

Status Report on the Serbian Mobile Communications

MOBTEL GSM/GPRS Network Overview

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Director of Development Department

- The Federal Republic of Yugoslavia is located on the Balkan.

- The Republic of Serbia extends to 88.361km² with population of 9.779.000 inhabitants (*110 inh/km²*).

- The Republic of Montenegro extends to 13.812km² with population of 615.000 inhabitants (*44 inh/ km²*).



GSM OPERATORS IN Federal Republic of Yugoslavia

Republic of Serbia:

- MOBTEL –
Mobile Telecommunications “Srbija”, BK-PTT
- “Telekom Srbija”

Republic of Montenegro:

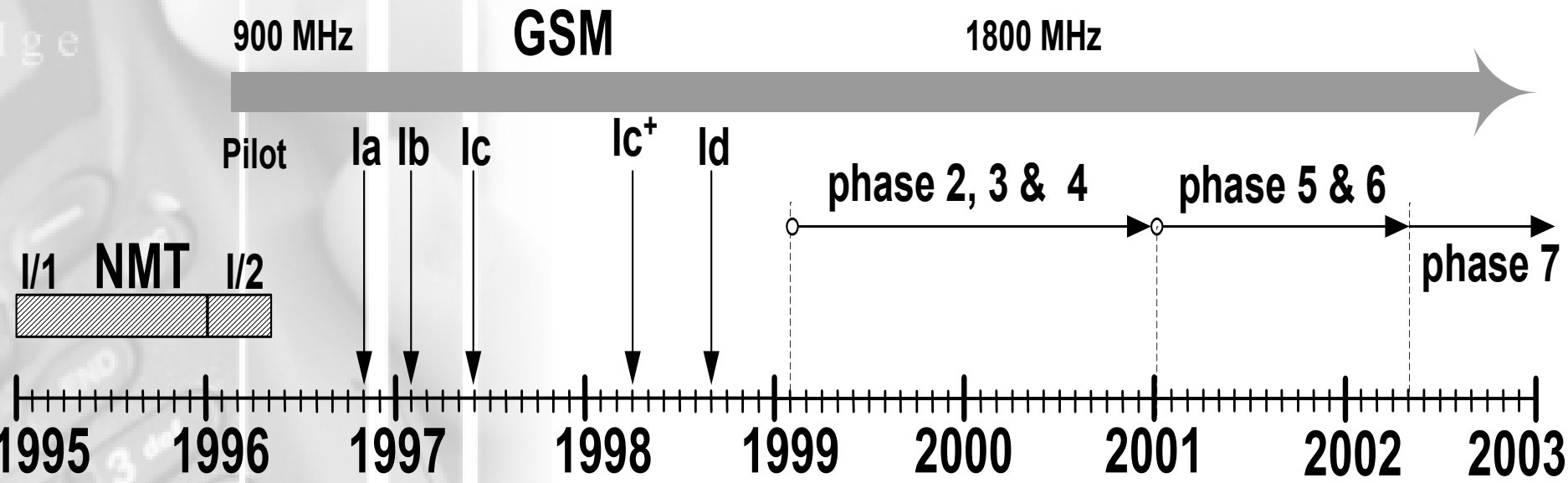
- ProMonte GSM
- Monet

Current Status

- The Company for Mobile Telecommunications “Serbia” BK-PTT operates as a Limited Liability Company with its Headquarters in Belgrade.
- MOBTEL is joint-venture company founded in 1994 by :
 - 1) “BK Trade” from Moscow (51% shares - *private*)
 - 2) Public Enterprise for PTT Services “Srbija” from Belgrade (49 % shares - *state*).
- The Quality Management System of MOBTEL has been approved in 2000 by Lloyd’s Register Quality Assurance according to the ISO 9001 Standard.

NMT-900 and GSM-900/1800

Network Evolution



NMT-900 and GSM-900/1800

Spectrum Planning

- Available bandwidth for MOBTEL networks:

NMT-900 : 2 x 3.8 MHz

GSM-900 : 2 x 9.6 MHz

GSM-1800 : 2 x 20 MHz

UMTS : not available

- Fees are based on each Tx/Rx frequency operating on the particular base radio-station (10 years period), without initial down-payment for the available bandwidth.

NMT-900 Network – Current Status

- MOBTEL NMT Network covers **9%** of the territory and **50%** of the population of the Republic of Serbia.
- Installed capacity of the NMT Mobile Exchange is for the ~11.000 subscribers.
- Installed capacity of the NMT Radio Network is for the ~10.000 subscribers.

