



A Consultative Document

Revised Draft Interconnection and Access Policy, Government of the Republic of Trinidad and Tobago

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Maintenance History		
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October 11, 2004	First Draft	0.1
March 31, 2005	Revised Draft	0.2
June 1, 2005	McCarthy Tétrault commentary	0.3
June 14, 2005	Minor changes	0.4

1 Introduction

1.1 Scope

The precursor to this document was posted on the website of Ministry of Public Administration and Information and comments were received from the public. Those comments were given due consideration in the recast of this document. This revised version is intended to serve as a basis for further consultation with existing and potential operators and other stakeholders in the telecommunications sector. It must therefore be noted that this revised draft will be the final working document on which public contributions will be considered prior to submission of policy recommendations to the Minister. For ease of identification, policy statements in this document have been numbered and highlighted in boxes.

1.2 The Consultation Process

This revised draft will be available for consultation in accordance with *The Procedures for Consultations in the Telecommunications Sector of Trinidad and Tobago*, which is available on the Authority's website <http://www.tatt.org.tt>. The duration for receipt of public comments on this document shall be prescribed by the Authority. Comments may be submitted by email to: policy@tatt.org.tt or to the Policy Unit of the Authority (# 76 Boundary Road, San Juan). After consideration of all comments and recommendations, the Authority reserves the right to determine the final policy proposals to be submitted to the Minister.

2 Background

2.1 Dynamics of Global Market Structure

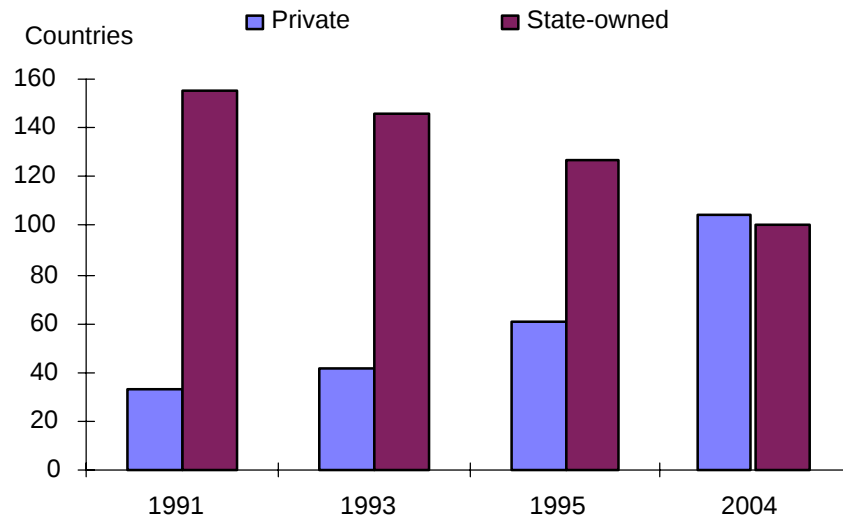
Telecommunications is a key component of the infrastructure for economic growth, supporting activities and trade in sectors ranging from manufacture to financial services. By the turn of the 21st century, telecommunications network solutions combined with broadcasting and computing platforms to reconfigure the information and communication technology (ICT) sector.

Changes in the international telecommunications market structure have been, and continue to be, driven by privatization and competition. Control of the industry, which was defined by wholly state-owned capital, is now subject to significant privatization. By the end of 2004, approximately 75% of countries in the Americas had private capital injected into incumbent telcos. The percentages for Europe, Asia, Africa and the Arab states were approximately 71%, 55%, 44% and 38% respectively. Figure 1 shows that on average more than 50% of incumbent telcos have private ownership.

The tendency toward privatization has been matched by the move towards competition in the delivery of a variety of telecommunications services. Approximately, 70% of fixed line subscribers now have a choice of service provider. The approximate percentages for mobile telephony and Internet subscribers are 98% and 99% respectively (Figure 2). Competition in the provision of cable TV, VSAT terminals and wireless local loop services apply to approximately 90%, 78% and 68% respectively, of the 169 ITU member countries (ITU).

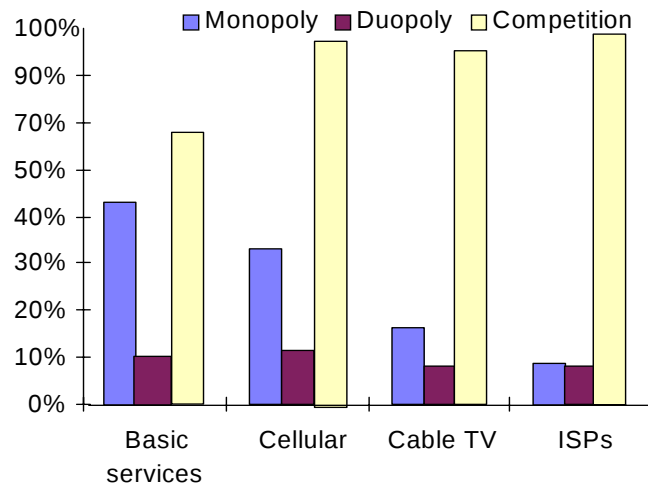
Voice telephony traffic has evolved from a monopolistic to a competitive delivery system. At the end of 1995, less than twenty (20) countries authorized competition in local, long distance and international traffic. By the end of 2004, approximately 75 countries authorized competition in all three services. It is estimated by that the end of 2005 some 90 countries will be offering competitive markets for those services.

Figure 1
Ownership Status of the Incumbent



Source: ITU Telecommunication Regulatory Database.

