ITU-BDT Regional Seminar on
IMT-2000 for the Arab Region

"Mobile GSM/UMTS networks: a Universal Communication and Services solution"

DOHA IMT2000 30/09/2003
Roland THIES

Presentation Outline

> **The Operator Opportunities**

> Alcatel GSM Local Loop Package

> Regulation Aspects

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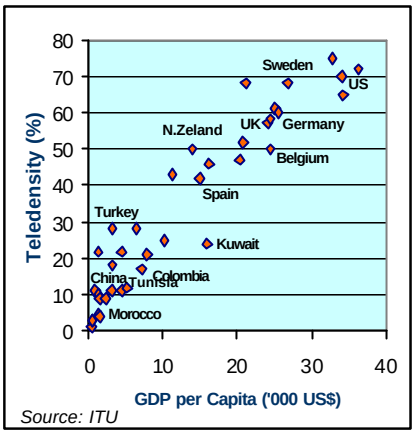
Developing Country Challenge: **Access to Information**

- **How Teledensity and economic growth are linked together?**
  - A key issue for economic and social development?
  - … to be urgently addressed, especially in rural (isolated) areas?
- **What kind of services?**
  - Telephone, Internet, …
  - Individual or community access
  - Prerequisites



Source: ITU

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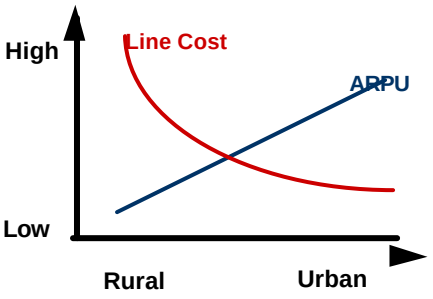
Universal Access to Telecom services

The famous dilemma!



How to take up the challenge?
- "Dream solution" for Rural Telephony
- dedicated subsidies
- obligation of services (incumbent operator)

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Rural Telecom is not as unprofitable as … it is said !

- **Incoming call revenues** are not taking into consideration in the business model
- **Profitability issue must be reconsidered**, taking advantage of potential service Internet revenues
- **Population solvency** is much better than foreseen
  - Community Access, Prepaid will improve population solvency
  - Real population income is much higher than GDP (--> PPP)

Still operator approach is ….

- **too much individual access oriented**
- **forgetting Internet opportunities**

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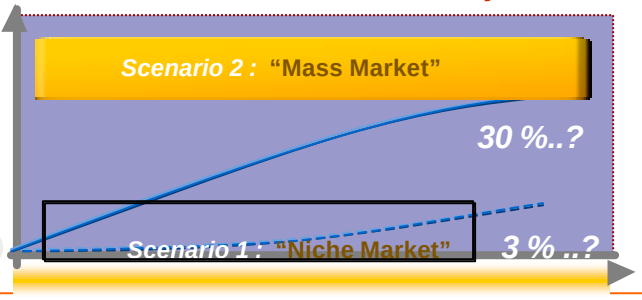
Internet can leapfrog development, if ...

INTERNET, as Public Utility

Internet is seen as a prime Communication Tool offering useful end-user services based on local content via Community Access

Internet Penetration



… to Reinvent Internet Usage !

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A “virtual” market place

Professional Tool to manage Food price on real time

The cost of the service is quickly paid back by the increase of producers’ margins

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Access Network Technologies

Use standard widespread technologies in innovative arrangements

- Fixed or Mobile
  - Wireline or Wireless
    - Narrowband or Broadband
      - Voice or Data

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GSM Solutions with Restricted Mobility
A Key Opportunity for Carriers

Deregulation
Removing last barriers to global competition

Operators looking for new opportunities:
Attract new subscribers

GSM solutions with restricted mobility

End-users' demand
Universal Access:
Fixed telephony for "moving" people
Community Internet Access

GSM global reach
Large deployment & roaming
Economy of scale & flexibility of deployment

