



Bridging the Digital Divide Using IMT-2000 to provide Universal Access to Telecom Services

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Damascus, June 13-15 2005**



3G CDMA – Satisfying the demand for Wireless Voice and Broadband today!

Toll-quality Voice communications (equal or better than landline)

High-speed Data transmissions (multiples greater than ISDN speeds)

Secure transmissions (including DRM, anti-spam, fraud control, etc.)

Excellent coverage (with in-building, multimode & robust hand-off services)

Commercially available devices (more than 750 devices from 60 vendors)

- *Small and attractive form factors*
- *Data-enabled devices based on IEEE (TCP/IP) standards*
- *Operating systems based on "open" execution environment standards*
- *Low battery power consumption*

Commercial-grade infrastructure (switching, billing, authentication, etc.)

Thousands of applications (multimedia, multi-casting, messaging, etc.)

Low cost per minute, megabyte or message (due to spectral efficiency)

More than 160 million paying subscribers worldwide and growing (~4M/mo)!

Connecting Citizens Around the World



3G is playing an important role in bridging the digital divide

Around the world, mobile phone users are overtaking fixed-line subscribers due to the affordable high-quality voice and data services that are made possible by today's technologies. The number of wireless-only homes is growing and there are far more mobile phones than PCs in the world.

3G CDMA networks foster various levels of global connectivity – from wireless local loop to high-speed mobile voice and/or data in many different licensed frequency bands.

3G CDMA enables high-quality voice, wireless broadband access and a variety of multimedia applications making telemedicine, public safety, education, business and entertainment a reality everywhere.

Theoretical Cell Sizes (Voice)



Reverse link dominates coverage:

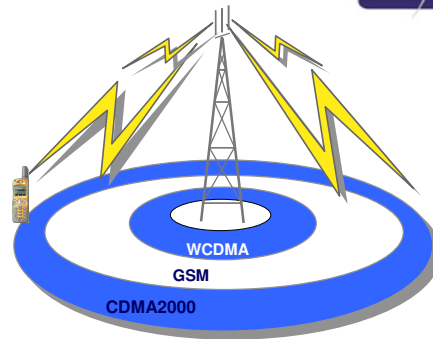
- Limiting link due to several issues

Link budget determines available margin required to achieve a high quality link

- Easy to compare technologies

Difference in coverage is affected by a variety of factors, including:

- Morphology
- Tower height
- H/W and rate set assumptions, etc.



	Freq. (MHz)	Radius (km)	Area (km ²)	BTS Count
WCDMA	2100	13.3	553	13.6
GSM	900	26.9	2269	3.3
CDMA2000	800	29.4	2712	2.8

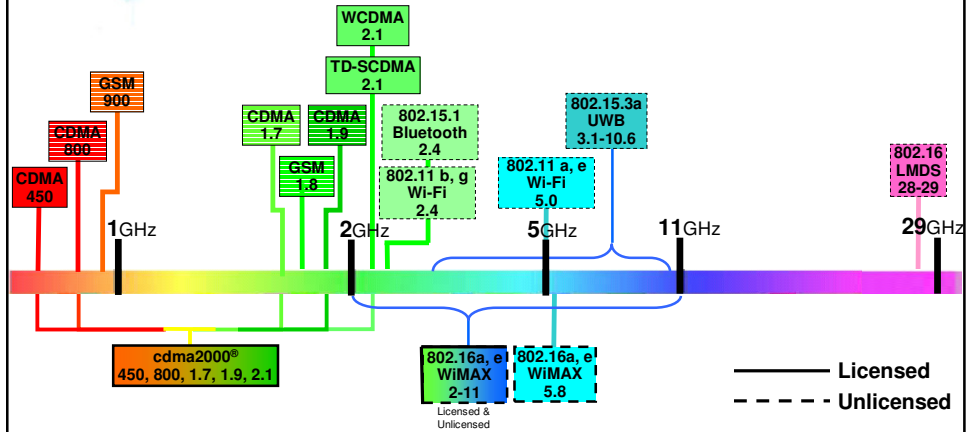
Lower Frequencies Provide Greater Coverage and Reduce Base Stations

Source: Lucent Technologies. Note: This is a simplistic estimation that real-world terrain and environmental variables will affect. It assumes all parameters are equal: terrain, output power, antenna height, etc.

