

# **TELECOMMUNICATIONS IMPACT ON DEVELOPING COUNTRIES**

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**2007**

# **TOPICS FOR DISCUSSION**

- **ICT PROBLEM, SOLUTIONS, FACTORS AND POLICIES – WHY?**
- **ECONOMICAL ICT TECHNOLOGY**
- **MOBILE AND INTERNET TAKE UP**
- **INTERNET – WHAT IS IT AND WHAT DOES IT MEAN?**
- **INTERNET CONCERNS**
- **VOICE OVER INTERNET PROTOCOL (VoIP)**
- **VoIP FOR DISABILITIES**
- **VoIP AND THE PUBLIC SWITCHED TELECOMMUNICATIONS NETWORK (PSTN)**
- **WIRELESS AND THE PSTN**
- **WORLD TRADE ORGANIZATION SIGNIFICANCE**
- **VSAT, MOBILE SATELLITE, AND COMPARATIVE PRICING**

# ICT PROBLEM AND SOLUTIONS

## PROBLEM:

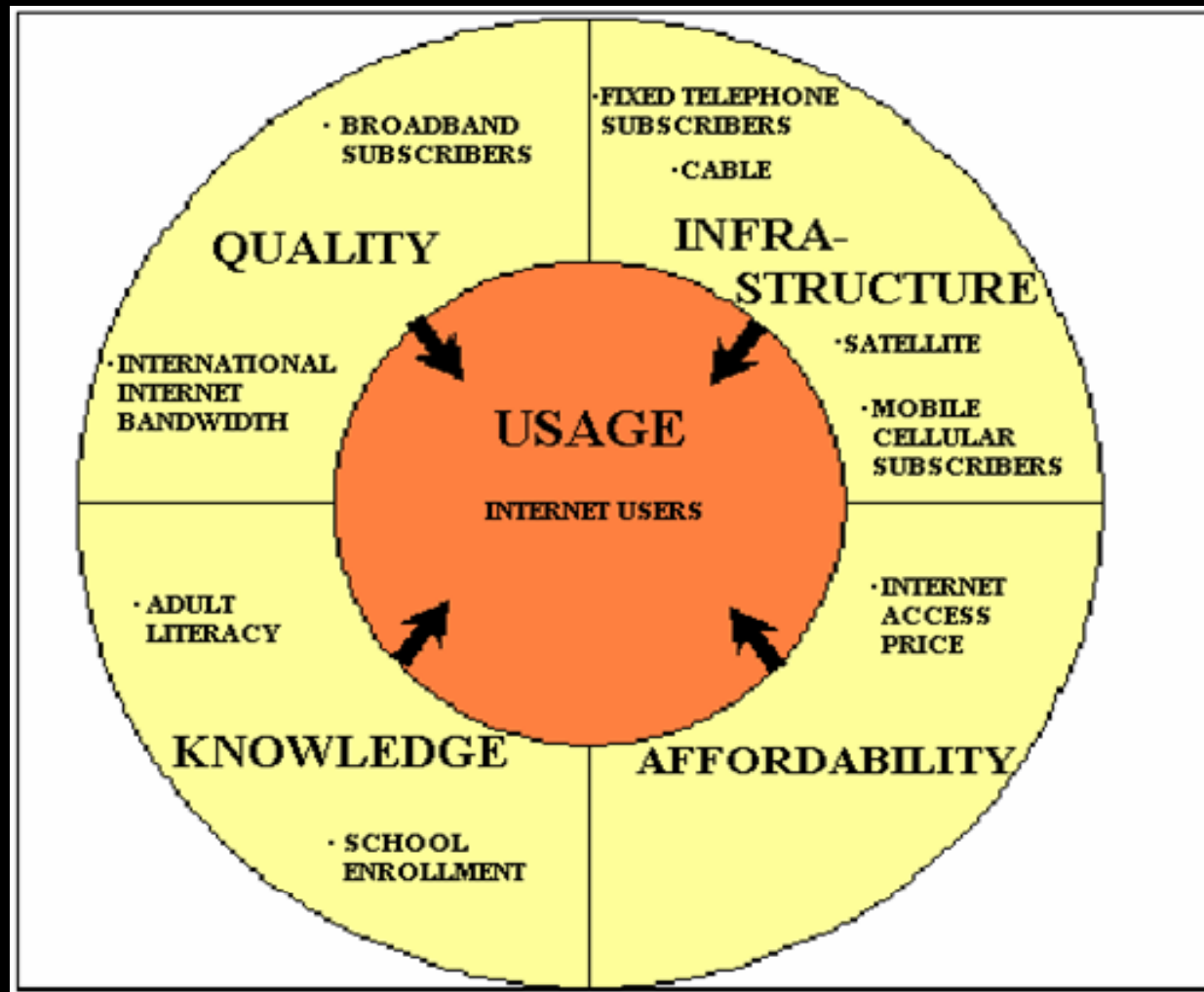
TECHNOLOGY HAS WIDENED THE *DIGITAL DIVIDE* BETWEEN DEVELOPED AND DEVELOPING COUNTRIES.

## SOLUTION: \*

1. IMPROVE EDUCATIONAL SYSTEMS, AND
2. EXPAND TELECOMMUNICATION NETWORKS

\*ILO at the World Economic Forum, Davos

# INFORMATION AND COMMUNICATIONS TECHNOLOGY FACTORS FOR ACCESS



SOURCE: ITU

# **UNIVERSAL SERVICE AND UNIVERSAL ACCESS POLICIES**

- **MARKET SOLUTIONS WILL NOT ENSURE THE EXPANSION OF NETWORKS TO ECONOMICALLY LESS VIABLE (RURAL) AREAS OR TO DISABLED INDIVIDUALS**
- **UNIVERSAL SERVICE OR UNIVERSAL ACCESS OBLIGATIONS, AND FUNDING ARE A NATIONAL POLICY ISSUE**

# **ICT POLICY OBJECTIVES**

- **FOSTER COMPETITIVE AND INNOVATIVE INTERNET CONNECTION, AND MULTIMEDIA INDUSTRIES**
- **MINIMIZE REGULATION AND ENACT FLEXIBLE REGULATORY POLICIES**
- **PROMOTE MARKET ACCESS AND ADOPTION OF OPEN, NON-DISCRIMINATORY, TRANSPARENT POLICIES**

**WHY?**

# **ICT POLICY *ROUGHLY* CORRELATES TO ECONOMY\***

- **19% OF QATAR'S POPULATION USES THE INTERNET; PER CAPITA INCOME - - \$20,700**
- **17% OF CAYMAN ISLANDS' POPULATION USES INTERNET; PER CAPITA INCOME - - \$35,000**
- **1% OF SYRIA'S POPULATION USES THE INTERNET; PER CAPITA INCOME - - \$1,160**
- **< 1% OF GHANA'S POPULATION USES THE INTERNET; PER CAPITA INCOME - - \$270**

**CONCRETE PROPOSALS TO FUND PROJECTS  
DESIGNED TO NARROW THE *DIGITAL DIVIDE***

**“WORLD SUMMIT OF THE INFORMATION SOCIETY”  
GENEVA**

**\* FEBRUARY 2005 REPORT TO EU COMMISSION**

# **LOW-COST COMPUTERS AND MOBILE HANDSETS**

**MIT MEDIA LABORATORY HAS DEVELOPED AN EXPERIMENTAL LAPTOP USING LINUX, A 1 GBYTE SOLID-STATE FLASH MEMORY (NO HARD DISC), LOW-COST BATTERIES WITH HAND-CRANK OR FOOT-PEDAL CHARGER, AND LOW-COST MINIATURE REAR PROJECTION SCREEN (HALF THE COST OF A LAPTOP TODAY IS THE SCREEN). “ONE LAPTOP PER CHILD” HAS MOVED FROM MIT TO A SEPARATE NONPROFIT ORGANIZATION.**

**COST  $\approx$  \$100**

**GSM ASSOCIATION HAS DEVELOPED A LOWCOST HANDSET IN RESPONSE TO DEMAND FROM DEVELOPING COUNTRIES. STATED GOAL IS “TO HELP CONNECT THE UNCONNECTED PEOPLE OF THE WORLD”. EIGHTEEN OPERATORS AND MANUFACTURERS (AIS, BHARTI, COMPAL, COMPEQ, GLOBE, INFINEON, MAXIS, MOTOROLA, NOKIA, ORASCOM, ROYAL PHILIPS, SAMSUNG, SINGTEL, SMART, TECHFAITH, TELENOR, TEXAS INSTRUMENTS, AND TURKCELL) ARE PARTICIPATING IN THIS INITIATIVE. SIX MILLION PHONES ARE BEING DISTRIBUTED IN THE FIRST PHASE OF THIS PROGRAM CALLED “EMERGING MARKET HANDSET INITIATIVE”.**

**COST GOAL < \$40 (ACTUAL = \$46, DEPENDING ON TAXES)  
(SEEKING A UNIT THAT COSTS < \$30)**



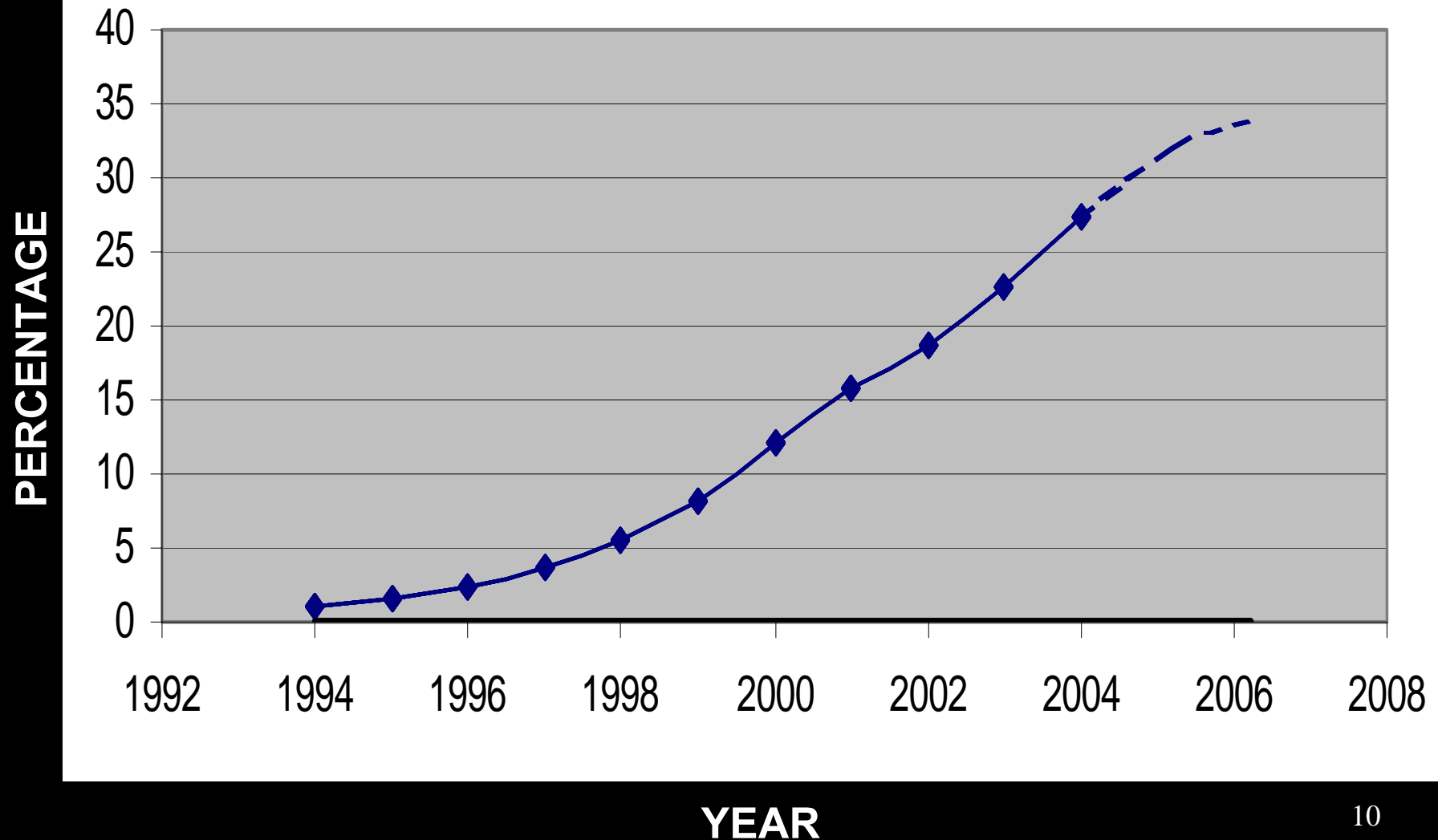
# **ONE LAPTOP PER CHILD PROGRAM**

**THAILAND, NIGERIA, BRAZIL  
AND ARGENTINA ARE TAKING  
TAKING A LEAD WITH  
DEPLOYMENT OF 5 TO 7  
MILLION MACHINES IN 2007.**