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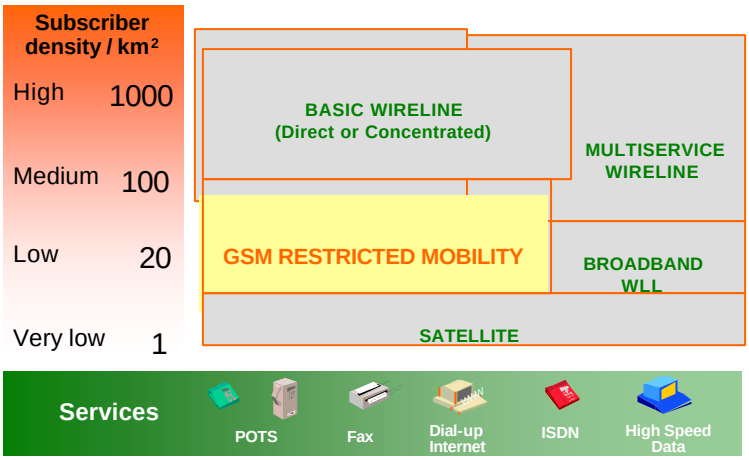
The Solution for medium and low density Access



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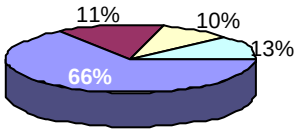
Why GSM technology in the Local Loop?

Advantages over other wireless technologies



GSM: 66% of the world mobile market

- GSM
- CDMA One
- TDMA
- PDC and others

- the most wide-spread technology
- the solution to reduce operational costs
- the Data inside capability
- the SIM concept
- the larger coverage
- the failure of previous WLL technologies

Allows the restricted mobility solution

Source: EMC, August 2001

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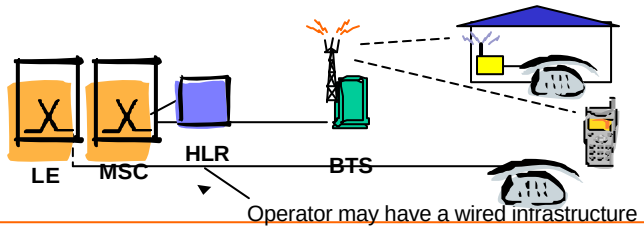
Scenario n°1: Fixed Operator

Incumbent Fixed operator deploying a GSM Local Loop network

- **For rural and suburban areas**, wireless solutions are less costly than wired when subscribers are spread
- **Quick deployment** and easy installation
- **Capacity to evolve to a full mobile solution Pre-paid** (public phones & mobile pre-paid) for all users through the same IN platform



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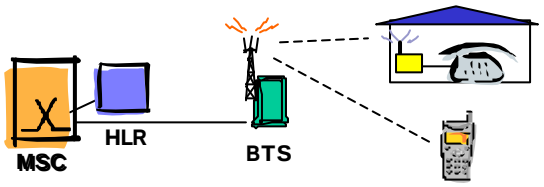
Scenario n°2: Mobile Operator

Mobile operator starting to provide GSM restricted mobility services

> The **mixed GSM fixed/mobile solution** has synergies like:
- Very limited investments: **infrastructure is shared**
- Increase revenues: by doing **attractive packaged fixed/mobile rates**
- **Pre-paid (public phones & mobile pre-paid)** for all users through the same IN platform



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The Telephone and Internet in isolated areas

… at affordable costs

- **GSM,** offers phoning with mobility limited to zones with long distance activity.
- **GPRS/WAP**, for access to information individually, or collectively

by extension of the mobile infrastructure (at a marginal cost) with optimised connection solutions :
Cable, broadband radio, microwaves, satellite, ….

The solution for universal access

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Main advantages for End Users

- **Mobility :** “nomadism”
- **Prepaid :** solvency

- **Virtual leased line to access Internet :** cybercafés
- **Mobile platform services :** added revenue

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Main advantages for Operators

- **CAPEX**
  - Extension of existing GSM Network **at marginal cost**
- **OPEX**
  - Neither specific operation, nor maintenance, nor training
  - No “at home” installation
  - No billing, bad debt
- **Revenue**
  - significant growth [thanks to increased user base]
  - added value services [over a unique infrastructure]

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Presentation Outline

- The Operator Opportunities
- **Alcatel GSM Local Loop Package**
  - GSM Local Loop solutions
  - Benefits from Solution advantages
- Regulation issues