Spectrum Allocations

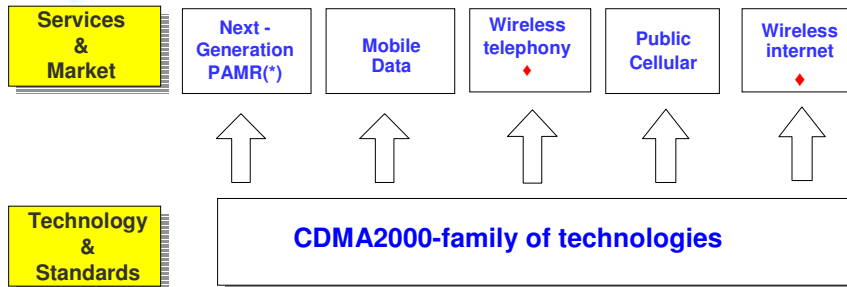


Providing affordable coverage is crucial in wireless telecommunications.
The warmer (lower) frequencies are best!



Licensed Spectrum vs Unlicensed Spectrum
The use of unlicensed spectrum creates interference issues

CDMA provides a platform for a number of services



*PAMR - Private Access Mobile Radio

- High Spectrum Efficiency
- Maximum site capacity use
- Ubiquitous coverage
- Efficient data transmission
- Lowest cost per Mbs

3G CDMA for African Development



Large voice telephony market will continue to be serviced by 2G GSM

Two new additional markets to be serviced by 3G CDMA:

- – Low Cost Voice Telephony:
 - Opportunity afforded by spectral efficiency and capacity of 3G CDMA
 - Spectral efficiency can lead to reduced costs per subscriber. (Notable Example: India)
 - Universal Service Obligations, “Under-Serviced” Areas, Rural Deployments
- – Data Services:
 - Cost effective data services – service comparable to DSL.
 - Very few cost effective wireless alternatives.
 - Residential, small business, corporate and government markets

Challenges for 3G CDMA Africa Development:

- Availability of appropriate spectrum allocations.
- Very low cost voice-centric handsets.

3G CDMA for Universal services



- **Most of the African markets have to mobile operators but:**
 - Universal services are far from being available
 - Universal access for internet is as important as voice
- **CDMA solutions are available at different bands and can be installed as complement of existing networks and are able to provide a short time to brake-even**
- **New full IP configuration allow lower operating cost and localized coverage with a national network**
- **Wireless internet is a integral part of a network providing several services**
- **Migration to Rel. A allow a long term growth capability**

3G is fulfilling Universal Service Obligations



Connecting Citizens to voice & Internet services

Rainbow Chalta Firta PCO

In **India**, Reliance will meet universal service obligations by providing 3G service to 48,310 villages that don't have public phone facilities¹

In **India**, Shyam Telecom has equipped a fleet of around 200 self-employed rickshaw drivers with a mobile calling office, including fax²



In the **Dominican Republic**, Tricom deployed over 1,700 public pay phones in underserved rural areas. These phones will eventually be used for high-speed Internet access³



In **Brazil**, Anatel & Lucent provided universal broadband (800 kbps @ 45 km) access with 3G

In **Ecuador**, Edumasters installed 3G kiosks at several public schools to provide free Internet access. Panama is next.⁴



In **Chile**, BellSouth provided 3G broadband access to 667 schools nationwide⁵

1. <http://www.thehindubusinessline.com/2004/09/20/stories/2004092002090100.htm>
2. <http://www.hellorainbow.com/aboutus.asp>
3. BNAmericas.com, "GEC-Tel, Tricom Partner for wireless Network – Dominican Republic, November 20th, 2004
4. <http://projetoscd.isat.com.br>
5. www.edumasters.net
6. http://www.subtel.cl/servlet/page?_pageid=57&_dad=portal30&_schema=PORTAL30&p_language=e, Sept. 3, 2003

3G is fulfilling Public Safety Initiatives

Protecting & Saving Lives



In the **U.S.**, 3G carriers offer E911 services with accurate (5-30m) position location capabilities¹