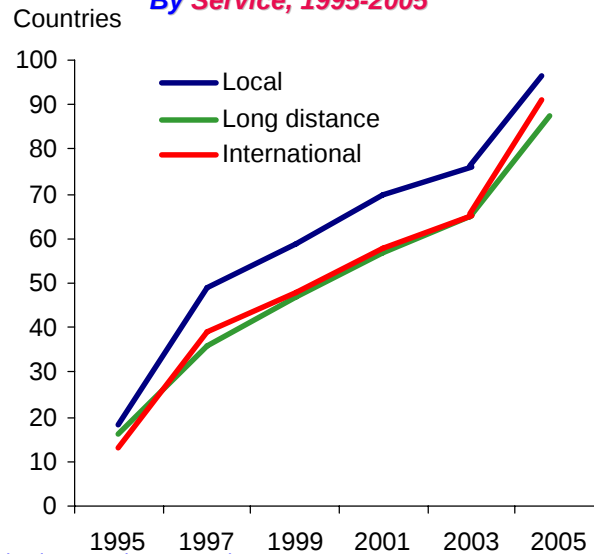
Figure 2
Degree of Competition by Service, (ITU Member States)



Source: ITU Telecommunication Regulatory Database.



Figure 3
Competition:
By Service, 1995-2005



Source: ITU Telecommunication Regulatory Database.

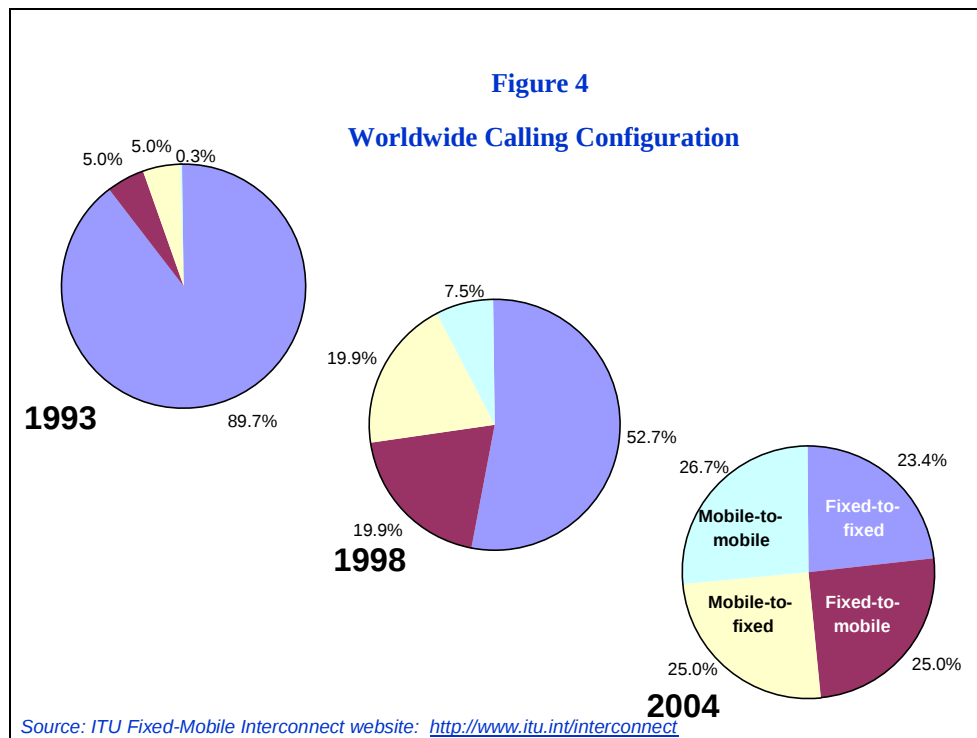
2.2 Mobile Revolution

There has been a strong correlation between competition, initiated through interconnection, and the mobile revolution, particularly in emerging economies. Over the period 1999-2004, emerging economies demonstrated strong growth rates in mobile subscribers. The compound average growth rate in mobile subscribers in Eastern Europe (1999-2004) was three times higher than that for Western Europe. Over a similar period, the mobile growth rates in African and Middle Eastern countries were significantly higher than that for Asia Pacific. While the compound average growth rate in mobile subscribers for North America was significantly below the global average of 31%, above global average growth rates were recorded in Latin American and Caribbean countries. **In fact, for the period 1999-2004 the fastest growth rate in mobile subscribers in the Western Hemisphere was recorded in the Caribbean.**

The buoyancy of the Caribbean mobile market has not escaped the focus of some of the largest mobile operators in the world including Orange, Telefonica Moviles, Verizon

Wireless and Cingular/AT&T Wireless. The small landmass combined with relatively high per capita income and preference for western life styles makes Caribbean countries an attractive market for multi-media mobile services.

The inter-networking, and hence competition, among mobile service providers has impacted worldwide call configuration substantially over the 1993-2004 period. At the end of 1993, merely 10 % of total calls involved use of mobile handsets. The estimated percentage at the end of 2004 is 77%, marking a 66 percentage-points increase over the 10 year period (Figure 4).



Over the period 1991-2004, world telecommunications revenue increased substantially from approximately USD 963 billion to an estimated USD 2.5 trillion, an average annual growth rate of some 8.4%. Despite the sluggish growth rates in earnings from international services (5.29 %) and domestic voice telephony services (2.82%), growth in telecommunications revenue was sustained by the robust increases in returns from data (12.08%) and mobile services (29.9 %) - see Tables I and II.