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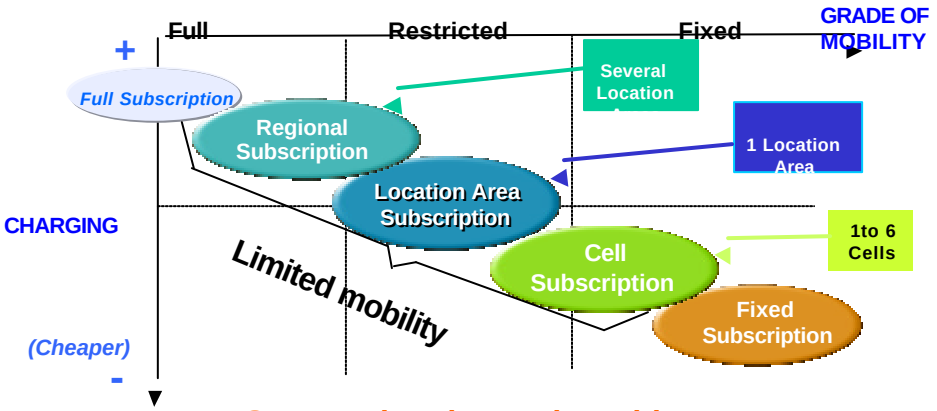
Business Standpoint



Segmenting the market with a
PAY AS YOU MOVE adapted charging

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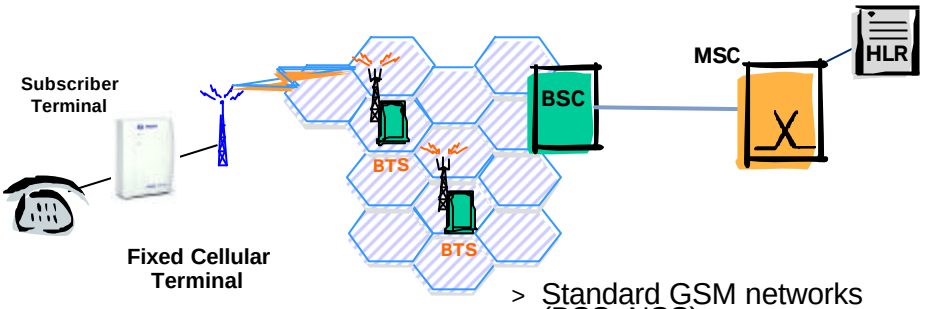
GSM Local Loop
Fixed subscribers: No mobility



- Standard GSM networks (BSS+NSS)
- Quick installation
- Rapid deployment in remote areas
- PSTN-like environment
- Specific terminals: Fixed GSM

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GSM Local Loop
Fixed subscribers : Fixed GSM Terminals

- **Strengths of fixed GSM terminals**
  - Different types of fixed GSM terminals:
    - GSM adapter + standard fixed telephone Sockets for other devises: PC, fax..
    - Fixed GSM telephone handset
    - GSM payphones (e.g. Ascom, Schlumberger,...)
  - Compliant with fixed licenses terms



Fixed GSM handset

- **Weaknesses of fixed GSM terminals:**
  - Less economical terminals compared to standard GSM terminals
  - Permanent local AC power supply is required
  - Installation of an outdoor antenna may be required

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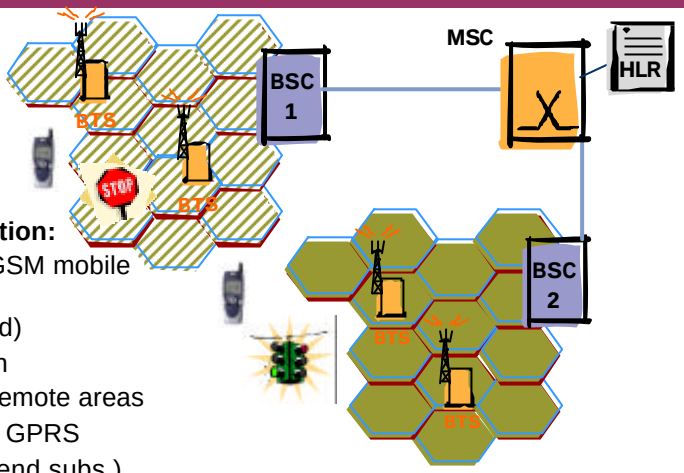
GSM Local Loop
"Semi-mobile" subscribers

Region or Location Area 1:
Barred for semi-mobile subscribers



> **Advantages of the solution:**
- Lower cost standard GSM mobile phones
- Mobility (though limited)
- No terminal installation
- Rapid deployment in remote areas
- Data functionality with GPRS (GPRS term. for high-end subs.)
- Subs. Taxed differently in "Home Zone"

Region or Location Area 2:
Allowed for semi-mobile subscribers

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Lessons from the field

Limits of Fixed WLL in rural areas

…. for individual/residential telephone services

Operator side

Investment Cost
- Limited coverage
- Terminal cost

Operating cost
- At home, Installation & Maintenance
- Billing management
- Bad debt

Area of Responsibility

User side

Telephone bill
- Relative cost
- Subscription
- Outside period

Electricity
- Availability
- Relative cost
- QoS
- Priority use?