GSM Network Current Status

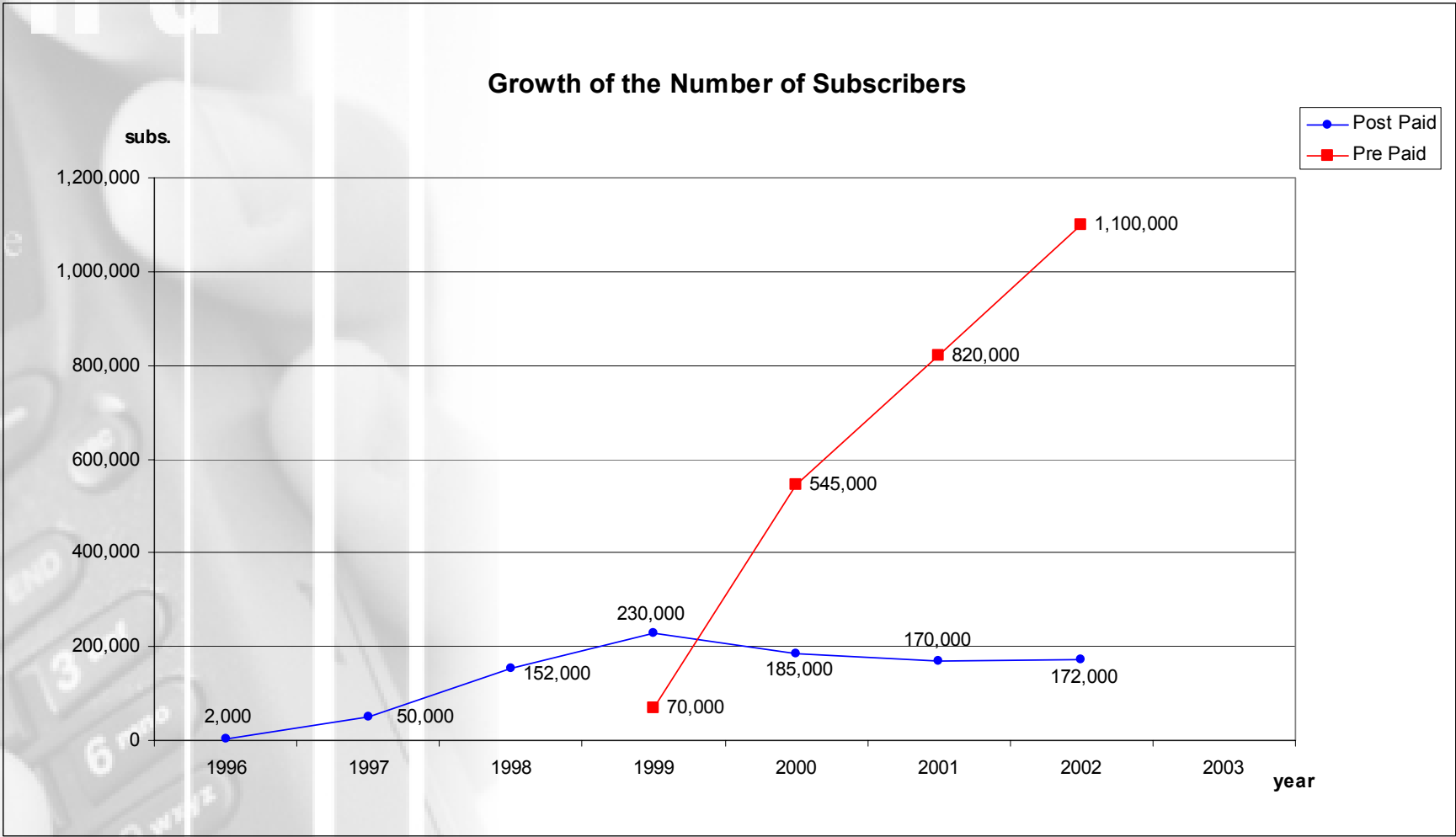
- Number of subscribers, post and pre-paid: **1.300.000**; 85% pre-paid subscribers, 15% post-paid subscribers.
- Percentage of territory coverage: **70%**.
- Percentage of population coverage: over **94%**.
- Vendor of GSM System: **Ericsson**.
- Producer of the equipment:

Switching	: Ericsson
PrePaid	: Ericsson, Sema
IN	: Ericsson
SMS	: Comverse
VMS	: MXE/Ericsson
GPRS	: Ericsson,
MPS	: Ericsson
Base Stations	: Ericsson
MW (PDH), DXX	: Ericsson
MW (SDH), Flex-Plex	: Marconi (Bosch)
IT	: Compaq, Delta, Cisco

GSM Network Current Status

- Services in operation: all GSM **Phase 2** and partly **Phase 2+** services (wap, pre-paid roaming terminating, intern. roaming, sms, sms to e-mail, vms, conference call...)