Table I

World Telecommunications Revenue (\$US billions)

Year	Service & Equipment	Fixed-line (Domestic)	International	Mobile	Data
1991	523	331	37	19	53
1992	580	350	43	26	72
1993	605	359	46	35	77
1994	675	386	47	50	81
1995	779	428	53	78	89
1996	885	444	53	114	114
1997	946	437	54	142	133
1998	1015	456	56	172	139
1999	1123	476	58	223	155
2000	1210	477	60	278	165
2001	1232	472	63	317	180
2002	1295	465	65	364	190
2003	1370	455	68	414	200

Source ITU

Table II

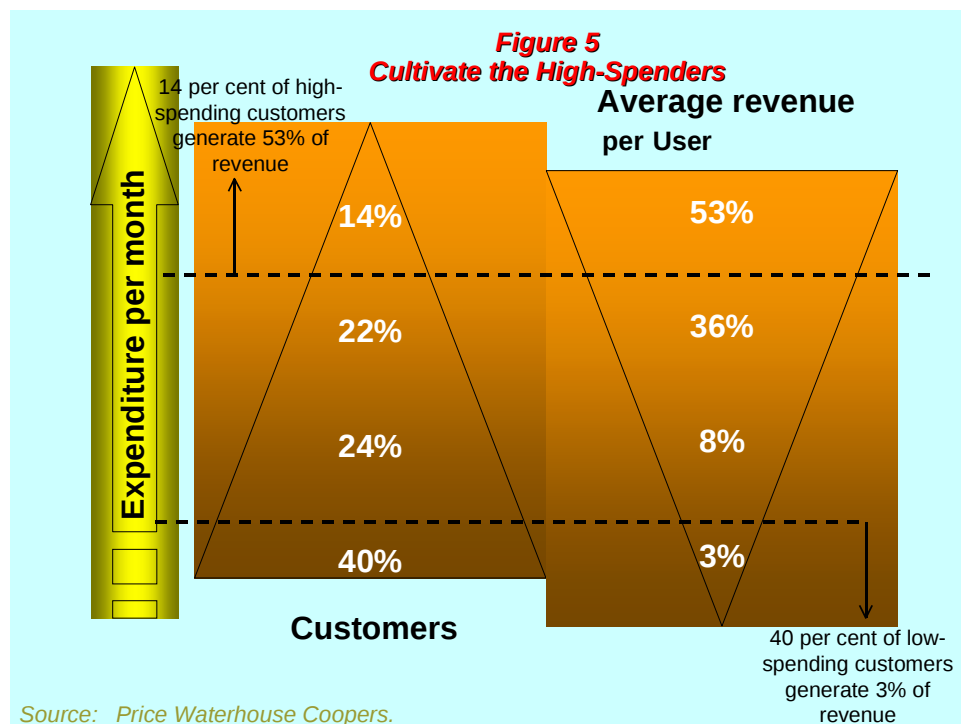
Average Annual Growth Rates, Telecommunications Industry

Year	AGR Equipment & Services	AGR Fixed-line Domestic	AGR International	AGR Mobile	AGR Data
1992	10.90	5.74	16.22	36.84	35.85
1993	4.31	2.57	6.98	34.62	6.94
1994	11.57	7.52	2.17	42.86	5.19
1995	15.41	10.88	12.77	56.00	9.88
1996	13.61	3.74	0.00	46.15	28.09
1997	6.89	-1.58	1.89	24.56	16.67
1998	7.29	4.35	3.70	21.13	4.51
1999	10.64	4.39	3.57	29.65	11.51
2000	7.75	0.21	3.45	24.66	6.45
2001	1.82	-1.05	5.00	14.03	9.09
2002	5.11	-1.48	3.17	14.83	5.56
2003	5.79	-1.48	4.62	13.74	5.26
Average	8.42	2.82	5.29	29.92	12.08

Revenue from mobile services increased from USD 19 billion in 1991 to USD 414 billion at the end of 2003, closing the gap on total earnings from fixed-line domestic telephone services, including Fax.

The popularity of mobile telephony has been buoyed by relatively fast network rollout, the introduction of roaming and calling party pay (CPP). Moreover, mobile phones are personal and have attracted a younger user population than the average fixed line subscriber population, without any loss of patronage from high spending consumers. The Canadian situation captured at Figure 5 reflects the sharp disparity in expenditure on mobile services between low-income and high-income subscribers. This indicates the importance of minutes of usage by mobile subscribers as a determinant of the revenue earning potential of mobile service providers.

Text messaging (SMS) has also contributed significantly to the expansion of the mobile industry. Estimates of the Mobile Data Association (MDA) show that more than 800 billion mobile text messages were exchanged in 2003. China was responsible for approximately 380 billion of those messages. ITU estimated that the number of text messages in China reached some 550 billion at the end of 2004.



Serious regulatory implications have attended the transformation of the voice telephony market. Policy makers and regulatory authorities have been forced to grapple with the

rapidity with which policy revisions are required to facilitate new dimensions in licensing service providers to satisfy the reality of technology and service neutrality.

2.2.1 Outlook

Indications are that in the next few years, the mobile voice telephony market will require significant new investment to support the migration towards 2.5G and maturing 3G technologies. Mobile network operators will also reap further benefits through investment in VAS, including MMS and SMS services, particularly in China, India, Latin America and the Caribbean.

The dynamics of the mobile market in the Caribbean are likely to force consolidation among network and service providers. The economic viability of four and five mobile service providers, as obtains in Jamaica, Barbados and the Dominican Republic will be challenging. The lessons of reduction to a maximum of three (3) mobile operators in larger economies such Argentina and Chile is likely to be repeated in certain countries of the Caribbean. As mobile markets become more competitive, it is not inconceivable, in the near future, to witness small operators that obtained mobile concessions and licences via beauty contests joining with, or taken over by, operators with much larger footprints. The near-term battle for market dominance in the Caribbean is likely to be contested among Verizon, Cable and Wireless, Cingular/AT&T Wireless, Digicel, Centennial and Orange Dominicana. As the lucrative Trinidad and Tobago market opens up and further liberalization of the Cuban market takes effect, the larger global players including Telefonica, Cellular One, Western Wireless, Telecom Italia, Oceanic Digital, Sprint and Tricom (Motorola) are likely to emerge, either as first time or secondary licensees.