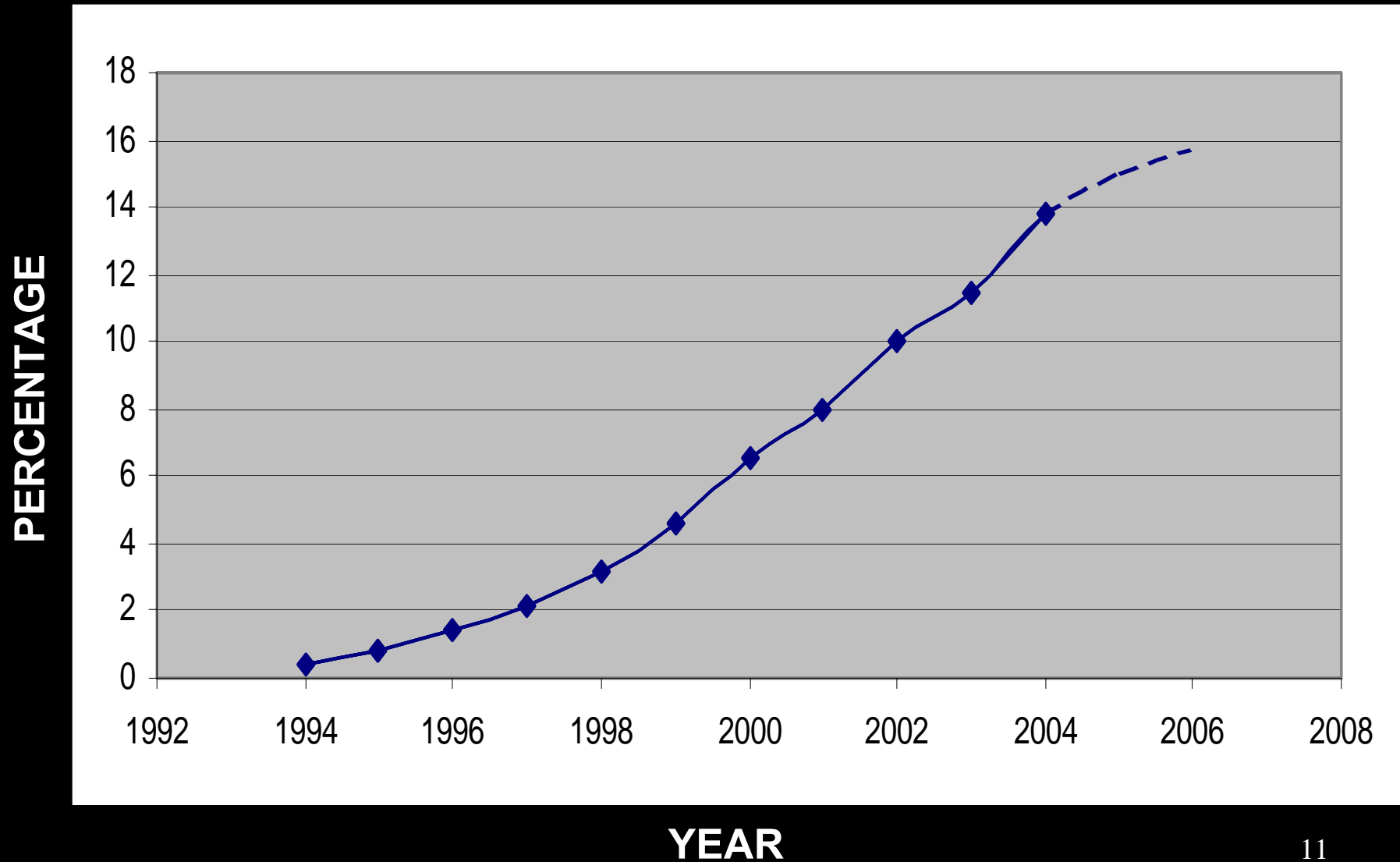
**CHINA, EGYPT, AND INDIA (WITH ABOUT  
25% OF THE WORLD'S CHILDREN) HAVE  
EXPRESSED INTEREST IN THIS PROGRAM.**

# MOBILE TELEPHONE SUBSCRIBERS GLOBALLY PER 100 INHABITANTS



SOURCE: INTERNATIONAL TELECOMMUNICATION UNION

# INTERNET USERS GLOBALLY PER 100 INHABITANTS



SOURCE: INTERNATIONAL TELECOMMUNICATION UNION

# **INTERNET?**

**THE INTERNET HAS ENABLED THE  
CREATION OF BUSINESSES  
WITHOUT MUCH CAPITAL. IT HAS  
ENLARGED THE COMPETITION --  
NOT ONLY THE SHOP DOWN THE  
STREET BUT THE SHOP HALFWAY  
AROUND THE WORLD.  
GEOGRAPHICAL BOUNDARIES ARE  
DISAPPEARING.**

# **CONVERGENCE TO INTERNET**

- **TREND IS TOWARDS THE CONSOLIDATION OF VOICE, VIDEO AND DATA SERVICES IN THE INTERNET**
- **PROGRESS TOWARD THIS CONSOLIDATION WILL BE VIA DEVELOPMENTS SUCH AS UBIQUITOUS BANDWIDTH, INCREASED EASE OF USE, GREATER CONNECTIVITY AND IMPROVED SECURITY**

# MAJOR DOMAINS\*

.ASIA

.AERO

.ARPA

.BIZ

.COM - 47%

.COOP

.COUNTRY CODES: (.de - 12%  
and .uk - 8%)

.EDU

.EU

.GOV

.MOBI

.INFO

.INT

.JOBS

.MAIL

.MIL

.MUSEUM

.NAME

.NET - 7%

.ORG - 4%

.PRO

.TEL (PENDING)

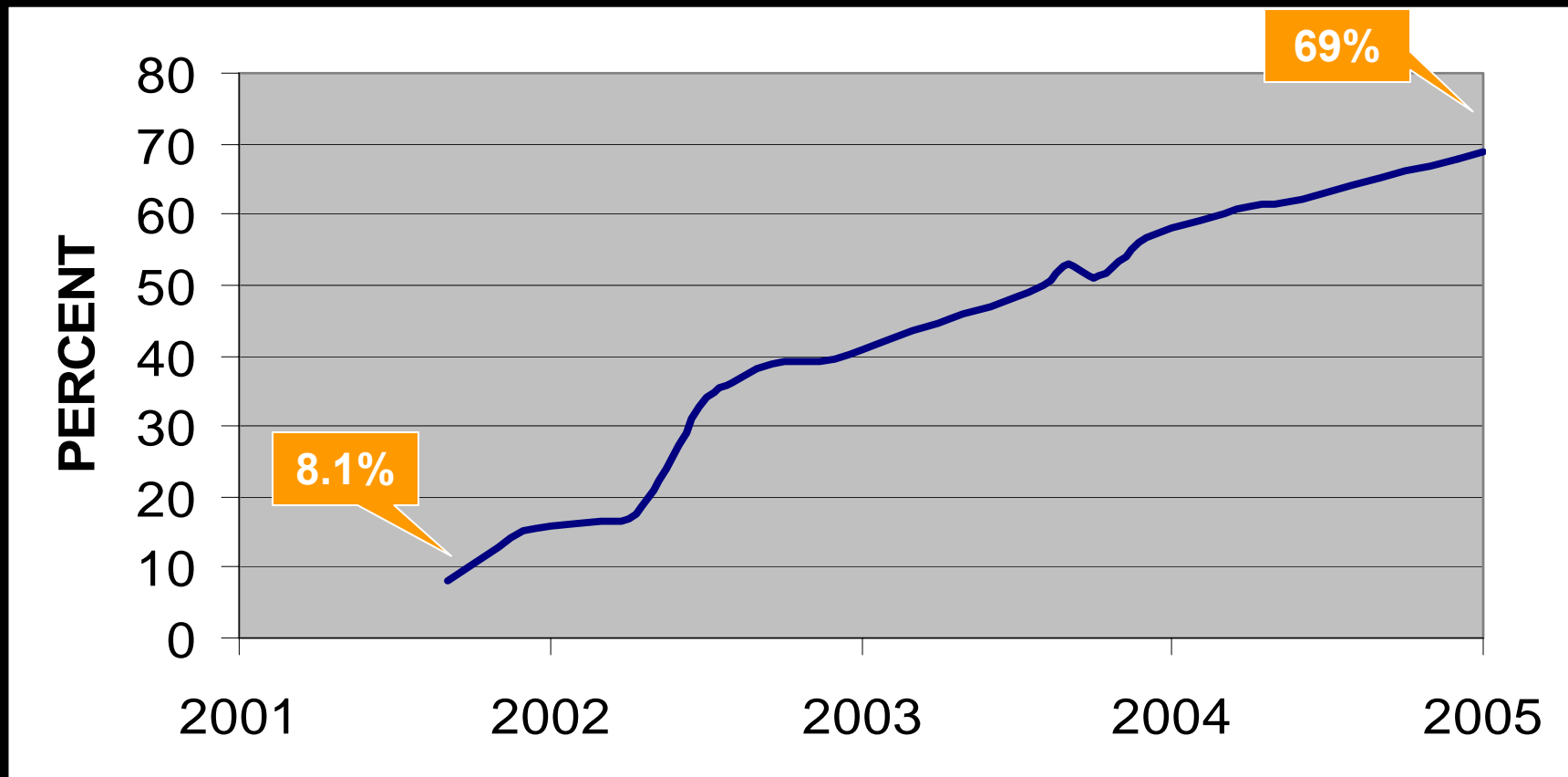
.XXX (NOT ADOPTED)

**\*BOTH JAPANESE AND CHINESE CHARACTERS ARE NOW IN USE**

# **INTERNET CONCERNS**

**FRAUD - AUTHENTICITY  
CYBERSTALKING OR VOYERISM  
GAMBLING  
MONEY LAUNDERING  
DRUG TRAFFICKING  
PORNOGRAPHY  
TAXES  
SPAM  
QUALITY  
INTELLECTUAL PROPERTY RIGHTS  
VIRUSES  
CULTURE  
SECURITY (PRIVACY)  
WIRELESS NUMBER DIRECTORY**

# PERCENTAGE OF WORLDWIDE E-MAIL IDENTIFIED AS SPAM (WITHOUT SPAM FILTERS)



SOURCE: MENG WONG, MICROSOFT CORP., SYMANTEC CORP.



# **WHAT IS VoIP / INTERNET VOICE?**

**VOICE OVER INTERNET PROTOCOL (VoIP) ALLOWS TELEPHONE CALLS USING A COMPUTER NETWORK -- A DATA NETWORK, LIKE THE INTERNET:**

- VoIP CONVERTS THE VOICE SIGNAL FROM YOUR TELEPHONE INTO A DIGITAL SIGNAL THAT TRAVELS OVER THE INTERNET THEN CONVERTS IT BACK AT THE OTHER END SO YOU CAN SPEAK TO ANYONE WITH A REGULAR PHONE NUMBER.**
- WHEN PLACING A VoIP CALL USING A PHONE WITH AN ADAPTER, YOU'LL HEAR A DIAL TONE AND DIAL JUST AS YOU ALWAYS HAVE.**
- VoIP ALSO ALLOWS YOU TO MAKE A CALL DIRECTLY FROM A COMPUTER USING A CONVENTIONAL TELEPHONE OR A MICROPHONE.**

# **VOICE OVER INTERNET PROTOCOL**

**VoIP IS NOT JUST ANOTHER WAY OF PROVIDING TRADITIONAL TELEPHONE SERVICE. IT IS A NEW APPLICATION ON A NEW KIND OF NETWORK THAT WILL CREATE NEW OPPORTUNITIES FOR BUSINESSES AND CONSUMERS. VoIP WILL RAISE STANDARDS ISSUES THAT NEED SOLUTIONS SUCH AS:**

- ARRANGEMENTS FOR FINANCE / PSTN CONNECTION**
- SUPPORTING EMERGENCY RESPONSE NEEDS OF PUBLIC SAFETY AUTHORITIES, ESPECIALLY AS RELATED TO THE RESPONSE LOCATION**
- VoIP TECHNOLOGIES HELPING ACCESSIBILITY AND USABILITY OF COMMUNICATIONS NETWORKS BY PERSONS WITH DISABILITIES**
- SECURITY AND LEGAL ISSUES NEED RESOLUTION IN RESPONSE TO APPROPRIATE LEGAL REQUIREMENTS**