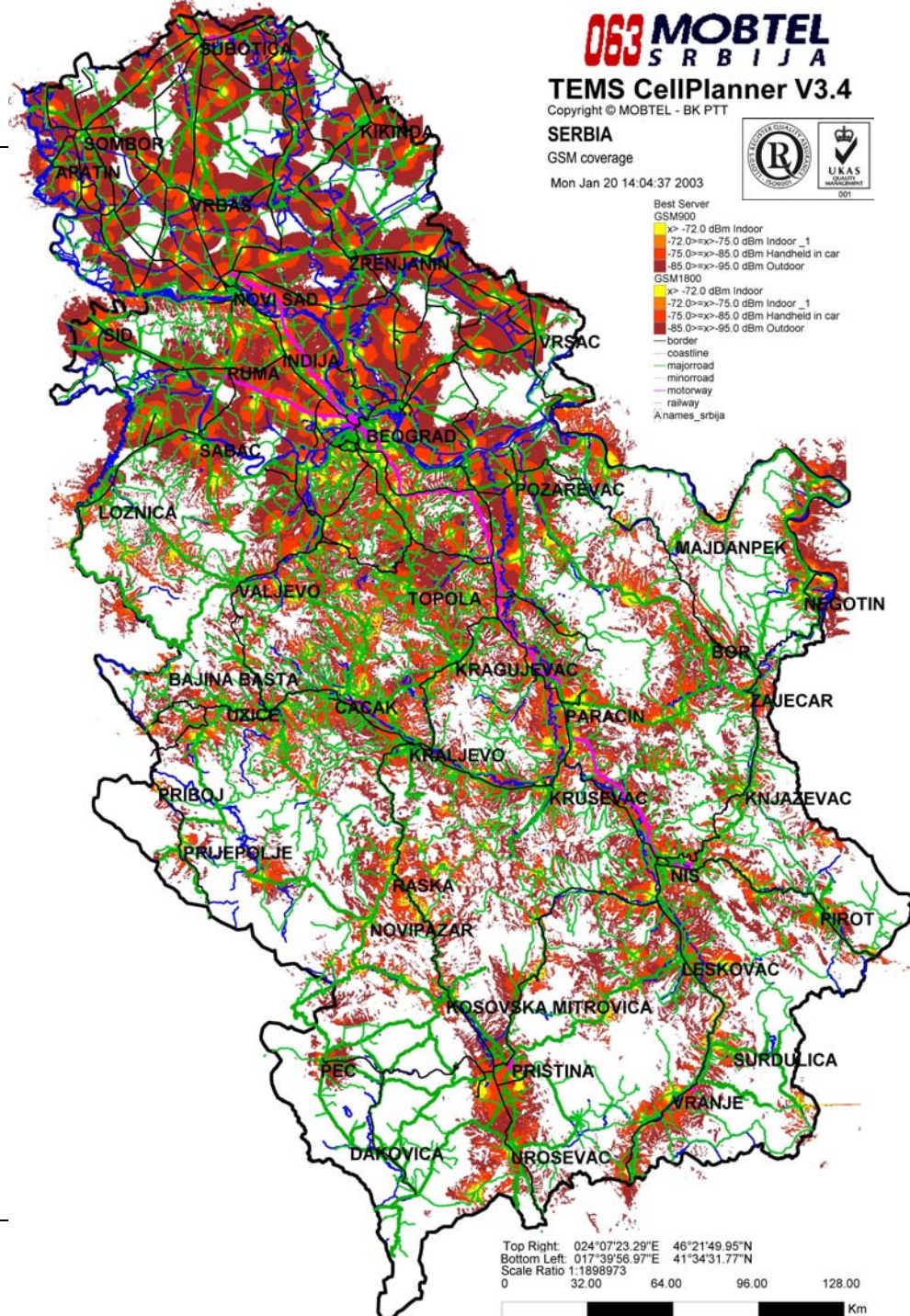
Growth of the number of Subscribers



GSM Network Current Status

Number of Switching Centers + Transit Exchange	Number of Radio Base Stations 900/1800	Number of Radio-Relay Hops
<p>6 + 1</p> <ul style="list-style-type: none"> ▪ at 5 sites ▪ in 4 cities 	<p>358</p> <ul style="list-style-type: none"> ▪ 90% macro <ul style="list-style-type: none"> 55% indoor 35% outdoor ▪ 10% micro ▪ FH (baseband and synthesized) <ul style="list-style-type: none"> ▪ A5/1 ▪ FR and HR 	<p>394 mini link hops</p> <ul style="list-style-type: none"> ▪ 4, 8, 16 and 34 Mbit/s ▪ 7, 15, 23 and 26 GHz ▪ (1 + 0) <hr/> <p>20 backbone hops</p> <ul style="list-style-type: none"> ▪ 155 Mbit/s ▪ 6, 13 and 23 GHz ▪ (1 + 1) and (2 + 1)