Capital expenditure on mobile services, particularly in the Caribbean region is likely to experience accelerated growth over the near term. Pyramid Research forecasts that GSM will drive 60% of operator spending in 2005 with CDMA and WTDMA accounting for 22% and 18% respectively. It is likely that GSM will continue to dominate global expenditure on mobile infrastructure for some years to come. However, the expansion of EVDO (Evolution Data Optimised) worldwide, particularly in the USA will lead to

increase in spending on WCDMA. Given the current slower-than-expected migration of subscribers to 3G WCDMA, mobile operators are likely to invest in replacement of their aging 2G GSM networks. GSM is likely to maintain its share of global subscribers at approximately 68% causing operators to continue investment in new GSM networks, especially to incorporate EDGE capabilities.

Longer term, the need for greater bandwidth to satisfy mass E-transactions for business and pleasure will encourage rollout, not only in 3G mobile networks but to facilitate the emergence of 4G and 5G networks. By necessity, interconnect policies will be altered to treat with seamless passage of traffic among these new networks.

New services and applications will emerge in the future. At present it is unclear what these will be, but examples may include services which permit parents the option of constant video contact with their children at any time of the day, even in classrooms through CCTV. Via sensors on mobile phones, doctors will be able to check certain vital signs in patients such as blood pressure, temperature, glucose levels and pulse rate, thereby reducing the length of time patients will spend during a doctor's visit.

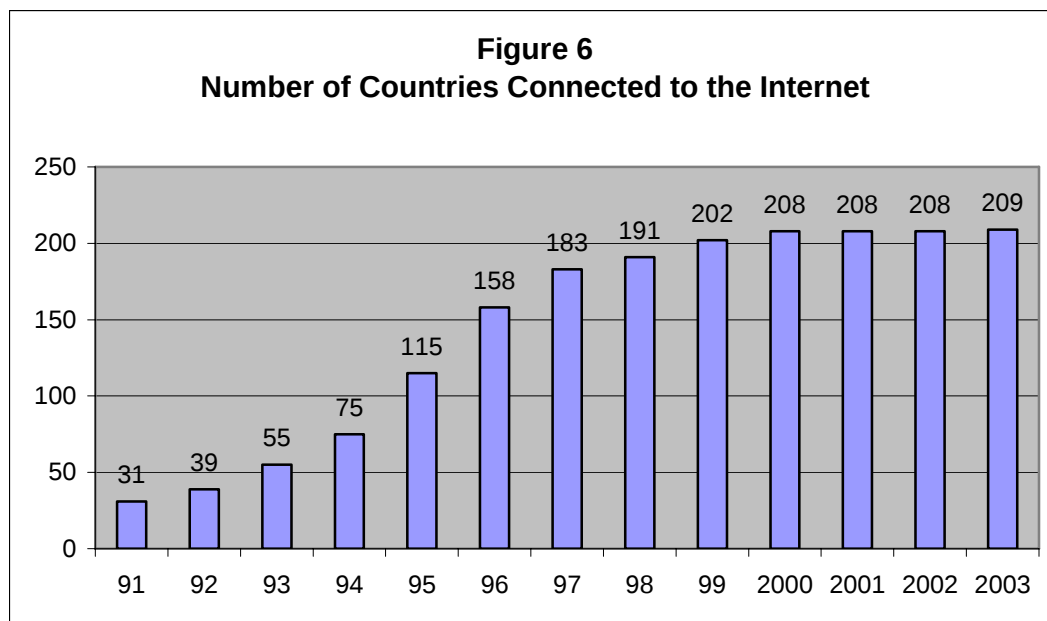
There will also be an emergence of new mobile technologies. Long range, medium range and short range technologies such as (WiMAX –IEEE 802.16, IEEE 802.20, HiperMAN, LMDS, MMDS) (long range); (WILAN – WiFi: IEEE 802. 11b, IEEE 802. 11a, IEEE 802. 11g, IEEE 802. 11i, Free space optics, HiperLAN2, Ultra wideband (medium range) and (Bluetooth, RFID, Zigbee) short range will alter multimedia network rollout time and cost. Typical advancements envisage a capacity to use mobile phones to direct and countermand household activities while on the roads.

2.3 On-line Access to Information.

The fixed-line network is far from spent. DSL technology has revitalized the importance of copper by facilitating dedicated quantum of bandwidth on copper pairs that do not vary with the number of subscribers, as is the case with CTV and wireless technologies that

are susceptible to congestion within certain usage-allotted bandwidth ratios in a particular area. The future of DSL in the local loop is contingent on the speed and extent at which regulators introduce interconnection in the local loop.

The number of countries connected to the Internet increased almost seven-fold over the period 1991-2003 (Figure 6). The global on-line population for year-end 2003 stood at 675,677,700 as against 387,531,400 at year-end 2000, an average annual growth rate of approximately 20% (Tables III & IV).



Source: compiled from ITU World Telecommunication Data Base

Table III

Estimated Internet Users				
Region	2003	2002	2001	2000
Africa	12 112 600	7 942 800	6 510 200	4 558 700
Americas	219 327 400	205 658 500	182 986 000	154 643 900
Asia	243 405 900	201 079 000	150 471 500	109 256 900
Europe	188 996 800	166 386 500	143 915 200	110 824 300
Oceania	11 825 000	10 500 400	9 141 100	8 247 700
World Total	675 677 700	591 567 200	493 024 000	387 531 400

Source: ITU, <http://www.int/itu-D/ict/statistics/>

As illustrated at Figure 7, Asia, with approximately 36% of the global Internet population is the leading region in internet access. Africa and Oceania account for approximately 4% of the total global on-line population as against 64% for Europe and the Americas combined. It should be noted however, that while the average global growth rate in on-line population is estimated at 20%, Africa's growth is estimated at 39% (Table VI).