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Presentation Outline

- The Operator Opportunities
- **Alcatel GSM Local Loop Package**
  - GSM Local Loop solutions
  - Benefits from Solution advantages
- Regulation issues

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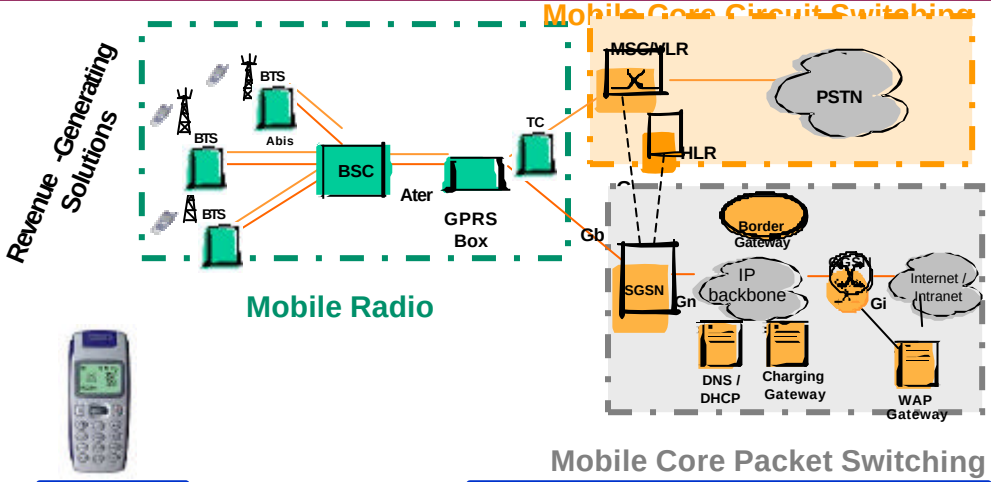
The Evolium™ Concept
Part of a Global Portfolio End-to-End Mobile Solutions



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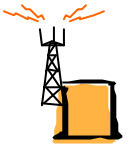
Key Solution Assets

Radio solutions



- Coverage
- Transmission inside:
  - IDU (Indoor unit) microwaves board
  - integrated in the same cabinet
- Compactness
  - Up to 12 TRX per outdoor cabinet
- Voice Quality
  - EFR, HR & AMR features

Core-network solutions

- Scalability & high capacity
- Multi-functional Switch
  - Allows fixed-mobile convergence
- Secure Inter-working with services environment
  - Added value services (Camel, GPRS, optimal routing…)
  - Field-proven resistance to IN

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The Solution Concept
GSM Solutions: 3 Major Driving Forces

Meet every needs, every time.
You grow, network grows.
Add services, multiply revenues.

Cutting site costs

The right number of BTS sites

Minimum BTS & MSC/TC site engineering

Modular capacity

17% sites saved Vs best competition

Easy operation & expansion

Painless maintenance

Easy upgrade & reconfigurations

Network optimisation

Differentiate your network

Network & voice quality

Capacity expansion solutions

GPRS/ E-GPRS/ UMTS ready

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Value added services

Operators can benefit from pre-paid solution as traditional mobile networks do

Significant voice revenues increase

- > Increase voice traffic
- > Acquire new customer base
- > Increase price charged per call
- > Suppress bad payers

With Prepaid Solution,

Customise your prepaid offer to your fixed GSM users

While reducing costs

- > Reduced customer
- > acquisition cost
- > No billing costs
- > No collection costs
- > Lower customer care
- > Cheaper channel support

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Value added services

SMS

- > Send and receive “short messages” (up to 160 characters)
- > Delay depends on traffic
- > If handset allows for display of SMS

Voice mail

- > A **fully featured** product for Voice & Fax messaging
- > With the complete set of **message notification** mechanisms

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Application example for Rural Areas

> **Individually fixed GSM mast :**
  - Connection with other equipment : fax, PABX, ...
  - Extension of coverage with an exterior antenna