MOBTEL GSM Coverage of The Republic of Serbia Current Status



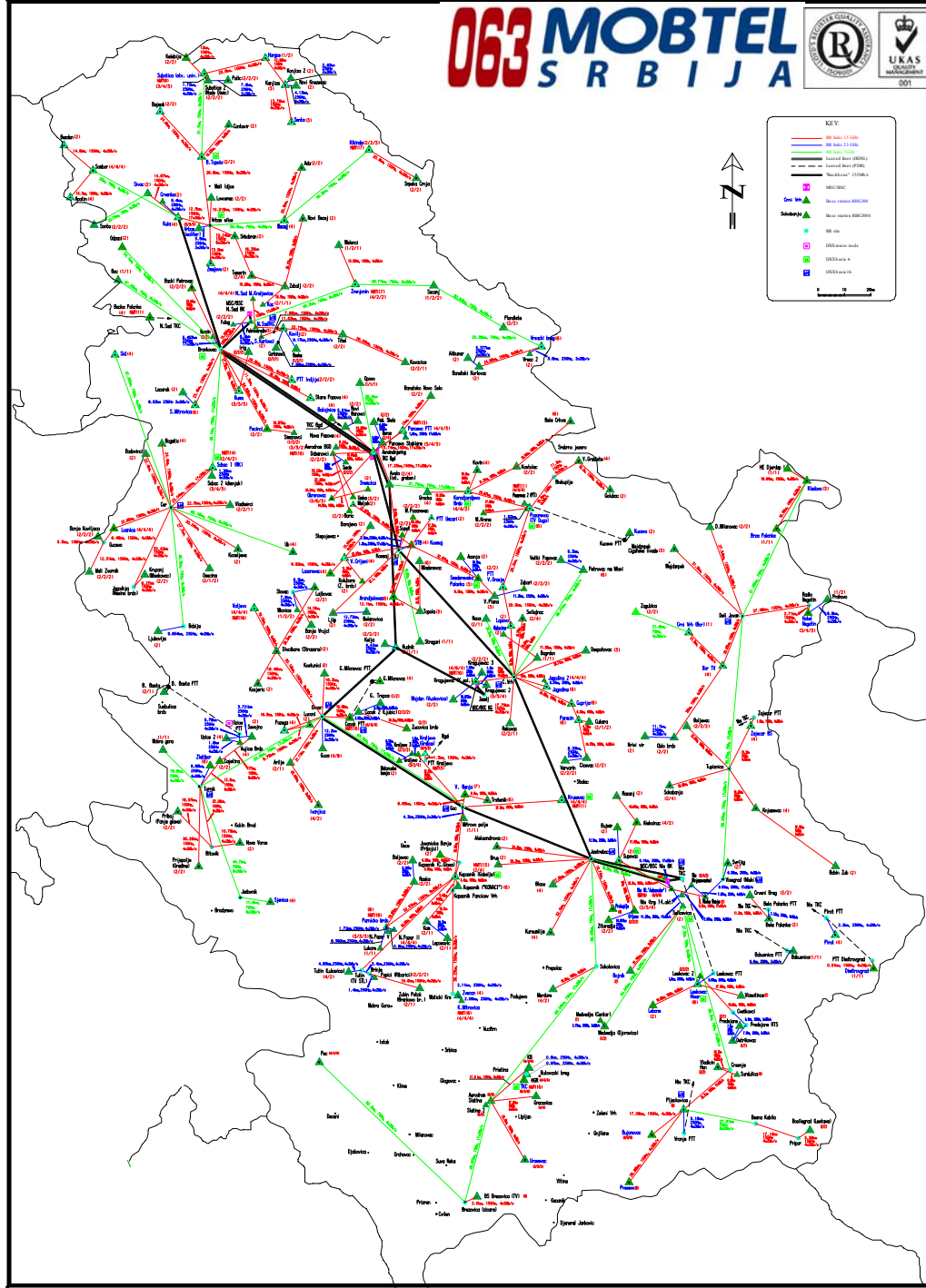
GSM MOBTEL COVERAGE	
January 22nd, 2003.	
Population coverage	94%
Area coverage	70%
Highway coverage	100%
Main road coverage	65%
Railway coverage	73%

Percentage of covered territory			
Level of signal	> -72dBm	> -85dBm	> -95dBm
% of territory	13	35	52