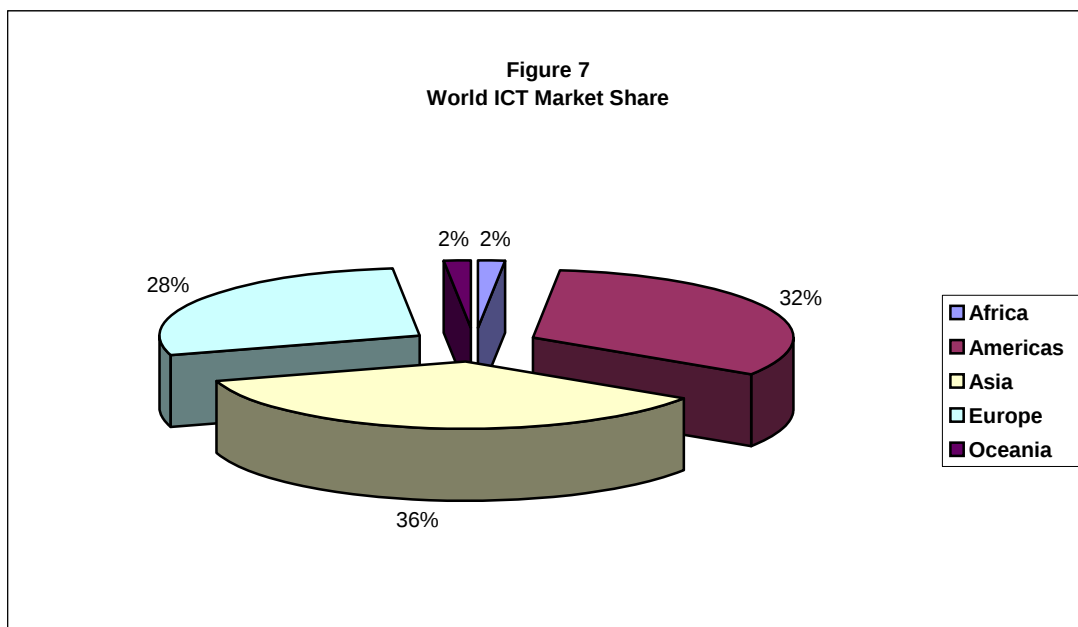


Table IV % Change in Estimated Internet Users				CAGR
Region	2003	2002	2001	
Africa	52.3	22	43	39.1
Americas	6.6	12.4	18.3	12.4
Asia	21	33.6	37.8	30.8
Europe	13.6	15.5	30	19.7
Oceania	13	15	11	13
World Total	14.2	20	27.2	20.5

These positive signs notwithstanding, the digital gap remains very expansive: thirteen (13) of the most developed countries of the world account for some 461,000,000 of the 675,677,700 (68%) global Internet users. The number of personal computers per 100 inhabitants in developing countries is still 11 times lower than the figure recorded for the developed world. The number of Internet users per 100 inhabitants in developing vis-à-vis developed countries is not yet within a ten-fold difference (ITU).

The **Millennium Declaration** signed by 189 countries seeks to promote connectivity to enable the delivery of artisan training using broadband solutions as a means of assisting in the reduction of rural migration for purposes of accessing comparable training. Similarly, the declaration seeks to use the Internet as a rapprochement of socio-economic disparities between the developed and developing worlds.

In a connected world government departments cannot escape the application of Internet solutions to satisfy public expectation in terms of efficient access to public services. The pervasive availability of Internet service in government departments will assist significantly in instituting a new social dimension based on public servants bringing on-the-job-acquired ICT skills to their respective communities.

2.3.1 Access to Broadband Technologies

One school of thought classifies broadband as technologies of capacity greater than 256 Kbit/s. Others opine that broadband capacity begins at 100 Kbit/s. Among technologies that enable broadband capacity are:

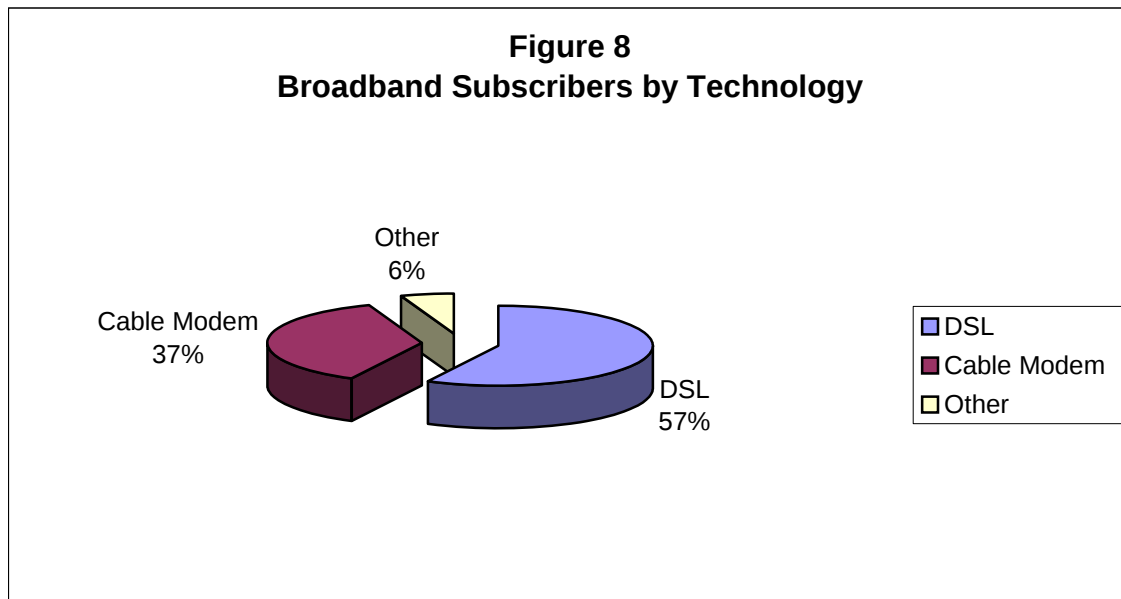
- Digital subscriber lines (copper phone lines)
- Cable Modem (copper coax)
- Fiber optical cable
- WLAN
- Fixed broadband wireless (e.g. IEEE 802.16)