In **Japan**, SECOM launched a nationwide location-based security service²

In **China**, Unicom donated 150 kid tracker devices to the Beijing School of the Blind³

In **Korea**, SKT and National Police Agency introduced a Missing Children Service⁴

In **Canada**, the Ontario Police quickly access vital information (including fingerprints IDs) and respond to emergencies instantly with position location dispatch⁵

In **Florida**, the Broward County Sheriff's Office uses 3G for child protection services⁵

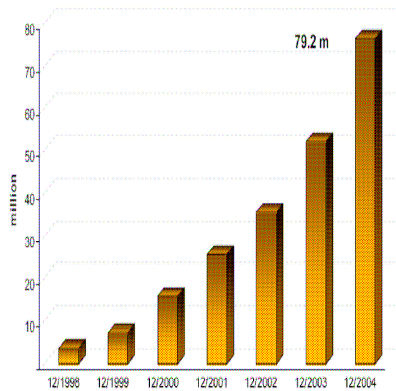


1. www.fcc.gov/911/enhanced/
2. www.secom.co.jp
3. www.chinaunicom.com.hk
4. www.cnn.com, Friday October 1st, 2004
5. CDMA A-List Award Winners

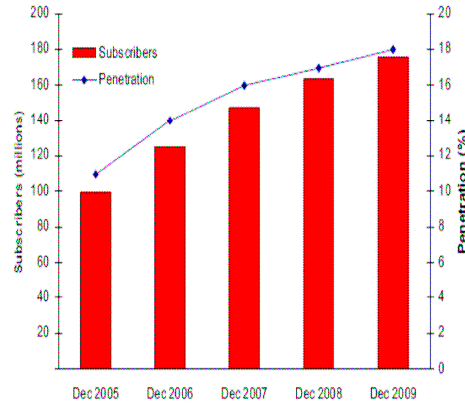
Africa Telephony Market Growth



Actuals 1998-2004, and Forecast 2005 – 2009

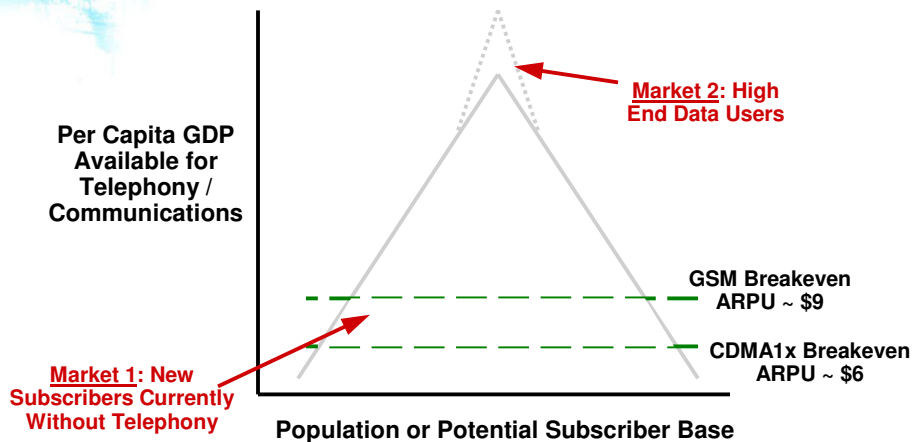


Source: World Cellular Information Service



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African Markets Addressed with CDMA2000

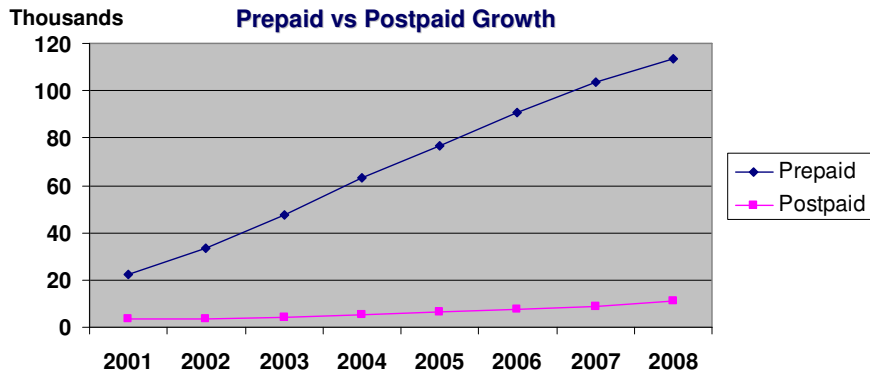


Market Trends in Africa



Explosive prepaid growth will dominate for the coming years

- Rapid growth in Prepaid segment
- Overall effect will be to drop the ARPU in the market



