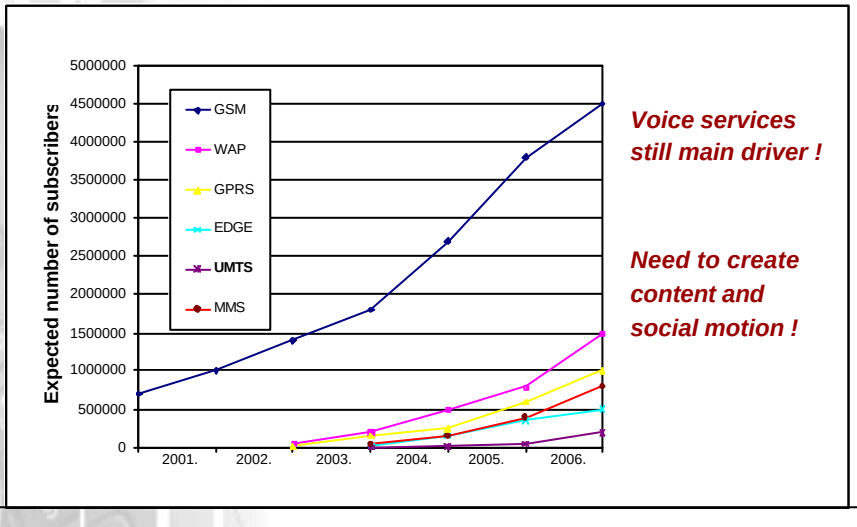
MULTIMEDIA SERVICES

- *It takes time to build markets !*
- *40% are for video*
- *20% are for shoping*

VIVO *FOR ALL*
VIVO *MMS*
VIVO *ENTERTAINMENT*
VIVO *PROMOTION*

Projected Mobtel's growth through the year 2006



Voice services still main driver !

Need to create content and social motion !

Releases

- Due to ongoing standardization work specifications for GSM were grouped into "***Releases***" enabled industry to proceed with the development including ***monstrous SW*** !
- Operators have been forced to implement all enhancements generally ***annuel*** introducing numerous new features and technological improvements.
- Similarly operators could expect this ***gradual*** process will continue, opening the path for the migration to 3G services.

Consideration

- Operators should set requirements and overall strategy for clear objectives that meet *market's* need.
- The debate over 3G migration procedures could be described as *economical* matter and users need for new *applications*.
- There are real concerns that ***wrong choice*** will lead operators in the developing countries to *costs to high* comparing to the investment in building a network expansion and delivering innovated services to 2G customers.

Models for 3G transition strategy

GSM operators could concern several models to decide on 3G transition strategy :

1. Continue building out the existing GSM/GPRS network to launch 3G data servicies with the EDGE upgrading and ***postpone*** the deployment of the 3G network for the later stage.
2. Continue building out the existing GSM/GPRS network ***improving*** quality and capacity and begin in paralel deploying 3G network only in *urban areas* for high-end-users.
3. ***Immediately*** start to deploy 3G network nationwide for the high-end data services.

Analysing the factors involved in technology evolution decision

- Operators are evaluating technology evolution options and determine the best strategy based upon its specific situation and many factors, including :
  - **Spectrum availability**
  - **Subscriber maturity**
  - **Mobile Internet services**
  - **Competition**
  - **Handsets**
  - **Financial situation**

Analysing the factors involved in transition options

- As a GSM operator in the developing country with low economy status and subscriber base still mostly voice-centric, *MOBTEL* has decided to upgrade its network firstly with **EDGE** technology for 3G service implementation.

- EDGE is included as a complement to 3G systems path to provide 3G data services demanding by market in a cost efficient way.

To make a decision rather simple !

- *Gradual investments*
- *Simple service migration*
- *High network infrastructure reusability*

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STRATEGY

- The *MOBTEL*`s strategy is to achieve high-quality GSM and GPRS network with the EDGE system upgrading nationwide and to start with 3G technology at moderate speed starting in major cities with high population at the stage when **3G** frequencies will be available.
- New 3G system requires substantial new investment, since a new Radio Access Network needs to be deployed.
- To make reuse possibility of many of the service network components as well as other peripheral systems.

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3G STANDARDIZATION

- *MOBTEL* has adopted the **UMTS** system with **W-CDMA** as an option of the migration path from GSM to the **3G** system and services providing high capacity link of up to 2 Mbit/s to each user.