- Satellite
- Free space optics (lasers)

These technologies permit affordable, always-on-high-speed connectivity to the Internet, facilitating:

- | | |
|-------------------------|--------------------------|
| o Fast web browsing | E-Health/Telemedicine |
| o VOIP | Telenetworking |
| o Audio | E-Education |
| | |
| o Video | E-Government |
| o Online photo exchange | Video Conferencing |
| o Internet gaming | Faster E-Commerce , etc. |

The two most widely used broadband technologies are DSL and cable modem, comprising 57% and 37 % respectively of world broadband subscribers (2004), Figure 8. DSL involves splitting of voice and data services over different frequencies enabling more efficient use of bandwidth available through compression.



Source: ITU and OECD

Cable modem is the most widely used broadband technology in the Americas, particularly North America where there is a fully developed cable television network. Cable networks that were initially designed for one-way video transmission have been re-engineered to upload and download information to households on separate blocks of 6 MHz frequencies using the same cable. This has made it possible for both internet and voice solutions to be transmitted simultaneously.

The number of global broadband subscribers increased dramatically from 2.3 million in 1998 to 102 million at the end of 2003, a compound average growth rate of approximately 118% (Table IV)

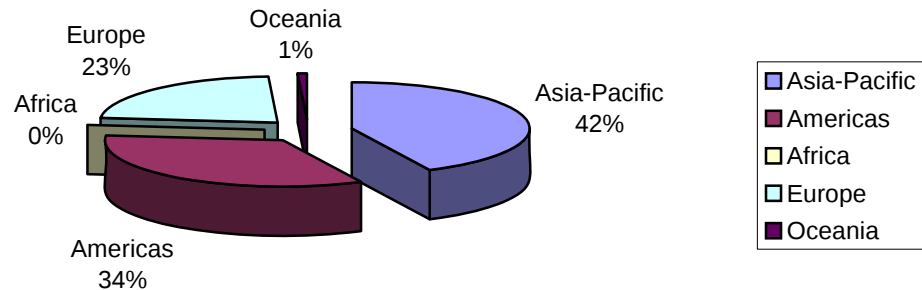
Table IV

Year	Number of subscribers (millions)	% Growth
1998	2.3	
1999	5.4	134.78
2000	12.3	127.78
2001	35.1	185.37
2002	61.4	74.93
2003	102	66.12
Average		117.80

Source: ITU

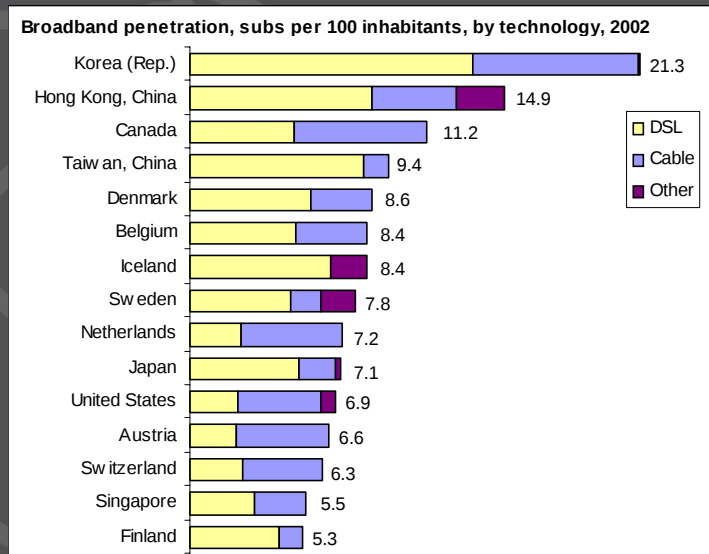
With 42.9% of the world's broadband subscriber base, Asia-Pacific leads the world in broadband users, followed by the Americas (34%) and Europe (23%). The almost negligible broadband-user population in Africa and Oceania provides a significant contrast(Figure 9).