Source: "Global Mobile/Wireless Forecast", The Yankee Group, January 2005

The Reliance Impact on the Indian Market for Affordable Telephony



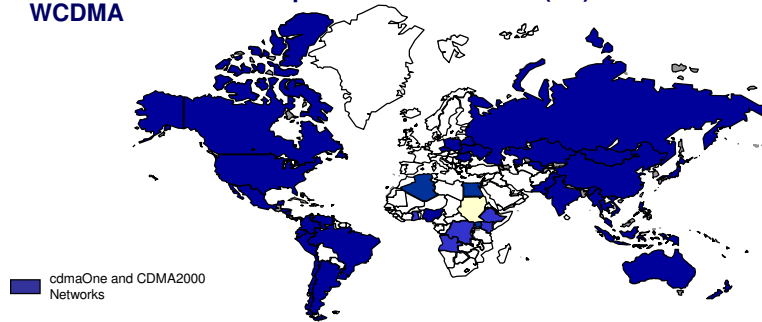
Parameter	Before Reliance	After Reliance
Total no. of mobile phones (Million)	11 mn (Jan '03)	30 mn (Jan '04)
STD rates (Mumbai – Delhi Call Cost)	Rs. 9.60 / min	40 paisa / min (RIM – RIM)
SMS cost	Re 1	Free
Total minutes of use per day	2.2 billion minutes	5.7 billion minutes
Min Cost of Data Services like: news, games on mobile	750	Free
Entry Cost for going mobile (handset upfront cost+ activation charges + security deposit)	> Rs. 5000	Rs. 501

Source: Reliance Infocomm

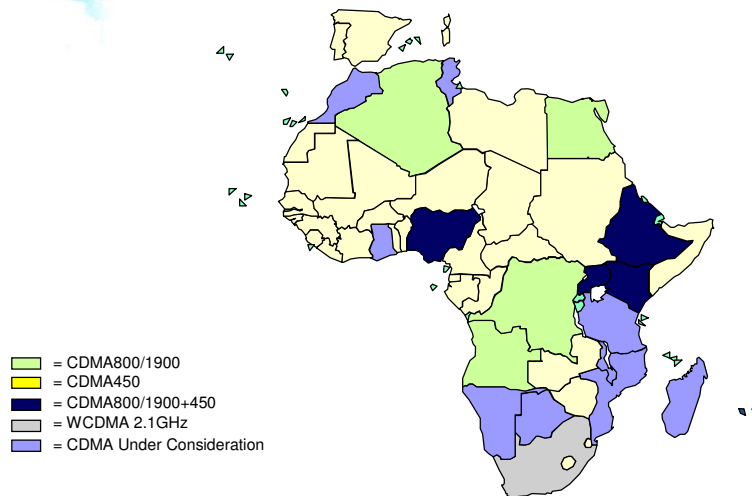
CDMA Worldwide



- **Rapidly expanding: 260 networks on six continents**
 - North America: Dominant technology with 47% market share
 - Latin America: 25% market share and 39 operators in 20 countries
 - Asia: Largest market for CDMA and rapidly expanding in China and India
 - Africa and Middle East: Emerging markets for CDMA2000 and CDMA450
 - Europe: Emerging market for CDMA450
- **The fastest-growing technology worldwide: 240 million users**
- **CDMA is the dominant platform for IMT-2000 (3G): CDMA2000® and WCDMA**



CDMA Status in Africa



Conclusions: Road-Mapping of 3G CDMA in Africa



The Future is both Voice and Data. Africa needs both to provide universal services.

“Warmer Frequency” (800 and 450 MHz) spectrum provides best geographic coverage and economic alternatives.

Thank you