# **IP FOR PERSONS WHO ARE DEAF**

- **IP BROADBAND (DSL OR CABLE MODEM) CAN SUPPORT VIDEO CALLING, AND BECAUSE A PC CAN BE USED FOR VIDEO, IN MANY CASES THE ONLY COST TO THE CONSUMER IS A USB VIDEO CAMERA**
  - **IP VIDEO CALLING WILL LIKELY BECOME WIDELY USED IN THE NEAR FUTURE, BOTH FOR BUSINESS AND HOME CALLERS**
  - **THIS WILL BENEFIT THE DEAF AND HARD-OF-HEARING COMMUNITIES, AS THEY WILL BE ABLE TO USE SIGN LANGUAGE AND LIP READING ON VIDEO CALLS, AND BE ABLE TO BETTER AFFORD HARDWARE**
- **GALLAUDET UNIVERSITY IS ALREADY EXPERIMENTING WITH VIDEO CALLING, AND EVEN HAS INSTALLED MANY "VIDEO TELEPHONE BOOTHS" ON ITS CAMPUS, FOR STUDENTS TO MAKE IP VIDEO CALLS TO EACH OTHER.**

# **VoIP FOR PERSONS WHO ARE BLIND**

- **TECHNOLOGY AND COST LIMITATIONS OF PTSN PHONES CREATE BARRIERS FOR ACCESS BY BLIND USERS (FOR EXAMPLE, A BLIND USER CANNOT SEE A DISPLAY WITH CALLER ID ON IT)**
- **VoIP "PHONES" CAN BE USED WITH SOFTWARE-BASED TELEPHONES OR STANDARD PCs WITH AN AUDIO CARD AND SPEAKERS, AND THEN EASILY AND CHEAPLY CUSTOMIZED FOR ACCESSIBILITY FEATURES**
  - **PCs (WINDOWS AND APPLE) ALREADY HAVE EXISTING "ACCESSIBILITY FEATURES" THAT THE VoIP SOFTPHONE CAN TAKE ADVANTAGE OF, SUCH AS TEXT-TO-SPEECH FOR AUDIBLE CALLER ID AND MESSAGE-WAITING INDICATION.**
  - **IT IS MUCH CHEAPER TO MAKE A BLIND-ACCESSIBLE TELEPHONE BASED ON A PC, THAN TO CREATE SPECIAL HARDWARE FOR A STANDALONE PHONE, MAKING BLIND-FRIENDLY TELEPHONES MORE AFFORDABLE.**

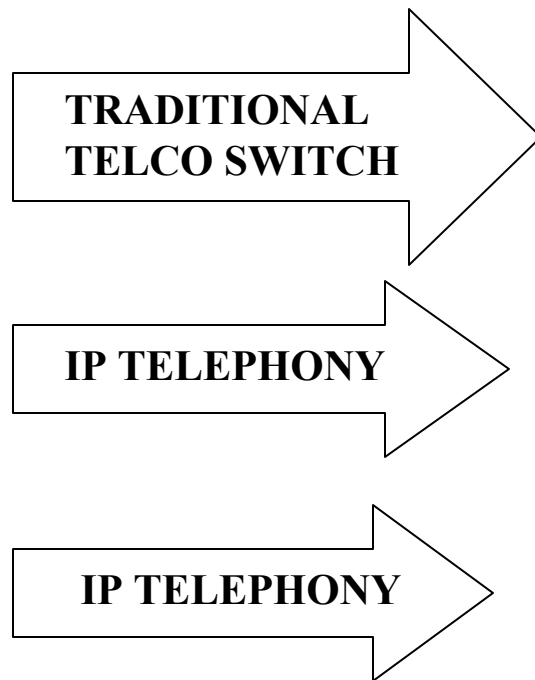
# **IP TELEPHONY AND THE PSTN**

- **PSTN IS BASED ON CIRCUIT-SWITCHED TECHNOLOGY, EVOLVED AS A VOICE NETWORK (HIGHLY REGULATED)**
- **INTERNET IS BASED ON PACKET-SWITCHED TECHNOLOGY, EVOLVED AS A DATA NETWORK (LARGELY UNREGULATED)**
- **INTERNET IS HEADED TO REPLACE THE PSTN BY A “NEXT GENERATION NETWORK” (NGN) – ITU-T STUDY GROUP**

# **VoIP AND PSTN RELATIVE COSTS**

- **IP TELEPHONY (VoIP) CAN BE OFFERED AT PRICES SIGNIFICANTLY BELOW THOSE FOR PSTN TELEPHONY**
- **PSTN PRICING IS DISTANCE-SENSITIVE WHILE PRICING OF IP TELEPHONY IS LARGELY INDEPENDENT OF DISTANCE (LIKE SATELLITE COMMUNICATIONS)**
- **VoIP MAY MEAN A TRADE-OFF BETWEEN QUALITY AND COST**

# VoIP vs SWITCHED CIRCUIT NETWORK COST



SOLUTION	INVESTMENT	CAPACITY	ADVANTAGES
CLASS 5 SWITCH	US \$20 MILLION	20,000 LINES	<ul style="list-style-type: none"> <li>• QUALITY</li> <li>• RELIABLE</li> <li>• PROVEN TECHNOLOGY</li> </ul>
INTERNET POP	US \$0.1 MILLION	400,000 MINUTES PER MONTH	<ul style="list-style-type: none"> <li>• EFFICIENCY</li> <li>• NEW SERVICES POTENTIAL</li> <li>• SCALABILITY</li> </ul>
IP FULL OPERATION	US \$3 TO 5 MILLION	35 MILLION MINUTES PER MONTH	

# **GLOBAL INTERNATIONAL TRAFFIC**

- **INTERNATIONAL SWITCHED TRAFFIC INCREASED JUST OVER SIX PERCENT IN 2002 TO 155.2 BILLION MINUTES; IN 2003 TO ALMOST 170 BILLION MINUTES (9.5% INCREASE)**
- **VoIP TRAFFIC SURGED 80 PERCENT IN 2002 TO 18 BILLION MINUTES, ACCOUNTING FOR MORE THAN 10 PERCENT OF INTERNATIONAL TRAFFIC; IN 2003 TO 24 BILLION MINUTES (33% INCREASE)**
- **VoIP APPEARS TO HAVE A NOTABLE IMPACT IN LATIN AMERICA, WHERE SWITCHED TRAFFIC VOLUMES DECREASED IN 2002.**
- **VoIP TRAFFIC TO INDIA, PAKISTAN, AND BANGLADESH MORE THAN DOUBLED IN 2003 OVER 2002**
- **VoIP IS STILL PRIMARILY USED TO BYPASS HIGH SETTLEMENT RATES IN DEVELOPING COUNTRIES**



# INTERNATIONAL VOIP TRAFFIC

	1998	1999	2000	2001	2002	2003
<b>VOIP TRAFFIC (MILLIONS OF MINUTES)</b>	<b>150</b>	<b>1,655</b>	<b>5,954</b>	<b>10,147</b>	<b>18,045</b>	<b>24,519</b>
<b>PTSN TRAFFIC (MILLIONS OF MINUTES)</b>	<b>93,000</b>	<b>108,000</b>	<b>132,027</b>	<b>146,095</b>	<b>155,165</b>	<b>166,615</b>
<b>VOIP SHARE OF INTERNATIONAL TRAFFIC</b>	<b>0.02%</b>	<b>1.5%</b>	<b>4.3%</b>	<b>6.5%</b>	<b>10.4%</b>	<b>12.8%</b>

SOURCE: TELEGEOGRAPHY INC. 2004, PRIMETRICA INC.