Figure 9
World Broadband Subscribers by Region



Source : ITU & OECD

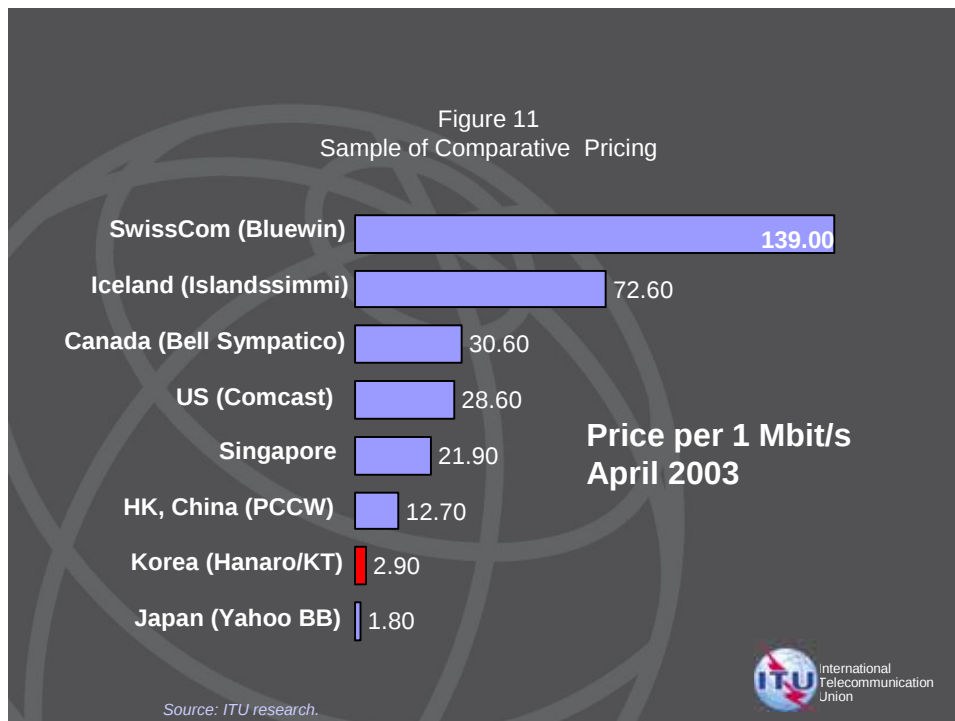
Figure 10



Source: ITU

In terms of broadband users per capita, the Republic of Korea is the leading country with a penetration rate of 21.3 per 100 inhabitants (Figure 10). The secret of Korea's broadband success is founded in its low prices and deliberate government policy to promote application of the technology as a socio- economic solution.

In a series of development plans between 1987 and 2002, the government of the Republic of Korea set out to create a cutting-edge all-inclusive knowledge-based society. One of the prime strategies was to make broadband services competitively priced to ensure affordability to the average citizen. As a consequence, the average price per Mbit/s in Korea is approximately 9 times less than that in the US and 10 times less than that faced by the average subscriber in Canada (Figure 11). At the end of 2003, the proportion of Korean homes with PCs was approximately 78% of which 86% had Internet connection. Broadband subscribers account for approximately 90% of the internet-access population.



Source: ITU

Perhaps the lessons that should not escape Trinidad and Tobago's interconnection policy are the following:

- High level competition should be promoted through interconnection in the local loop, including line sharing, to lower the cost of telecommunications technologies to homes;
- Discontinuance of all facility-based monopolies by permitting interconnection between cable television networks and the PSTN;
- Permit flexibility in competitive interconnect charges to include flat-rate charging for bundled access resources;
- Any concessionaire having a right to interconnection should only be allowed to exercise that right if the entity can provide reciprocal obligations to other concessionaires.

2.4 Universality

Universality incorporates universal access and universal service. The 1984 Maitland Commission contended that by the turn of the 21st century “every one should be within easy reach of telephone services”. Easy reach was defined as within 1-2 walking hours distance of a telephone. Said Commission also proffered that the mintage for universal service is a telephone to every house. The WTO Reference Paper recognises the right of each country to define universality to suit their respective circumstances taking into consideration the under-listed fundamentals:

Affordability- ensuring prices of basic telecommunications services are within the financial reach of the entire population, irrespective of variation in cost of providing the services due to location, terrain, climate and urban/rural distinctions.

Availability- the level and quality of basic telecommunications services should be the same, no matter the location of ones residence in a country.

Accessibility- guaranteed access to basic telecommunications services for the physically and mentally challenged.

To forward-looking societies, universality has moved from access to single line voice to functional access to information. The extent of the latter in any country may be measured by a Digital Access Index (DAI) such as has been devised by the ITU. The DAI is constructed on five critical socio-economic and technology variables: **affordability, knowledge, infrastructure, usage and quality.**

DAIs have been estimated for 178 countries. Depending on the range of the value of the indices, the countries have been classified into four grouping: High Access, Upper Access, Middle Access and Low Access. DAIs permit each country a clear perspective on its readiness to take advantage of opportunities in a dynamic global information society where welfare advancement is becoming increasingly dependent on the combination of ICT facilities and the information exploratory skills of populations.

Trinidad and Tobago, one of the stronger economies in the Sub-Americas is ranked in the Upper Access grouping, but with a DAI of only 0.53 (Table V). This means that the capability of the population to use ICT as a productive tool is below that of the Bahamas (DAI = 0.60), St Kitts & Nevis (DAI = 0.60) Antigua and Barbuda (DAI = 0.57), Barbados (DAI = 0.57) and Dominica (DAI = 0.54). It is interesting to note that all those countries are more advanced than Trinidad and Tobago in liberalizing their telecommunications markets.