> **Community service telephones:**
  - **Vodacom (South Africa)** is a mobile operator, which was required under its national GSM license to install **22,000 community service telephones** in rural and other under served areas
  - Phone Shop franchise concept
    - Fully equipped telephone bureau: 5-10 GSM payphones
    - Call rates are highly subsidized
  - **2,135 Phone Shops** in service by mid-2000

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Colombia: Edatel

> **Incumbent fixed operator**

> Frequency band : 900 MHz (7 MHz of spectrum)

> The spectrum has been allocated specifically for this WLL rural project

> **No license fee**; just annual spectrum usage fee

> 7000 rural subscribers (mostly residential) clustered in 26 villages

> Total area covered : 16,250 sq. km in Cordoba and Antioquia departments

> **PSTN tariffs**

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INDIA: Local entrepreneurship for sustainable Telecenters

Estimating CAPEX of around 600$ per Telephone line ….
…. Only 2% of Indian households can afford it on individual basis

→ **Aggregate the demand**

>Today: **950 000 Phone shops** serving most of smallest towns
- 300 million of people have access
- 25% of national Telecom income

>Tomorrow: 2003 – 2004
- **Another million of community lines** (Phone+Internet)
- BSNL (Fiber to rural areas)
- Private Access operator(WLL target cost: 200 $)
- Improving ARPA thanks to Rural Service providers (N.Logue, TeNeT, .)

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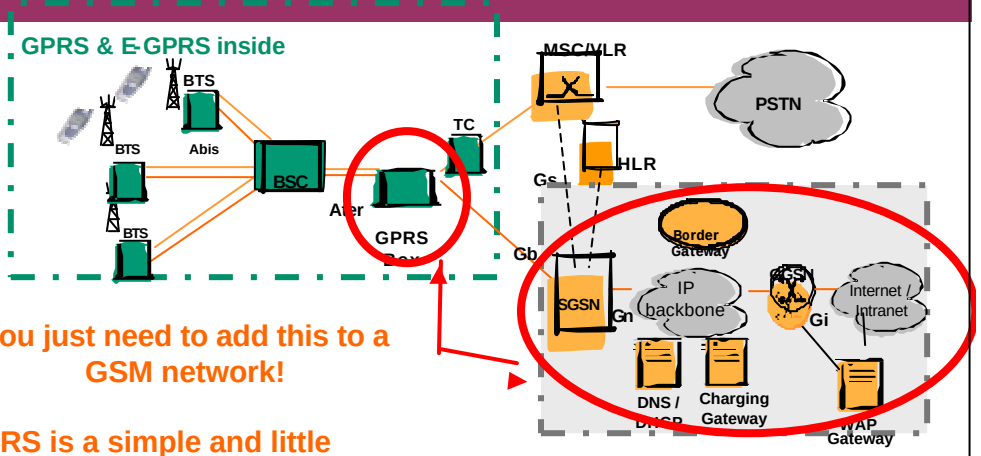
Data Inside: GPRS & EDGE



You just need to add this to a GSM network!

GPRS is a simple and little costly upgrade of a GSM network.

The Web-community service is an application example

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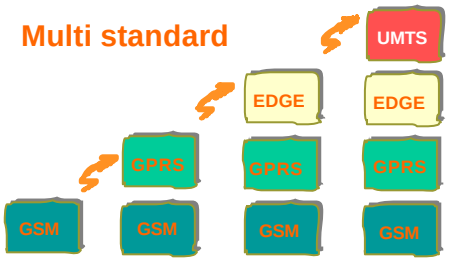
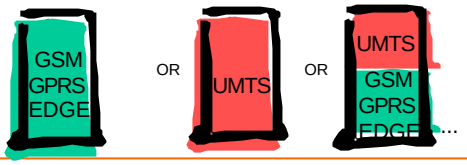
Differentiate your Network
Network's solution: ready to evolve to UMTS



> Past Investment **Protection: Hardware ready** for UMTS
- **Backward compatibility** with UMTS plug-in
- Hardware **ready** for EDGE