- Ability to coexist and interworking UMTS system with the existing GSM/GPRS/EDGE network should be the ***right choice*** to enable seamless functionality between two systems.

- *The decision to evolve from GSM to a seamless GSM/GPRS/EDGE/UMTS network as a migration path is the best solution for our company and our customers.*

Service development in Phases

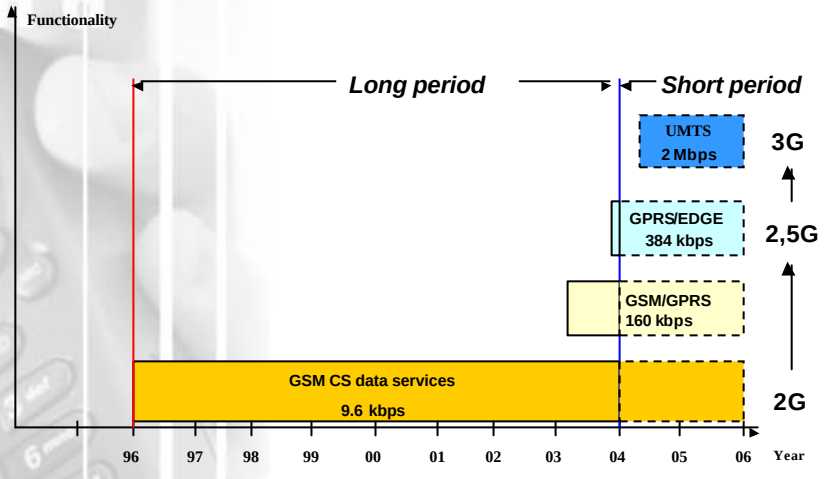
MOBTEL as a 2,5G operator, have recognized three distinct phases in the evolution towards 3G services as the market evolves. According to Ericsson`s White Paper :

- *Phase I* – voice centric
- *Phase II* – high speed data and mobile Internet
- *Phase III* – high speed multimedia and maturing mobile Internet

Choosing WCDMA deployment at moderate speed *MOBTEL* will remain in *Phase I* and *Phase II* for a longer period to continue with coverage and capacity expansion, and then slowly enter in *Phase III*.

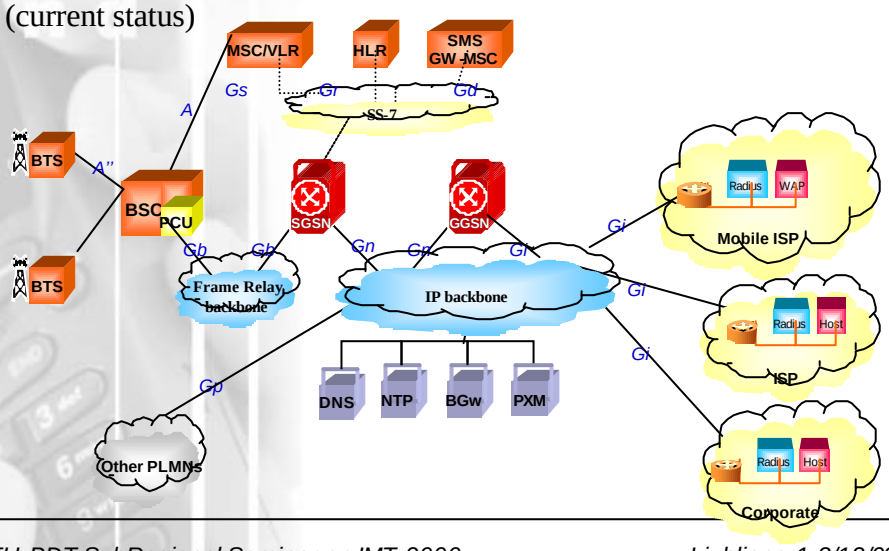
In our case study I think 2G will be for a long time to fill the gaps for where we have not really got 3G coverage.