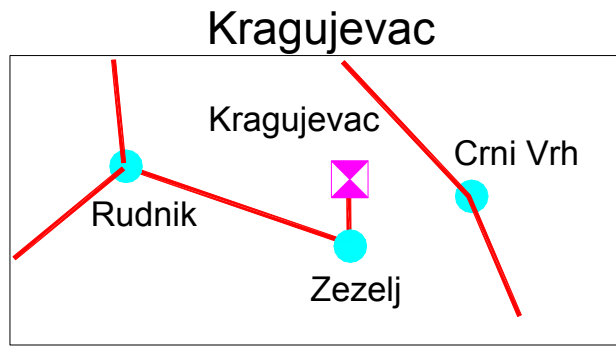
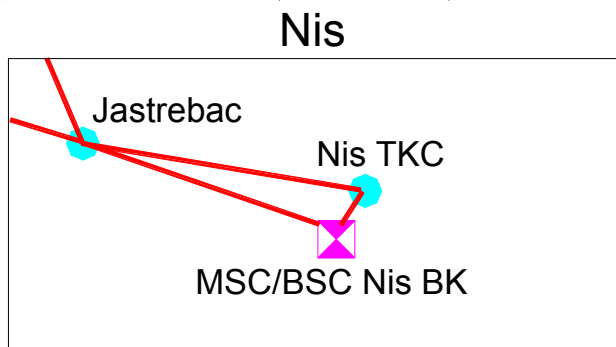
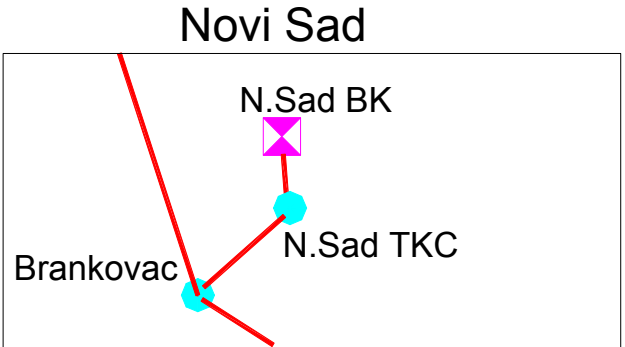
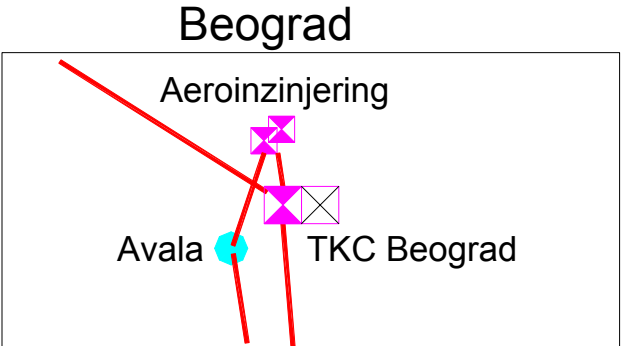
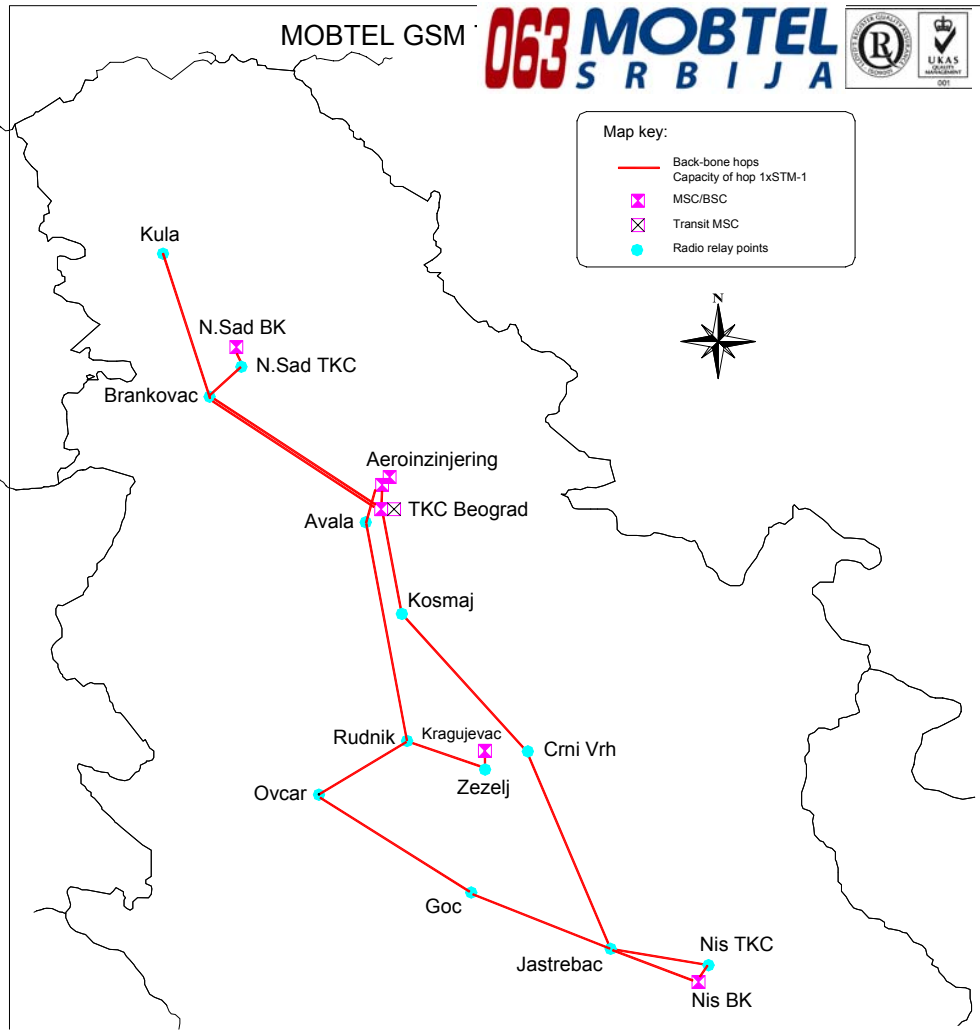
MOBTEL GSM Network Overview