# TYPICAL VoIP CHARGES

## Destination · Rate/minute USD including VAT

Argentina \$ 0.037

Bangladesh \$ 0.156

Benin \$ 0.171

Burkina Faso \$ 0.216

Burundi \$ 0.177

Central African Republic \$ 0.225

Congo \$ 0.207

Ecuador \$ 0.204

Ghana \$ 0.176

India \$ 0.177

Indonesia \$ 0.106

# TYPICAL VoIP CHARGES

Iran \$ 0.153

Jamaica \$ 0.145

Kenya \$ 0.282

Mozambique \$ 0.198

Nepal \$ 0.390

Nigeria \$ 0.099

Papua New Guinea \$ 0.921

Poland \$ 0.024

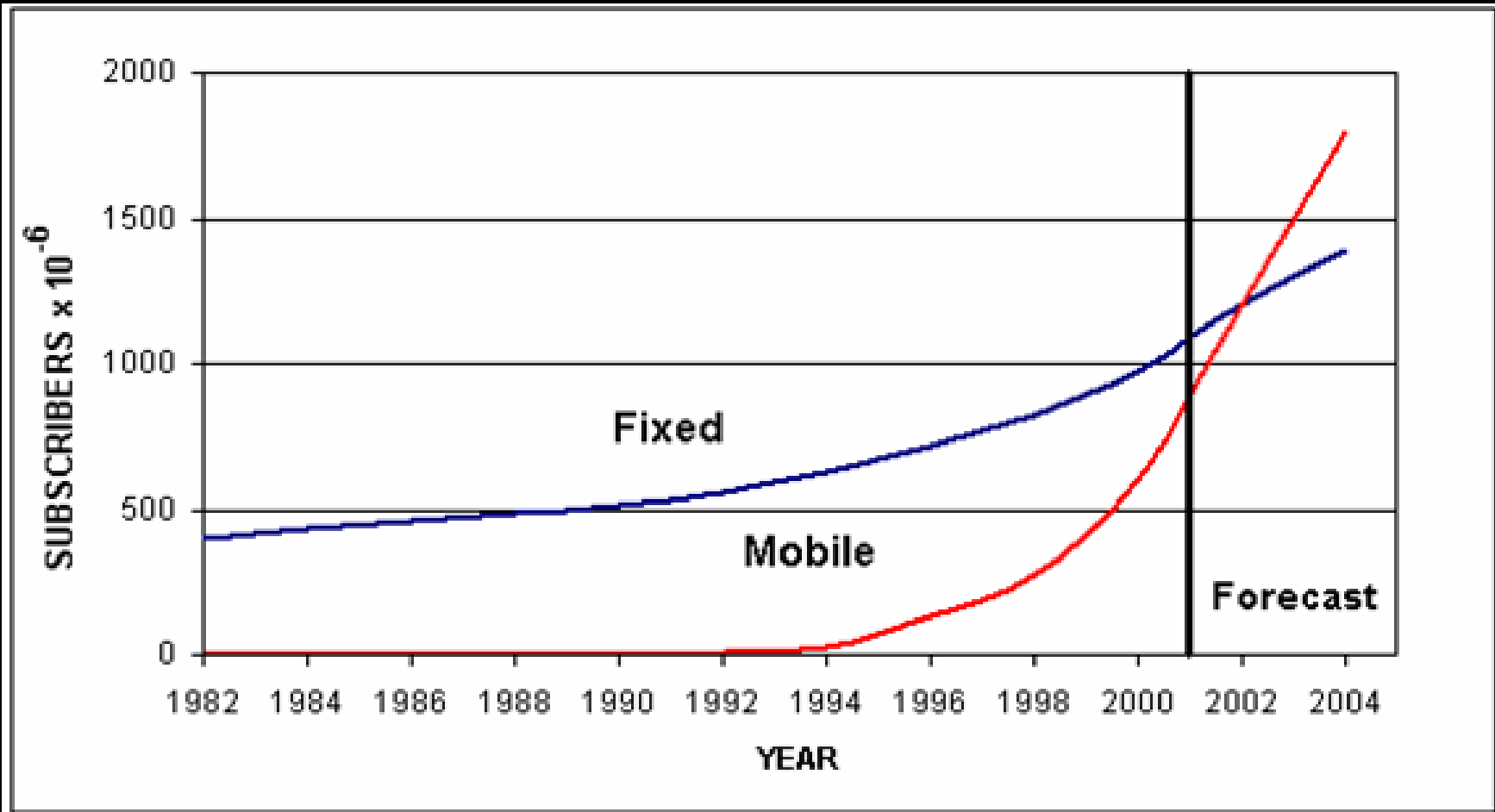
Sri Lanka \$ 0.170

Sudan \$ 0.292

Togo \$ 0.274

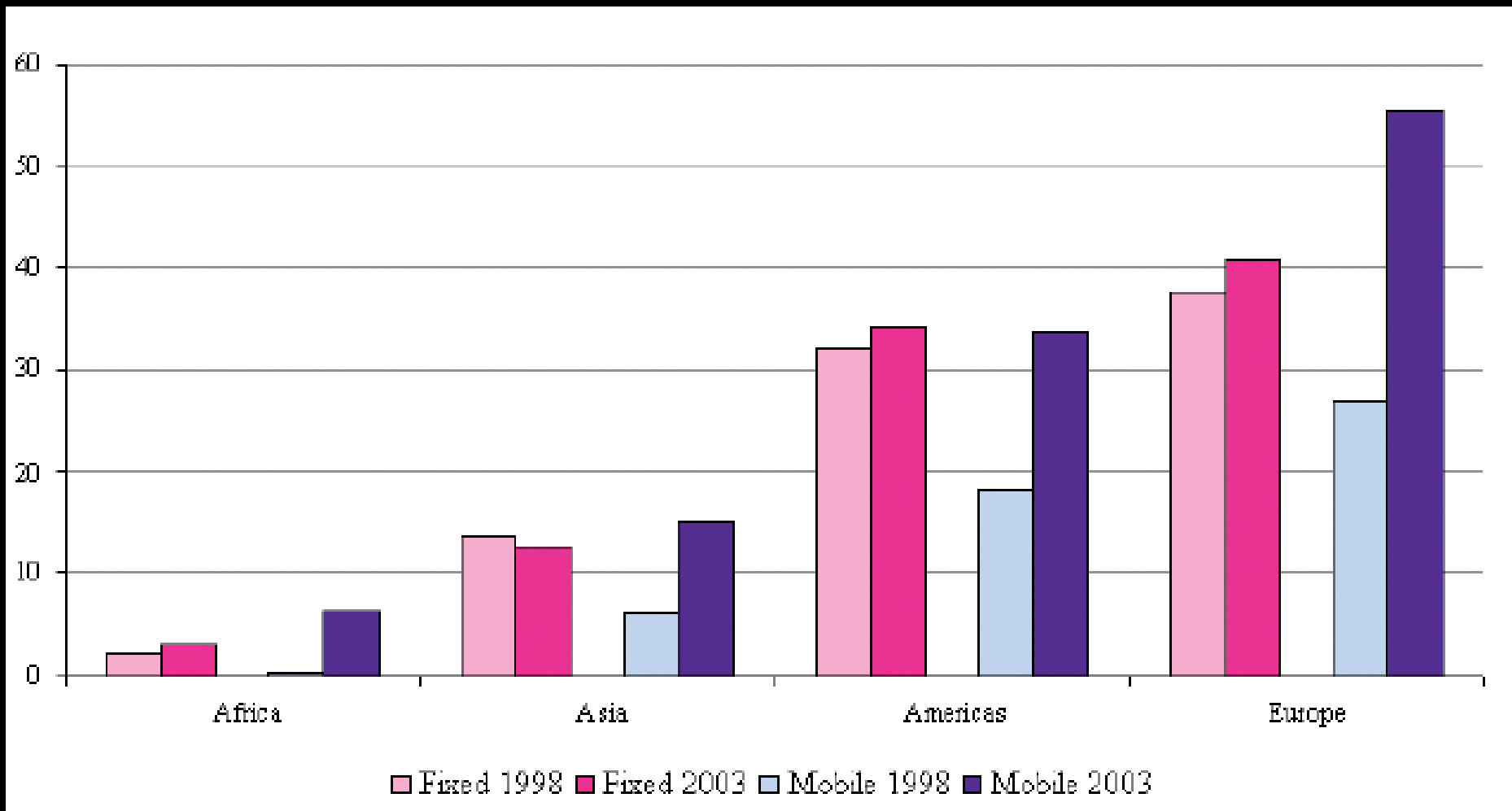
Venezuela \$ 0.060

# MOBILE AND FIXED TELEPHONE FORECAST (WORLDWIDE) AS A FUNCTION OF YEARS HAS PROVEN ACCURATE

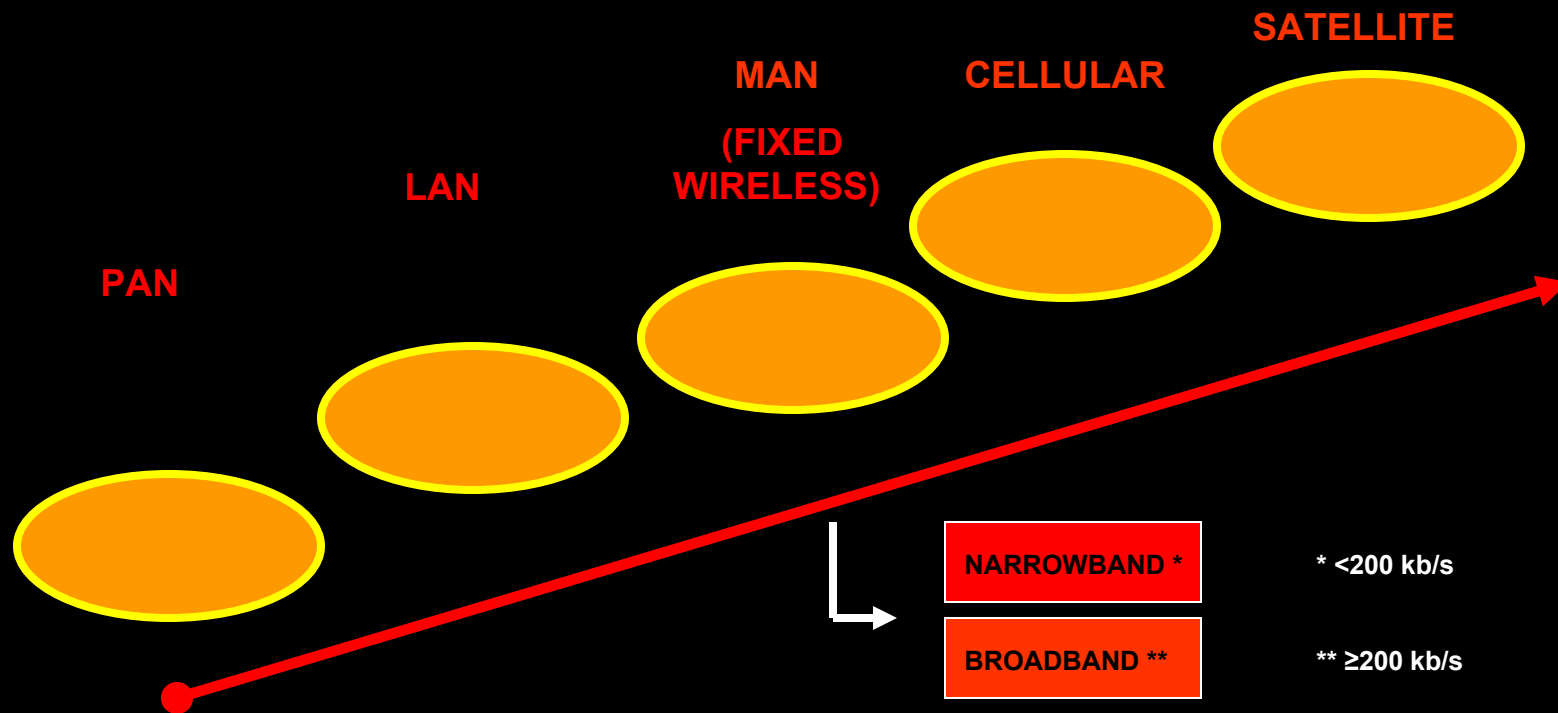


Source: ITU World Telecommunication Indicators Database and ITU projections.