> The most flexible solution:
- Multi-standard Base Stations



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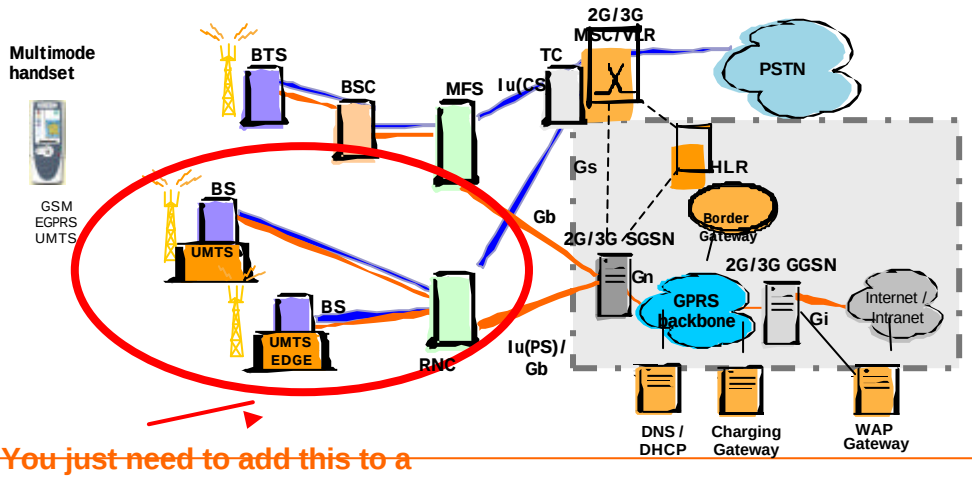
Differentiate your Network
Network's solution: Integrated GSM/UMTS RAN



You just need to add this to a GSM network!

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Presentation Outline

- The Operator Opportunities
- Alcatel GSM Local Loop Package
- **Regulation issues**

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Regulatory issues

- Two main areas of concern for regulators regarding GSM-LL
  - GSM spectrum availability, particularly in the 900 MHz band (in many countries was already allocated to mobile operators)
  - Additional competition to existing mobile operators, i.e. an unfair change of the mobile market structure

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GSM Spectrum Availability ?

- **No real shortage of spectrum in rural zones**
  - Mobile networks are first of all deployed in urban areas and along main roads (highest business potential)
  - Rural coverage is the last investment priority for commercial GSM operators (lowest business potential)
  - Many rural areas will remain without radio coverage for many years ⇒ a lot of unused spectrum !
- **Little spectrum is needed to meet rural demand**
  - Subscriber density is low (usually below 10 users per sq.km)
  - 2 x 5 MHz should be sufficient in most cases
    - 2 TRX, 8.20 Erlang per sector (GoS 2%)
    - 492 subscribers per 3-sector base station at 50 mErl/subscriber

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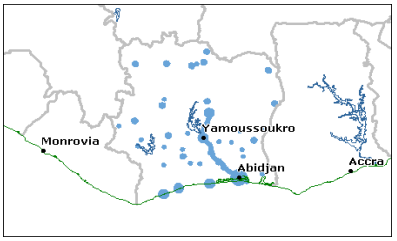
Competition with mobile operators ?

- **Big differences with a commercial mobile service**
  - Communication services are to be provided at regulated, PSTN-like tariffs (universal access context)
  - End-user mobility
    - either no mobility at all (fixed GSM terminals)
    - or a cordless phone-like mobility (with a standard GSM handset)
- In most emerging economies, **mobile operators have a very small subscriber base among rural** population which is not covered by the network



GSM network coverage of Ghana and Ivory Coast

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GSM in the Local Loop should be authorised

Use of GSM technology in rural WLL projects will not create any regulatory problems, provided that

- GSM spectrum is **allocated on a limited geographical** basis, i.e. only to a clearly identified rural area
- Services are provided at **regulated, PSTN-like tariffs**
- The operator complies with the **restriction of mobility**
  - This can be easily controlled by allowing only fixed GSM terminals
  - But mobile handsets give a more economical solution for the operator

A relevant technology is available…..

Universal Access development is frozen by regulation !

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South Africa: Under Serviced Area Licences

> To be issued for areas/departments where teledensity is below 5%

> Allows for Fixed-Mobile Service
- Either fixed or mobile network can be deployed
- In case of mobile network
  - fixed terminals
  - **mobile handsets**, but without call handover between cells

> License holders may apply for the 1800 MHz radio spectrum

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Conclusion

- There is a strong World-Wide need to have access to a phone and data
- It is a big revenue generator for operators to address this rural market
- Mobile type of infrastructure is a cost effective solution for this kind of market
- The technology exists today
- FST or normal handsets can be used to provide voice and internet access
- Different types of limited mobility can be provided with different tariffs
- Implementation cost is marginal compared to normal wireline access
- The evolution to broadband is enabled
- A concern is that Universal Access development is frozen by regulation

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Thank you for your attention….