Current Status

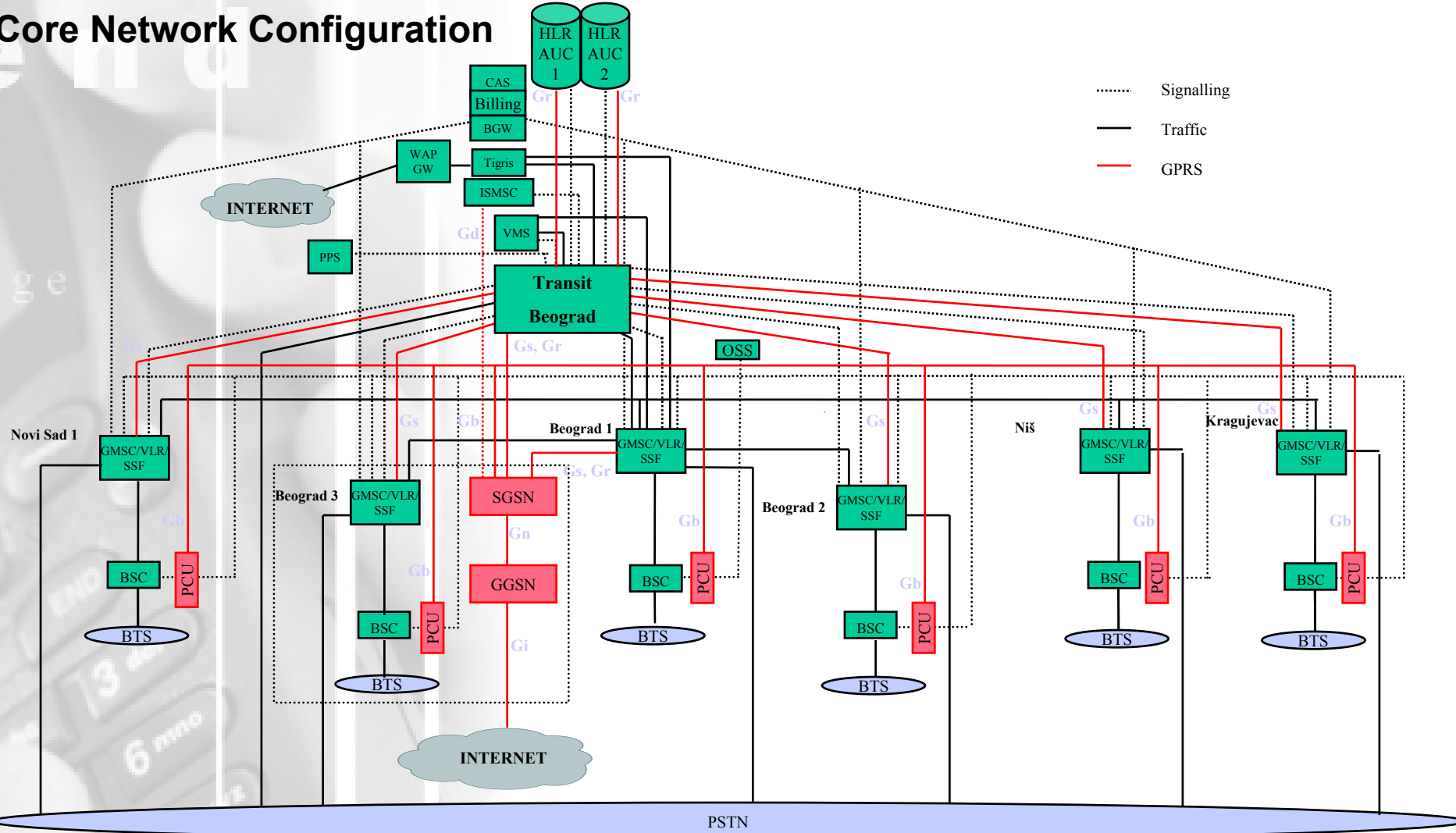
Serbia



MOBTEL Backbone Transmission Network Current Status

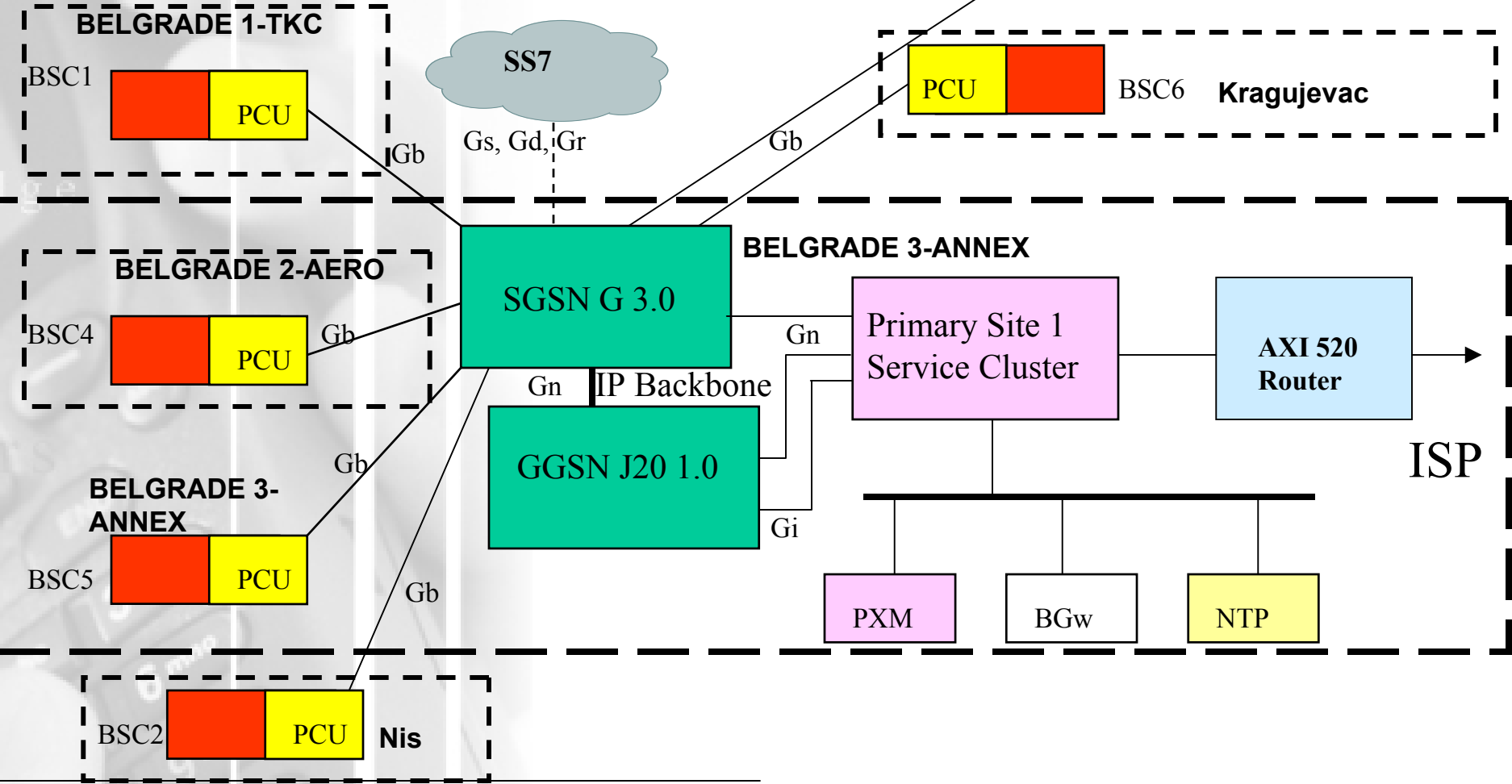


MOBTEL GSM/GPRS Core Network Configuration



MOBTEL GPRS Network (SGSN&GGSN)

Ericsson Design



Traffic level per user in busy hour

Cell Category	Average traffic per user in BH (mErl)	Percentage of users
Urban (Belgrade)	15	15%
City Suburban (BG, NS, NI, KG)	12	22%
Suburban (country)	9	45%
Rural (country)	7	18%

Throughput requirement for GPRS users = ?

SMS Traffic Current Status

24/01/03

- 1.600.000 SM per day (charged)
- 180.000 BHSM
- 300.000 BHSM licence

Primary Objectives of MOBTEL Business Policy in 2003

- To increase number of subscribers to **1.7 million users**.
- To extend the GSM network coverage to **85%** of the territory.
- To increase the post-paid and pre-paid market penetration.
- To increase number of post-paid subscribers for additional **110.000 new customers**.
- To increase number of pre-paid subscribers for additional **440.000 new customers**.
- To increase monthly usage to the level of **130 minutes** per customer in the post-paid, and **35 minutes** in the pre-paid.