# GLOBAL GROWTH OF FIXED AND MOBILE LINES (1998 TO 2003)



# WIRELESS MARKET



**PAN**  
 CORDLESS PHONES  
 PCs  
 PDAs  
 HOME GATEWAYS

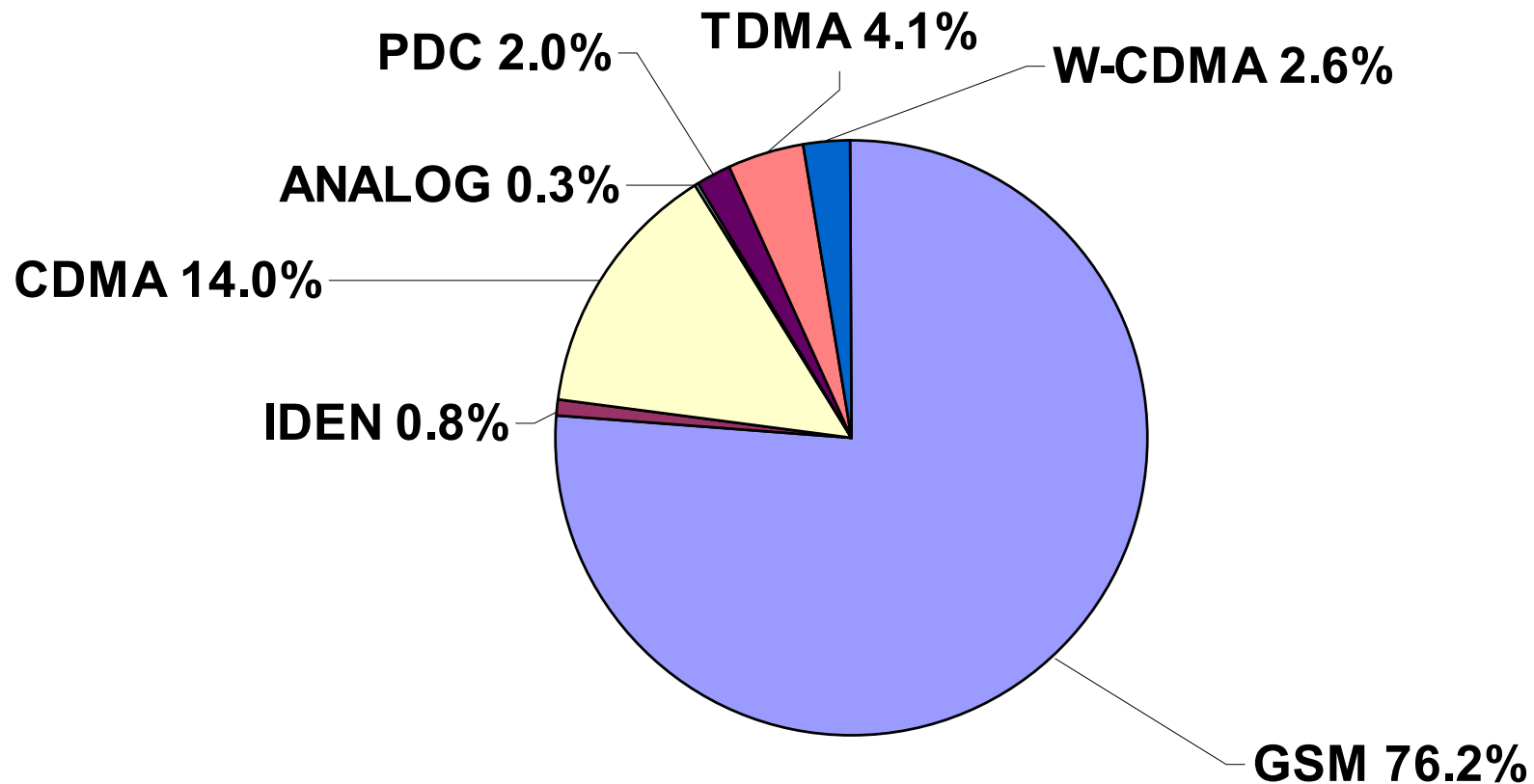
**LAN**  
 WLANS:  
 HOTELS  
 RETAIL  
 CONFERENCES  
 BUSINESS

**MAN**  
 RESIDENTIAL TOWERS  
 BUSINESSES  
 MUNICIPALITIES

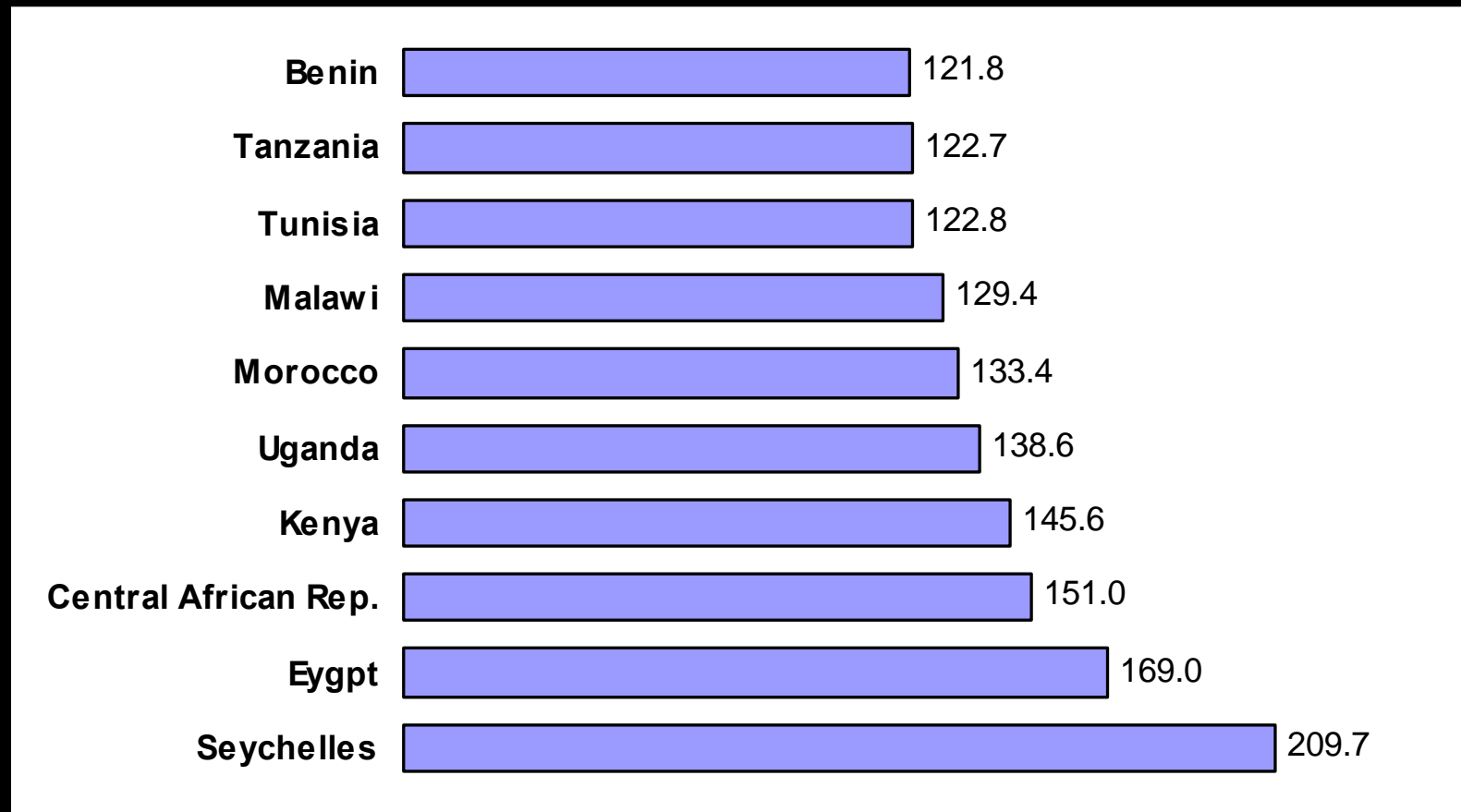
**3G  
 CELLULAR**  
 MULTIMEDIA (VOICE,  
 VIDEO, DATA)  
 CELLULAR PHONES

**SATELLITE**  
 GLOBAL CELLULAR  
 PHONES  
 RNSS

# WIRELESS TECHNOLOGY MARKET SHARE

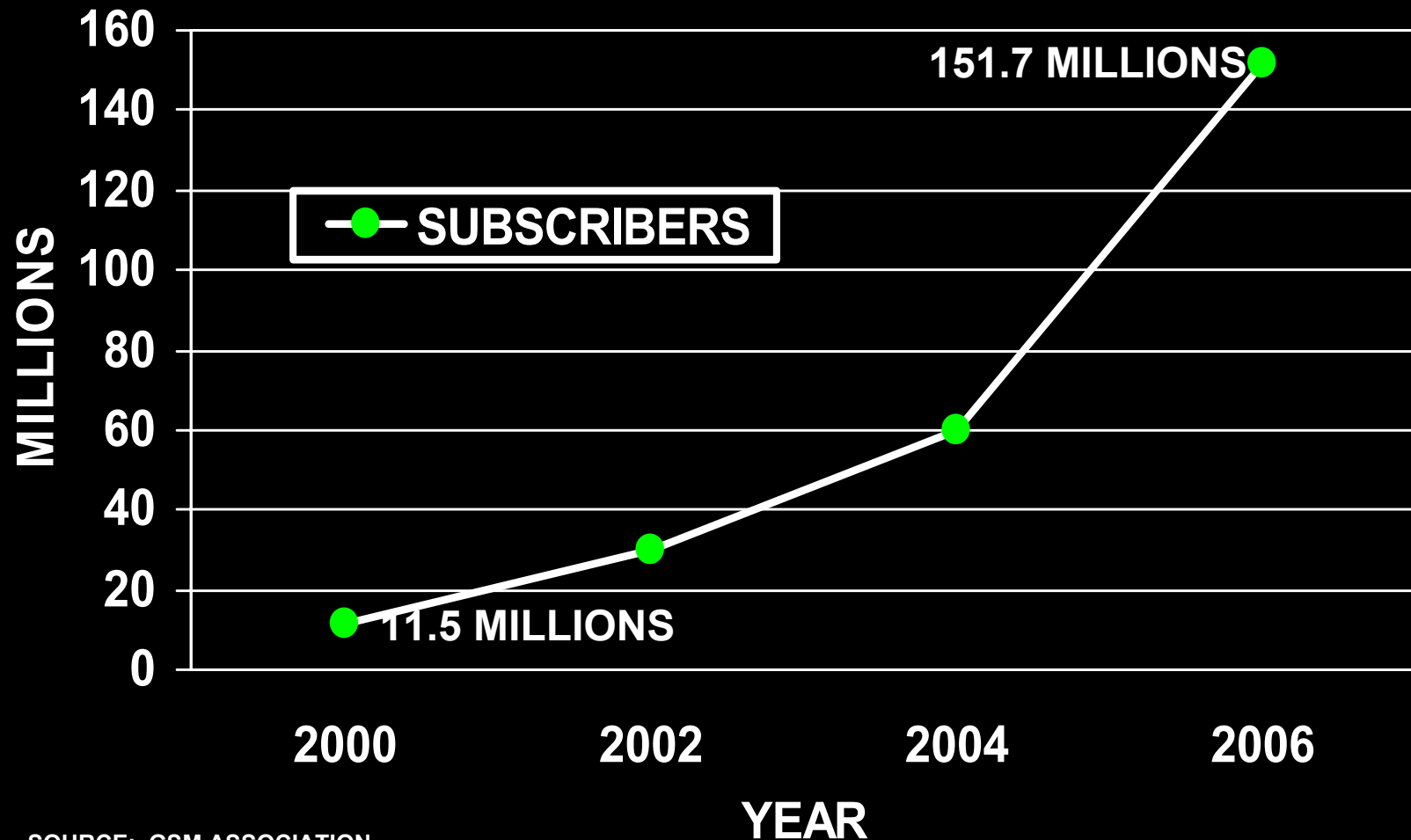


# MOBILE GROWTH IN AFRICA (1995-2001) TOP 10 ECONOMIES, COMPOUND ANNUAL GROWTH RATE (%)



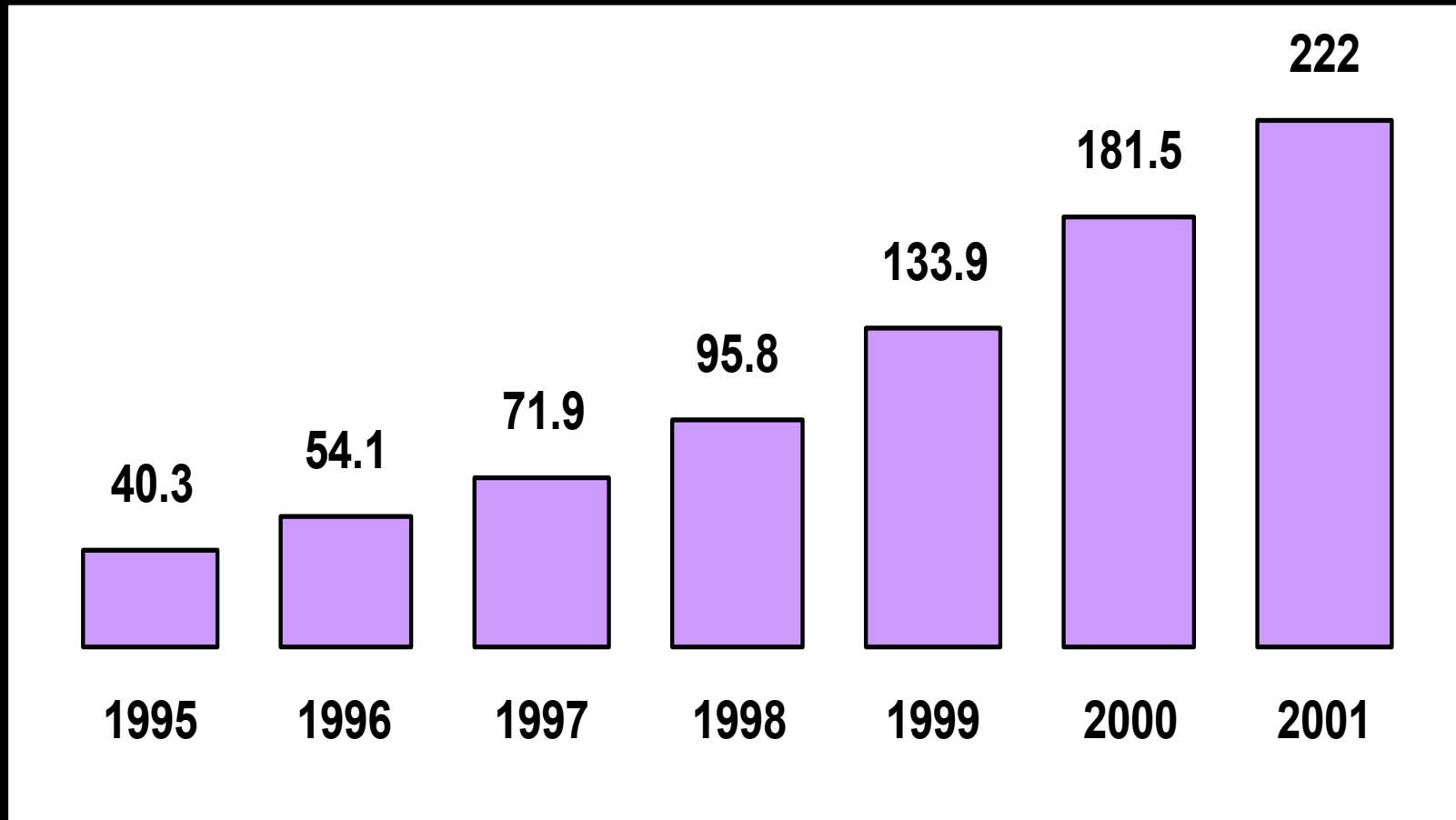


# IN AFRICA, THE NUMBER OF CELLPHONE SUBSCRIBERS



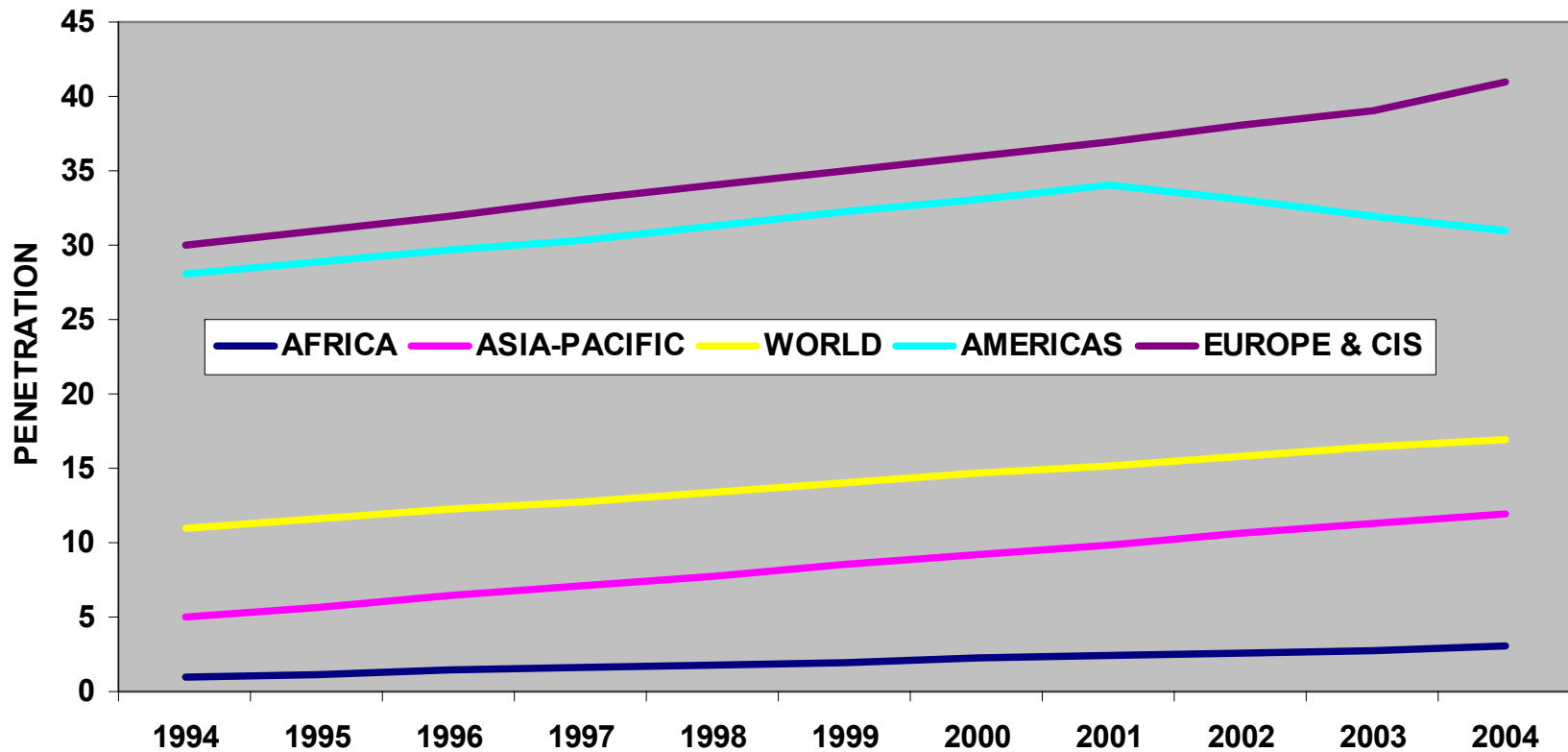
SOURCE: GSM ASSOCIATION

# MOBILE SUBSCRIBERS IN THE AMERICAS (MILLIONS)



Source: ITU Internet Reports 2002: Internet for a Mobile Generation.