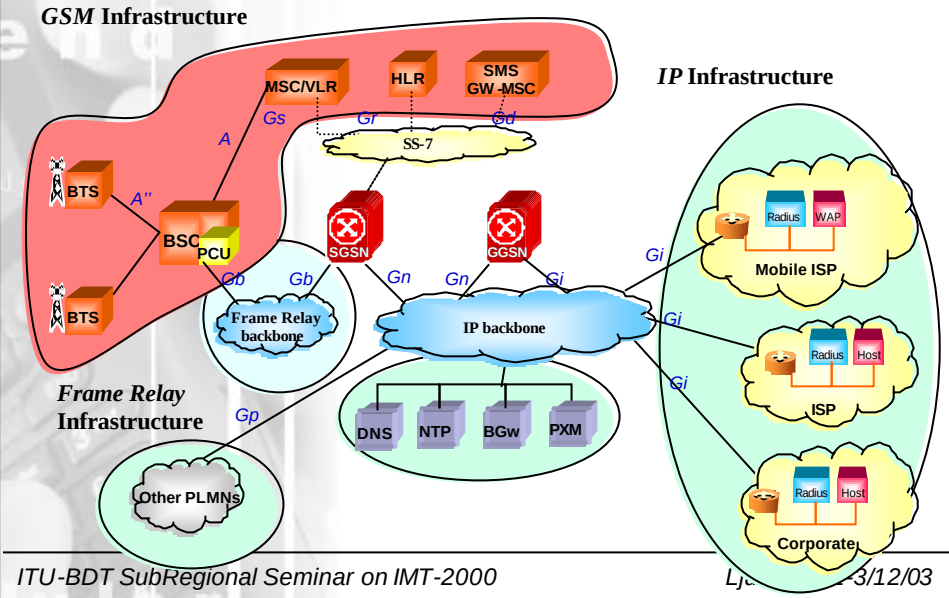
Data service evolution in Mobtel network



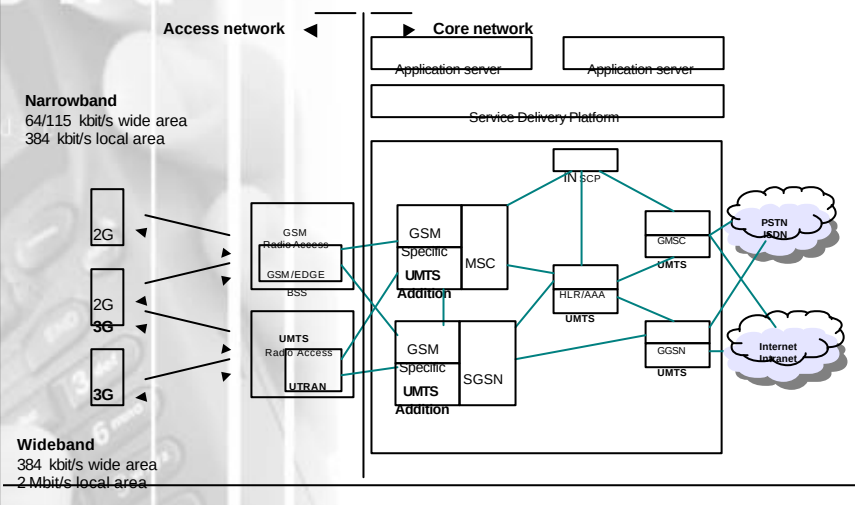
® Mobtel GPRS network currently support 48 kBit/s, based on QoS

GSM/GPRS Architecture
(current status)





EVOLUTION to UMTS in GSM/GPRS/EDGE environment
- The most cost-effective option -



CONCLUSION

- ECONOMIC ASPECTS WITH THE **COSTS** OF THE POSSIBLE OPTIONS.
- MINIMIZE THE COSTS OF MANAGING EXISTING **2G** AND A NEW **3G** NETWORK.
- **COEXIST** AND **SHARE** THE SAME INFRASTRUCTURE.
- **MARKET** DEVELOPMENT FOR *MOBILE* DATA AND INTERNET.
- DEVELOPMENT OF IP-BASED MMS.

FAQ: Still many questions about 3G ®

FAQ

We have still many questions about real life experience in implementing 2G(GSM) / 3G/UMTS seamless network:

- How much will it cost ?
- How will make it work efficiently ?
- What benefits will we get from it ?
- Coexistance between GSM and UMTS ?
- Possible network architecture ?
- Interworking approaches ?
- What parts of GSM core infrastructure can be used for UMTS core network ?
- Understanding tha phasing of the core network ?
- Functionality within UMTS interfaces and UTRAN protocols ?
- Comparison of GSM/UMTS coverage ?
- Planning the UMTS radio network design ?
- What are the security of the UMTS SIM ?
- Users experience in handover or roaming between 2G and 3G network ?

Equipment manufacturers will need to offer complex handsets in time !

Thank You!

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