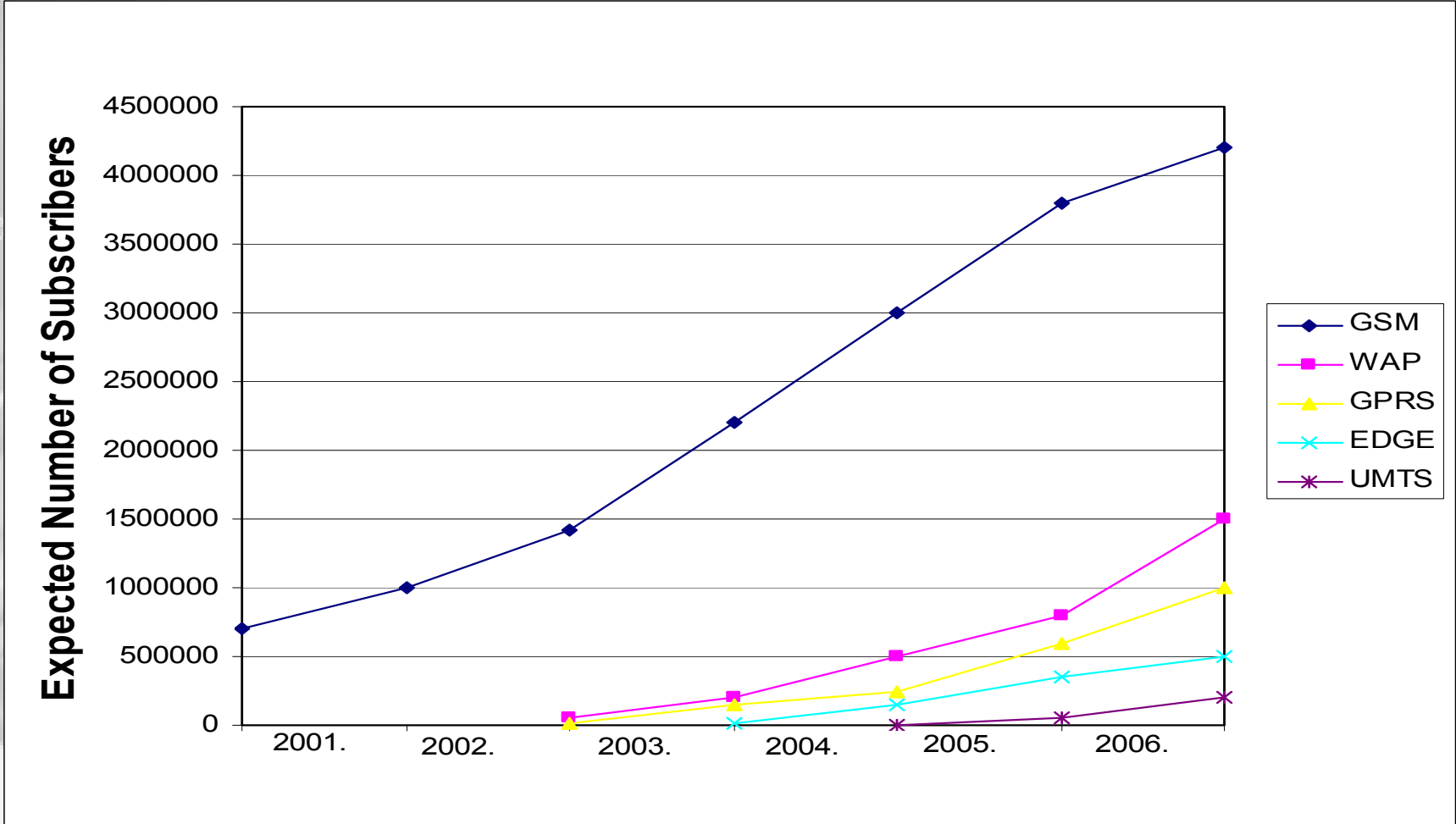
Primary Objectives of MOBTEL Business Policy in 2003

- To increase the number of satisfied customers with respect to:
 - Improvement of ***service quality***
 - Enlargement of the ***number of services***
 - Enlargement of the ***network capacity***
 - GSM signal ***coverage and quality***
 - Achieving ***roaming with ~ 200 GSM mobile operators.***

New Services Towards 3G *supported by ERICSSON*

- The High-Speed Data Transmission (**GPRS**)
- The GSM Pro System (**GSM professional**)
- The Mobile Virtual Private Networks (**MVPN**)
- The Mobile Positioning System (**MPS**)
- The Multimedia Messaging System (**MMS**)
- New Roaming Services. Preliminary contracts with GPRS and UMTS operators in order to provide the **GSM/GPRS - UMTS compatibility and Dual-Mode/Band operation.**

Projected Growth through the year 2006



Developing Strategy

	2001	2002	2003	2004	2005	2006
Number of customers planned	1 mil	1,3 mil	1,7 mil	3 mil	3,9 mil	4,2 mil
Dual-band operation	900/1800					
New HW/SW Versions of the Pre-Paid systems	PrePaid Strong	upgrade	upgrade	upgrade	upgrade	upgrade
Access to the Internet and Intranet	WAP	upgrade	upgrade	upgrade	upgrade	upgrade
E-commerce Services	SMS - Email	upgrade	upgrade	upgrade	upgrade	upgrade
High-Speed Data Transmission		GPRS	upgrade	upgrade	upgrade	upgrade
Functional systems			GSM Pro	upgrade	upgrade	upgrade
Virtual Private Networks in GSM an with PSTN			VPN	upgrade	upgrade	upgrade
High-Speed Data Transmission				EDGE	upgrade	upgrade
UMTS Experimental Operation					UMTS	upgrade
UMTS Commercial Operation						UMTS

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- UMTS licenses are not yet issued!
- New Telecommunications Law will be put into force approx in the first half of this year!

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Thank You!

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Status Report on the Serbian Mobile Communications

Presentation of MOBTEL Company

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