# MAIN TELEPHONE LINES PER 100 INHABITANTS, 1994-2004



# **WORLD TRADE ORGANIZATION (WTO) AND TELECOMMUNICATION TRADE LIBERALIZATION**

- **WTO MEMBERSHIP ALLOWS MEMBERS TO MAKE BINDING TREATY COMMITMENTS IN SPECIFIC SECTORS, INCLUDING TELECOMMUNICATIONS SERVICES**
- **GENERAL AGREEMENT ON TRADE IN SERVICES (GATS) AS OF OCTOBER 2003:**
  - **105 WTO MEMBERS HAVE MADE SPECIFIC GATS COMMITMENTS IN SOME OR ALL ASPECTS OF TRADE IN TELECOMMUNICATIONS SERVICES**
  - **98 IN BASIC TELECOMMUNICATIONS; ORIGINAL COMMITMENTS IN 1997 KNOWN AS BASIC TELECOM AGREEMENT**

# **WTO AND TELECOMMUNICATIONS SERVICES**

- **WTO REFERENCE PAPER, ADOPTED BY MAJORITY OF MEMBERS MAKING COMMITMENTS IN BASIC TELECOMMUNICATIONS, IMPOSES OBLIGATIONS REGARDING:**
  - **COMPETITIVE SAFEGUARDS**
  - **INTERCONNECTION**
  - **UNIVERSAL SERVICE**
  - **LICENSING**
  - **REGULATOR INDEPENDENCE**
  - **SCARCE RESOURCE ALLOCATION (E.G., NUMBERS, SPECTRUM)**

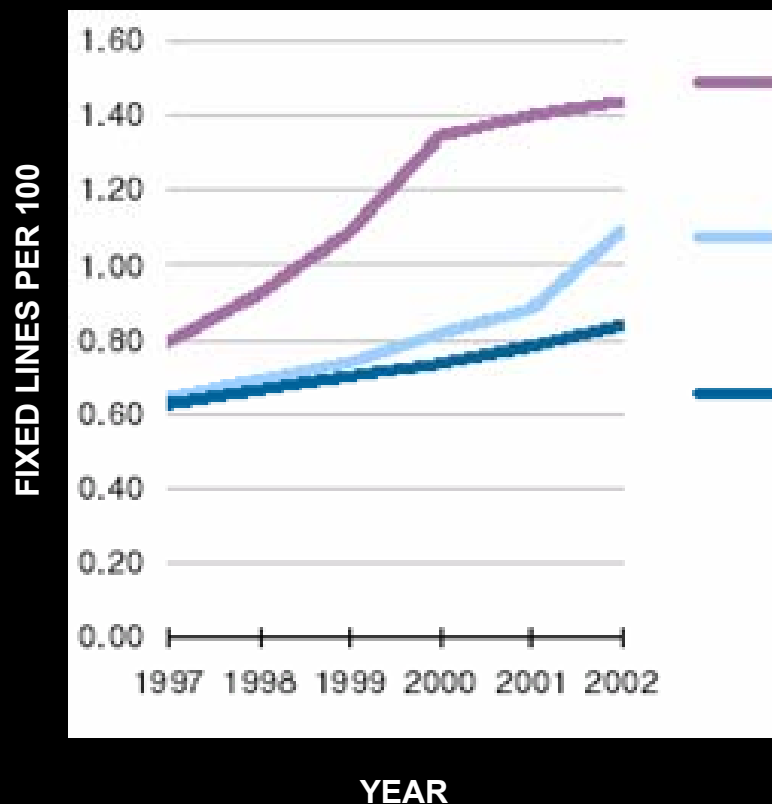
# **WHY GATS COMMITMENTS IN TELECOMMUNICATIONS SERVICES ARE UNIQUE**

- **GATS COMMITMENTS IN TELECOMMUNICATIONS ENTAIL COMPLEX DOMESTIC SECTORAL REFORMS, INCLUDING THE INTRODUCTION OF COMPETITION AND THE ESTABLISHMENT OF AN EFFECTIVE REGULATOR AND REGULATIONS**
- **FUNCTIONS AS A MULTILATERAL INVESTMENT AGREEMENT, GRANTING RIGHTS TO THE SERVICE SUPPLIERS OF OTHER WTO MEMBERS, ALLOWING SOME FOREIGN OWNERSHIP AND CONTROL IN TELECOMMUNICATIONS**
- **WTO REFERENCE PAPER FUNCTIONS AS A MULTILATERAL AGREEMENT REGARDING COMPETITION REGULATION, IMPOSING A COMMON SET OF PRO-COMPETITIVE REGULATORY PRINCIPLES**

# **WHY GATS COMMITMENTS IN TELECOMMUNICATIONS MATTER TO DEVELOPING COUNTRIES**

- **COMMITMENTS FUNCTION AS A WELL-KNOWN SIGNALING DEVICE TO INVESTORS AND FOREIGN SERVICE SUPPLIERS**
- **COMMITMENTS CAN CREATE MOMENTUM FOR FURTHER DOMESTIC SECTOR REFORM, AND IT CAN ALSO ANCHOR THOSE REFORMS WITHIN AN INTERNATIONAL LEGAL FRAMEWORK TO GUARD AGAINST POLICY REVERSAL**
- **DEPENDING ON SPECIFICS, COMMITMENTS COULD PROMOTE CONSUMER WELFARE AND TELEDENSITY, COMPETITION, AND PRIVATIZATION INITIATIVES**

# EFFECT OF WTO ON GROWTH OF FIXED LINES IN SUB-SAHARAN AFRICA



WTO TELECOMS  
COMMITMENT  
(ALL PRIVATIZED)

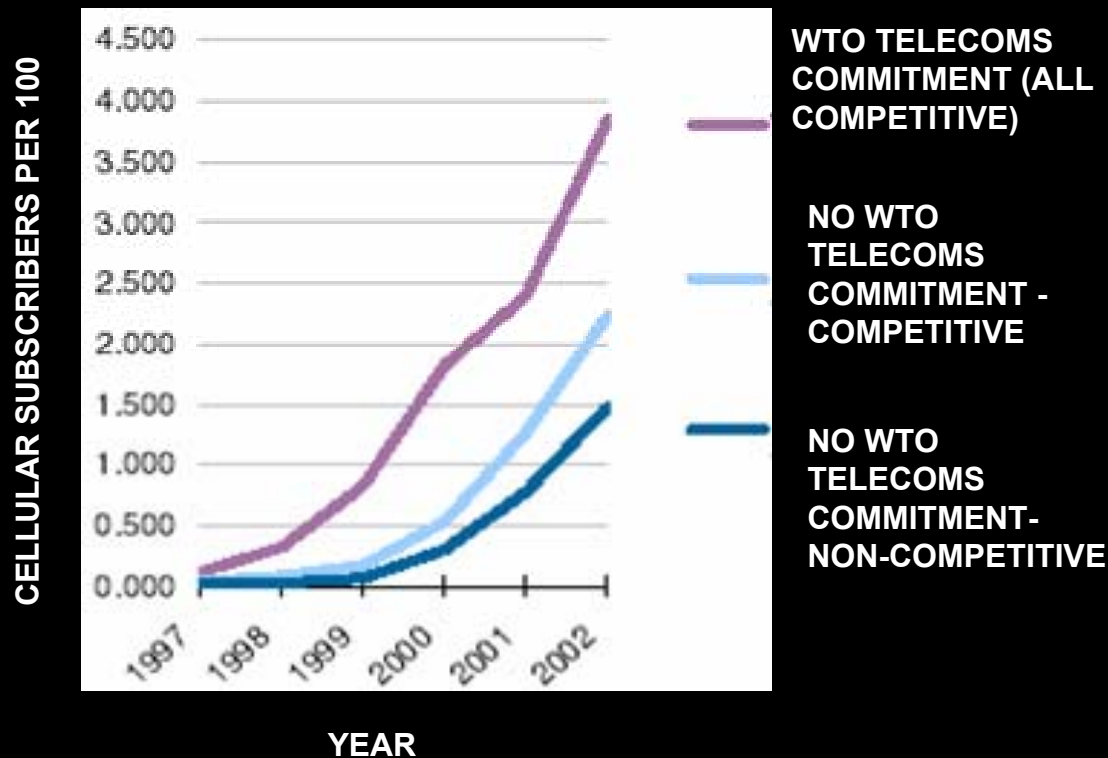
NO WTO  
TELECOMS  
COMMITMENT -  
PRIVATIZED

NO WTO  
TELECOMS  
COMMITMENT -  
NOT PRIVATIZED

- **COUNTRIES WITH WTO TELECOMS COMMITMENTS PERFORM BETTER**
  - **GREATER FIXED LINE PENETRATION**
  - **FASTER GROWTH**
- **COUNTRIES WITHOUT BASIC TELECOM COMMITMENTS HAVE GREATER FIXED LINE PENETRATION IF THE INCUMBENT IS PRIVATIZED**

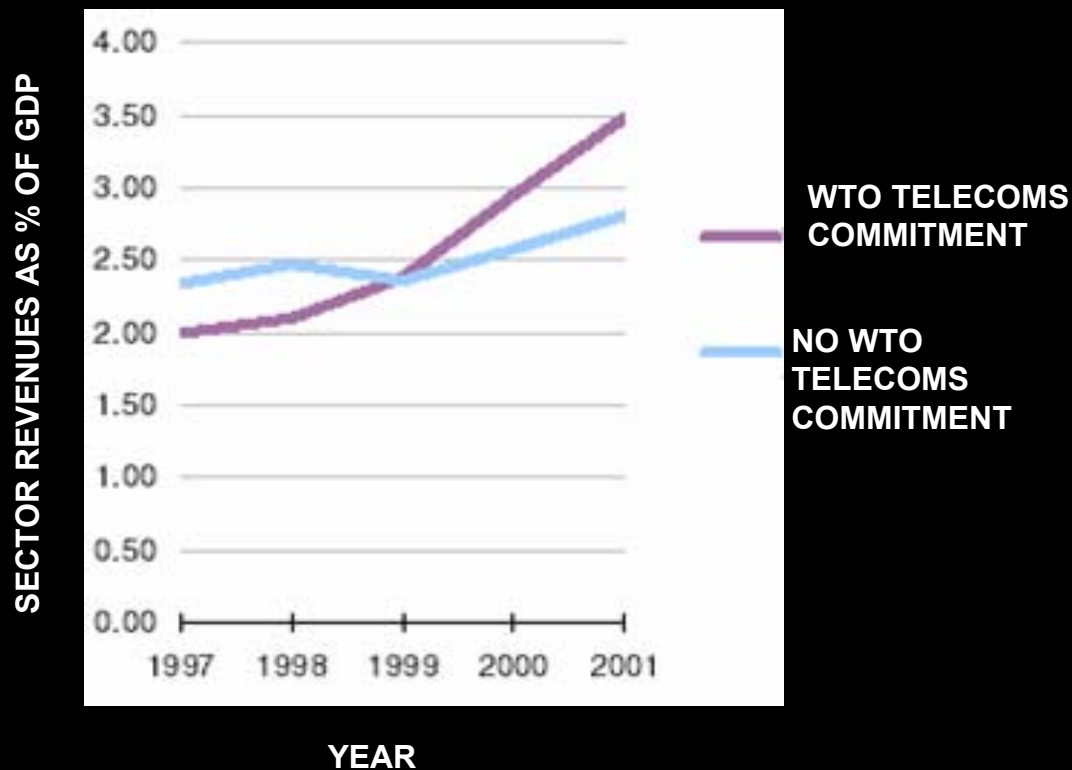


# EFFECT OF WTO ON GROWTH OF MOBILE LINES IN SUB-SAHARAN AFRICA



- COUNTRIES WITH BASIC TELECOM COMMITMENTS HAVE GREATER MOBILE SUBSCRIPTION
- COUNTRIES WITHOUT BASIC TELECOM COMMITMENTS HAVE GREATER PENETRATION IF THERE IS COMPETITION IN MOBILE

# EFFECT OF WTO ON REVENUES IN SUB-SAHARAN AFRICA



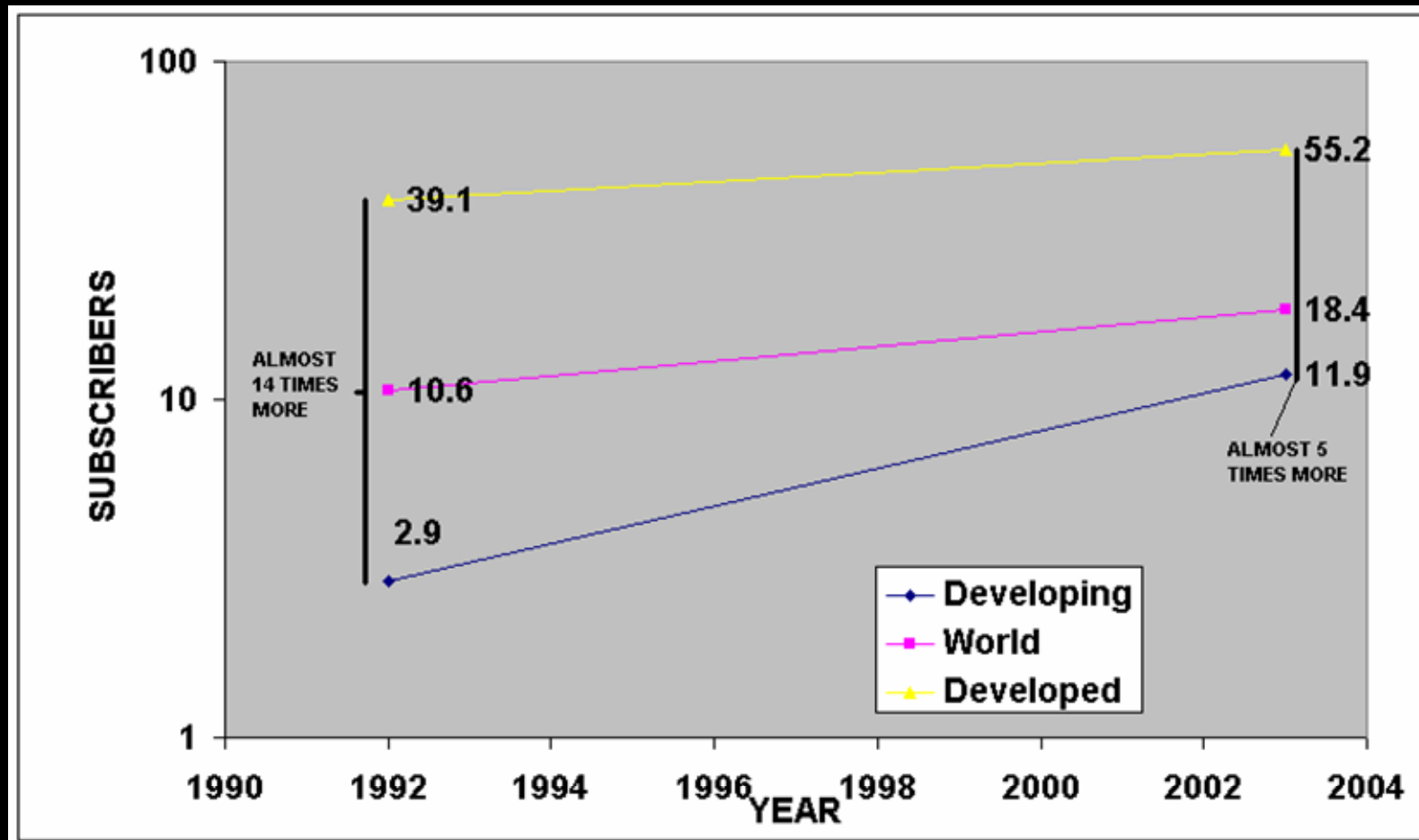
- **COUNTRIES WITH BASIC TELECOM COMMITMENTS PERFORMED BETTER**
  - **GREATER SECTOR REVENUES THAN COUNTRIES WITHOUT BASIC TELECOM COMMITMENTS**
  - **FASTER GROWTH RATES**

# WTO CONCLUSIONS

- **GATS COMMITMENTS ACT AS A MECHANISM FOR A COUNTRY TO ATTRACT MORE PRIVATE SECTOR INVESTMENT**
- **GATS COMMITMENTS CORRELATE WITH BETTER PERFORMANCE IN THE TELECOMMUNICATIONS SECTOR – MORE RAPID GROWTH IN FIXED-LINE PENETRATION, MOBILE SUBSCRIBERSHIP, AND TELECOMMUNICATIONS-SECTOR REVENUES**
- **AS EXISTING COMMITMENTS ARE FURTHER IMPLEMENTED AND NEW COMMITMENTS ARE MADE, MORE REFINED METRICS WILL BE AVAILABLE TO FURTHER SUPPORT THESE FINDINGS**

# GLOBAL FIXED PHONE LINE ACCESS

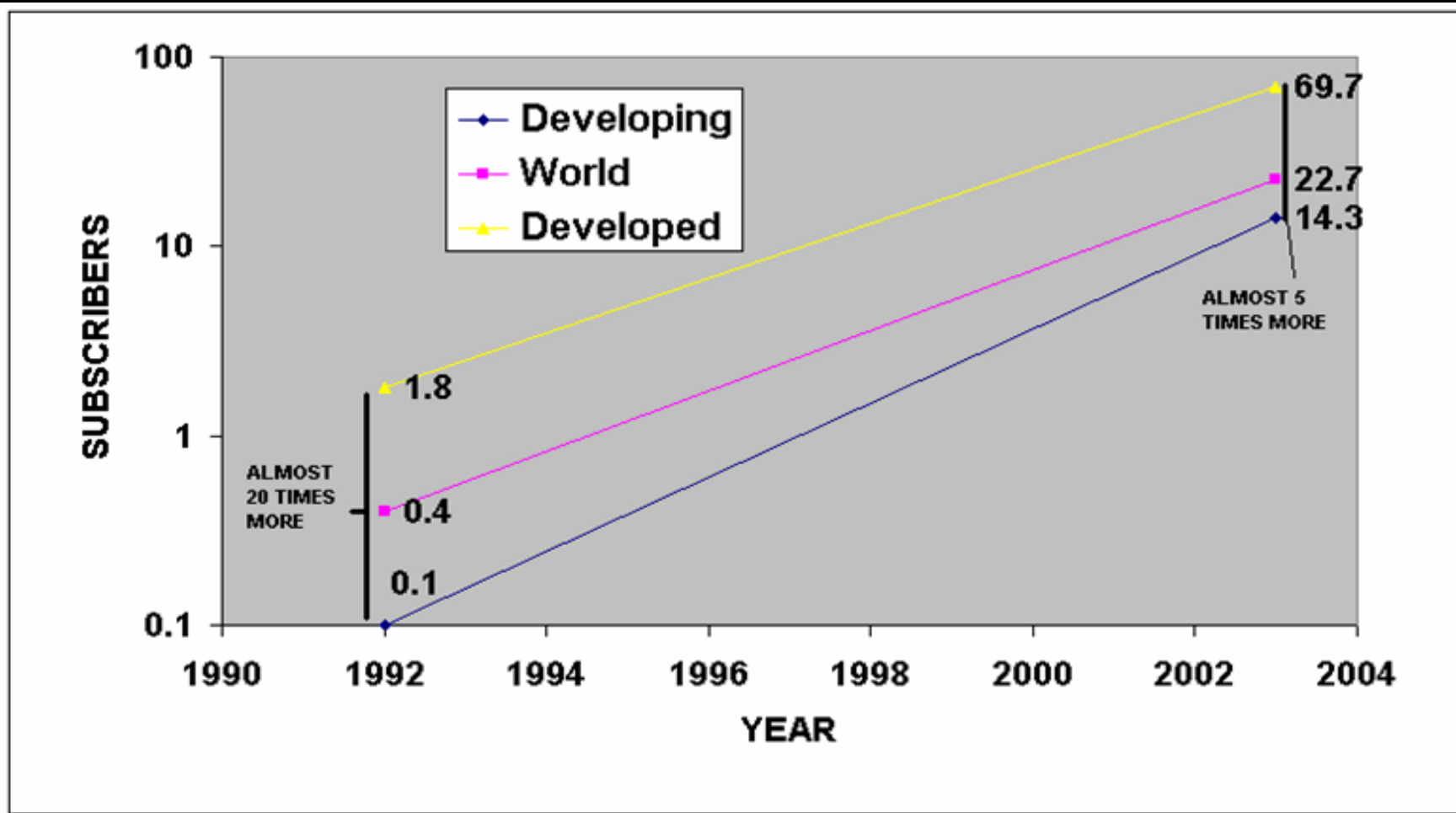
## FIXED TELEPHONE LINES PER 100 INHABITANTS



SOURCE: ITU 2005

# GLOBAL MOBILE SUBSCRIBERS

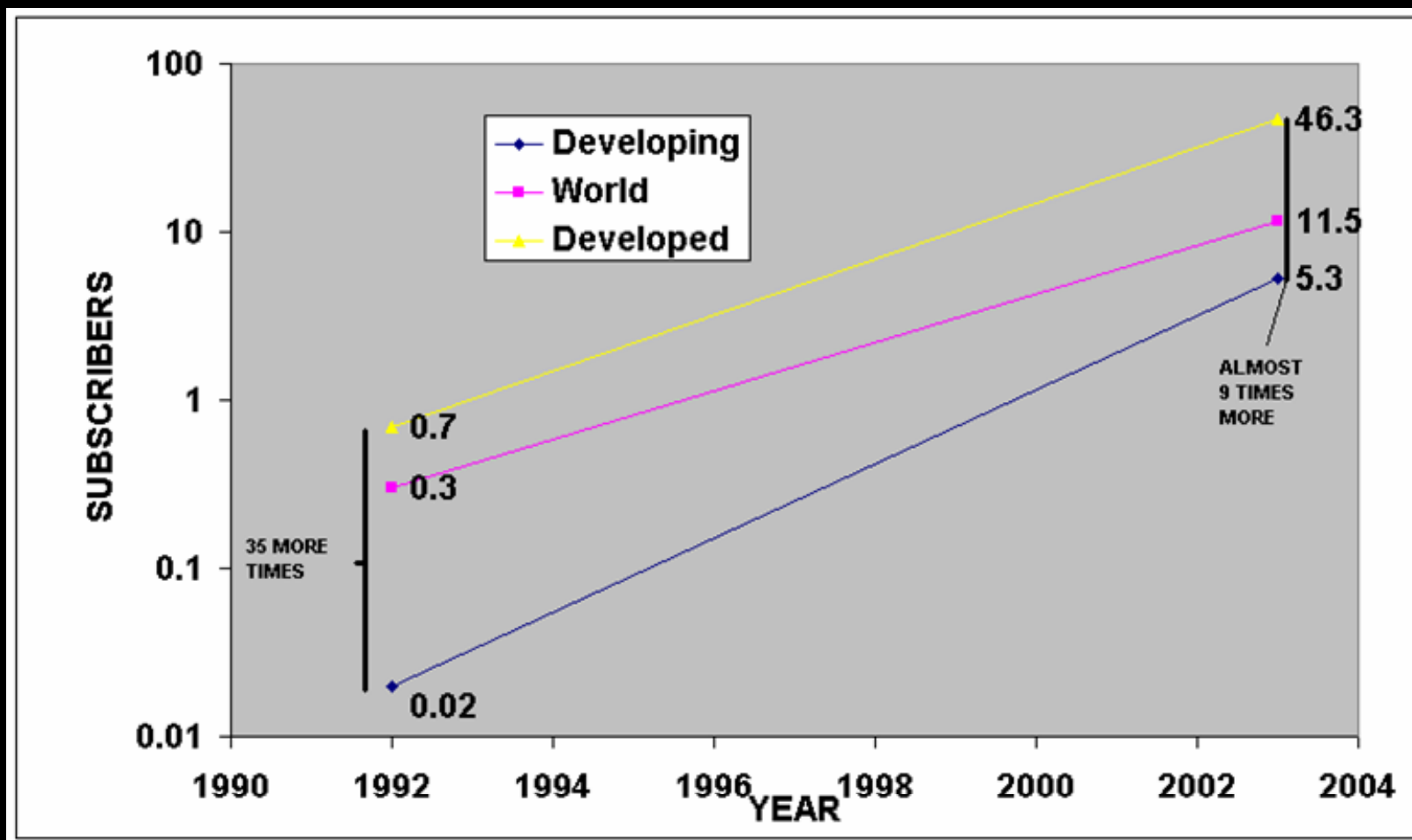
## MOBILE TELEPHONE SUBSCRIBERS PER 100



SOURCE: ITU 2005

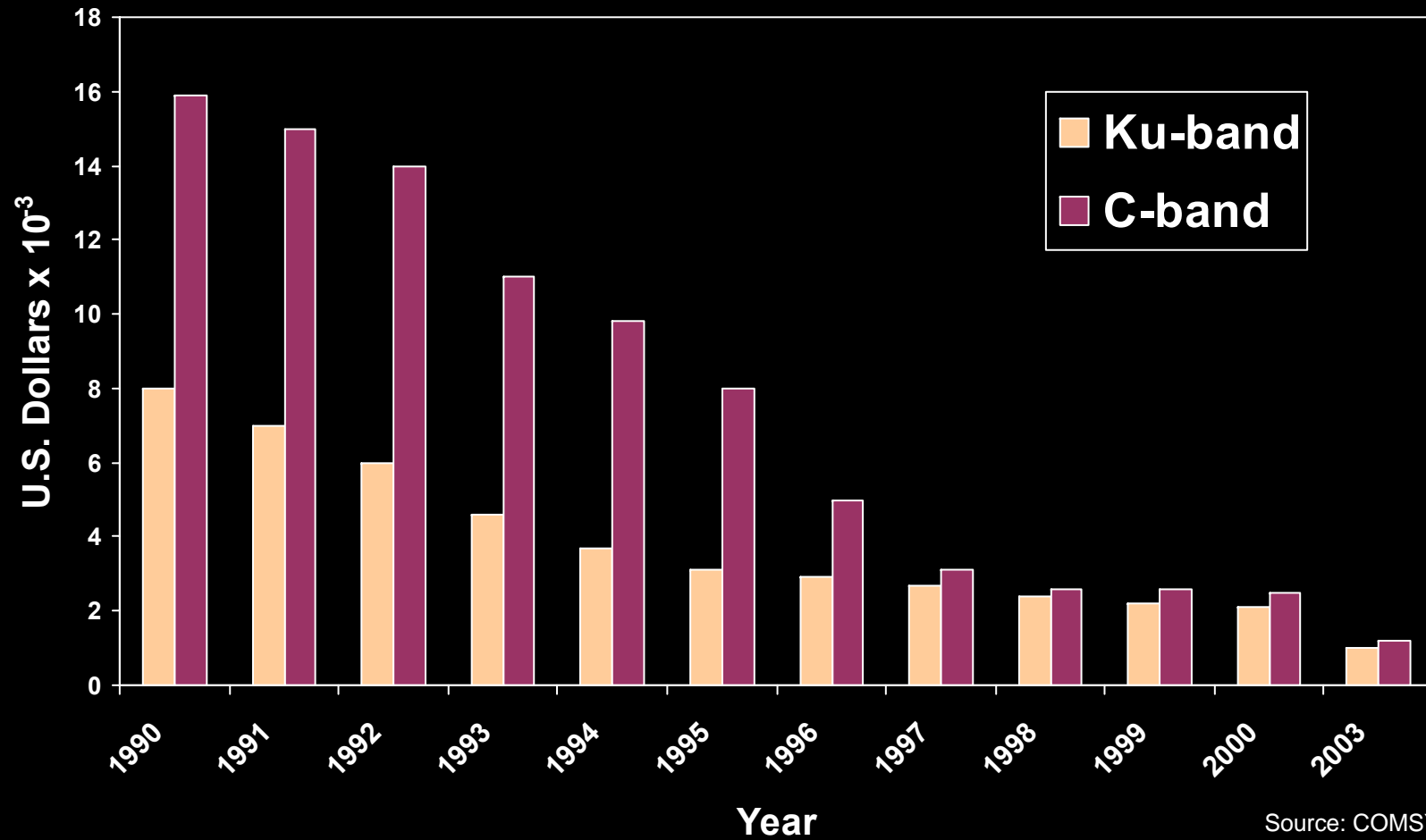
# GLOBAL INTERNET ACCESS

## INTERNET USERS PER 100 INHABITANTS



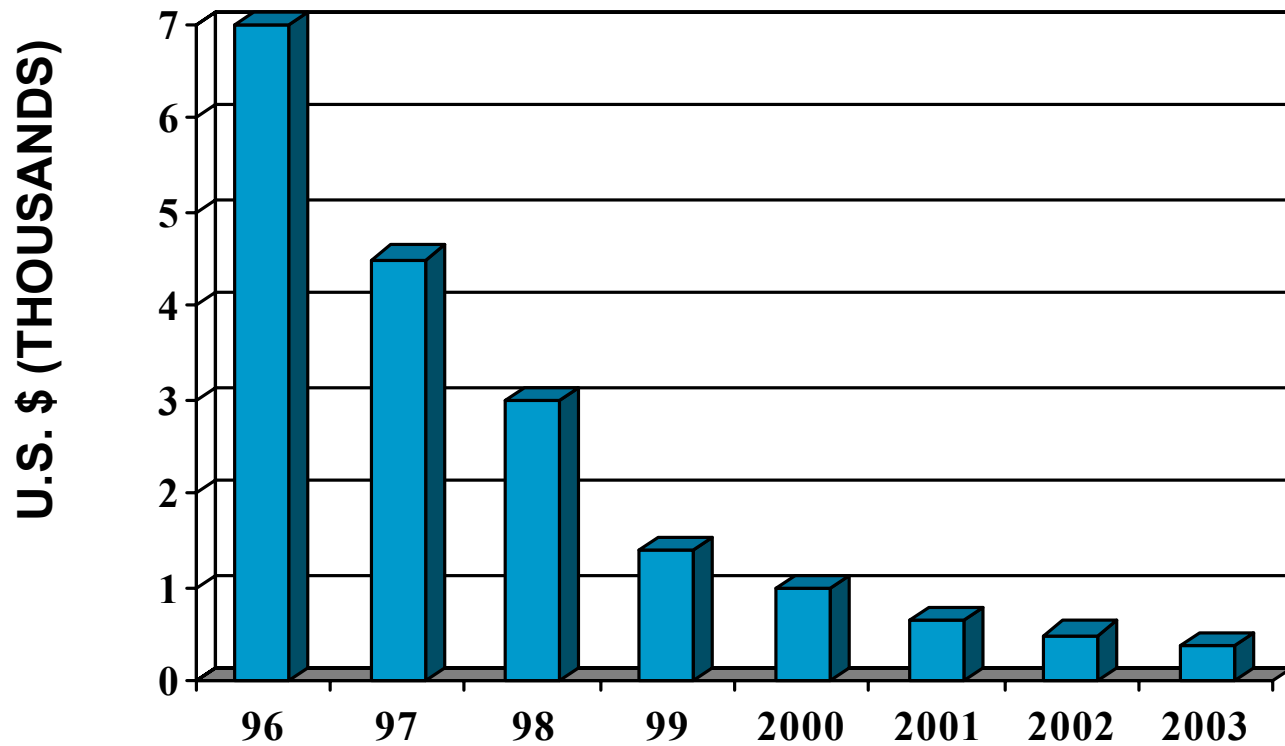
SOURCE: ITU 2005

# VSAT TERMINAL PRICING TRENDS



Source: COMSYS

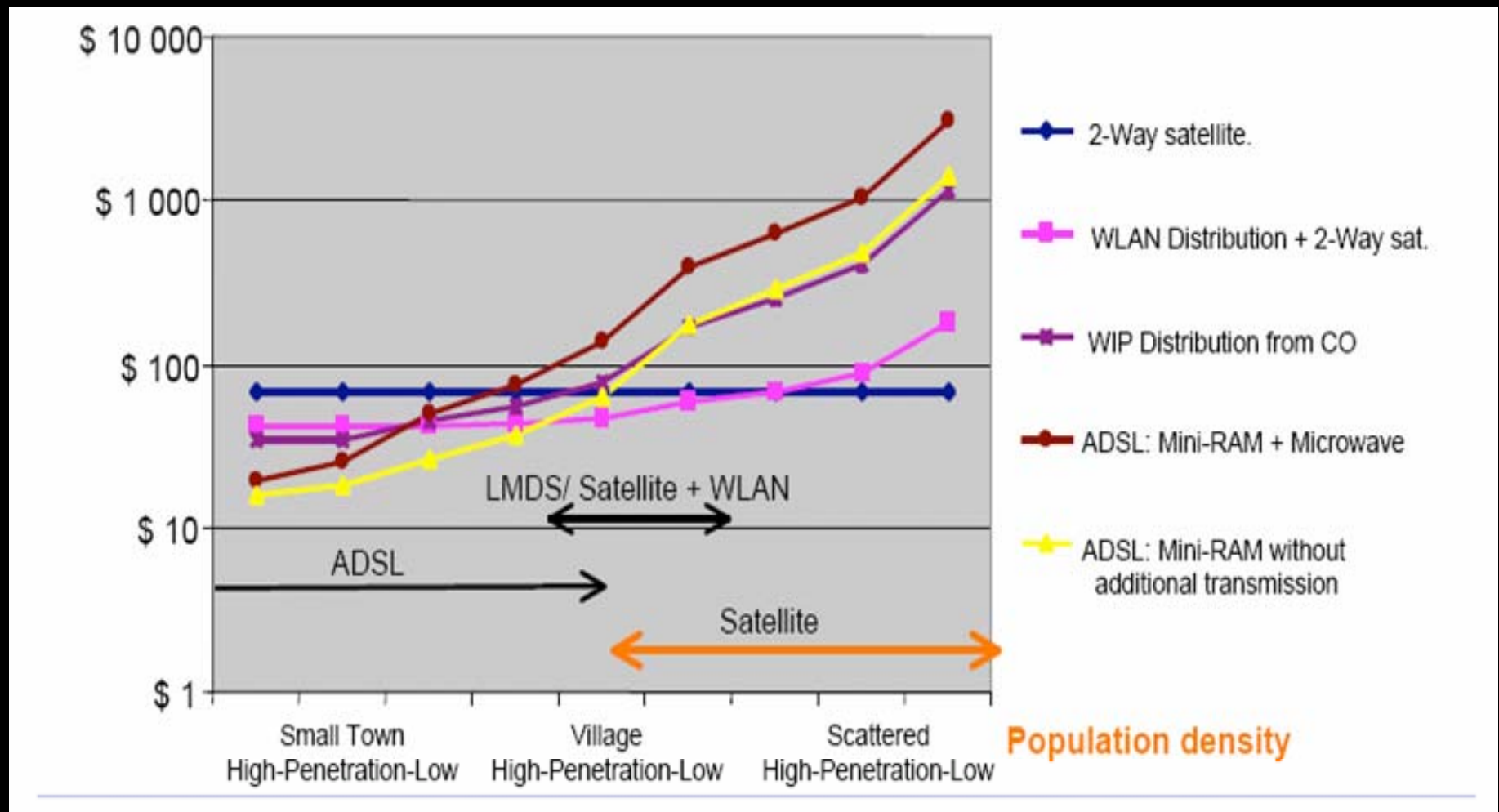
# MOBILE SATELLITE TERMINAL COST TREND



SOURCE: INMARSAT



# 2005 RESIDENTIAL COST COMPARISON



Source: Conseil Stratégique des Technologies de l'Information

# ***COMPROMISE***

**“ALL GOVERNMENT, INDEED  
EVERY HUMAN BENEFIT  
AND ENJOYMENT, EVERY  
VIRTUE, AND EVERY  
PRUDENT ACT, IS FOUNDED  
ON *COMPROMISE* ...”**

**- Edmund Burke -**

***Irish philosopher, 1775***