Table V

Digital Access Index value, by access level, 2002

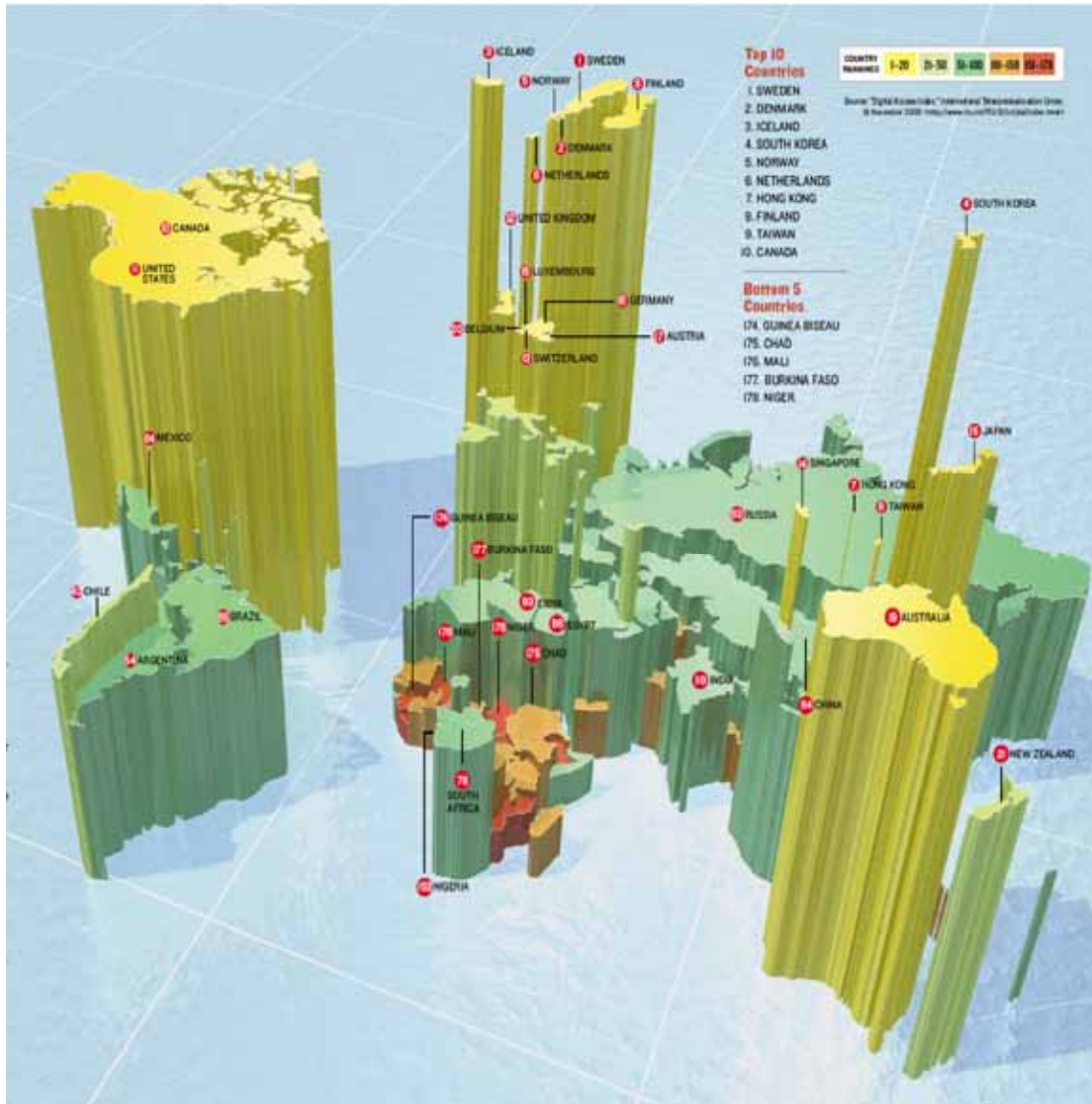
HIGH ACCESS		UPPER ACCESS		MIDDLE ACCESS		LOW ACCESS	
Sweden	0.85	Ireland	0.69	Belarus	0.49	Zimbabwe	0.29
Denmark	0.83	Cyprus	0.68	Lebanon	0.48	Honduras	0.29
Iceland	0.82	Estonia	0.67	Thailand	0.48	Syria	0.28
Korea (Rep.)	0.82	Spain	0.67	Romania	0.48	Papua New Guinea	0.26
Norway	0.79	Malta	0.67	Turkey	0.48	Vanuatu	0.24
Netherlands	0.79	Czech Republic	0.66	TFYR Macedonia	0.48	Pakistan	0.24
Hong Kong, China	0.79	Greece	0.66	Panama	0.47	Azerbaijan	0.24
Finland	0.79	Portugal	0.65	Venezuela	0.47	S. Tomé & Príncipe	0.23
Taiwan, China	0.79	United Arab Emirates	0.64	Belize	0.47	Tajikistan	0.21
Canada	0.78	Macao, China	0.64	St. Vincent	0.46	Equatorial Guinea	0.20
United States	0.78	Hungary	0.63	Bosnia	0.46	Kenya	0.19
United Kingdom	0.77	Bahamas	0.62	Suriname	0.46	Nicaragua	0.19
Switzerland	0.76	St. Kitts and Nevis	0.60	South Africa	0.45	Lesotho	0.19
Singapore	0.75	Poland	0.59	Colombia	0.45	Nepal	0.19
Japan	0.75	Slovak Republic	0.59	Jordan	0.45	Bangladesh	0.18
Luxembourg	0.75	Croatia	0.59	Serbia & Montenegro	0.45	Yemen	0.18
Austria	0.75	Bahrain	0.58	Saudi Arabia	0.44	Togo	0.18
Germany	0.74	Chile	0.58	Peru	0.44	Solomon Islands	0.17
Australia	0.74	Antigua & Barbuda	0.57	China	0.43	Uganda	0.17
Belgium	0.74	Barbados	0.57	Fiji	0.43	Zambia	0.17
New Zealand	0.72	Malaysia	0.57	Botswana	0.43	Myanmar	0.17
Italy	0.72	Lithuania	0.56	Iran (I.R.)	0.43	Congo	0.17
France	0.72	Qatar	0.55	Ukraine	0.43	Cameroon	0.16
Slovenia	0.72	Brunei Darussalam	0.55	Guyana	0.43	Cambodia	0.16
Israel	0.70	Latvia	0.54	Philippines	0.43	Lao P.D.R.	0.15
		Uruguay	0.54	Oman	0.43	Ghana	0.15
		Seychelles	0.54	Maldives	0.43	Malawi	0.15
		Dominica	0.54	Libya	0.42	Tanzania	0.15
		Argentina	0.53	Dominican Rep.	0.42	Haiti	0.15
		Trinidad & Tobago	0.53	Tunisia	0.41	Nigeria	0.15
		Bulgaria	0.53	Ecuador	0.41	Djibouti	0.15
		Jamaica	0.53	Kazakhstan	0.41	Rwanda	0.15
		Costa Rica	0.52	Egypt	0.40	Madagascar	0.15
		St. Lucia	0.52	Cape Verde	0.39	Mauritania	0.14
		Kuwait	0.51	Albania	0.39	Senegal	0.14
		Grenada	0.51	Paraguay	0.39	Gambia	0.13
		Mauritius	0.50	Namibia	0.39	Bhutan	0.13
		Russia	0.50	Guatemala	0.38	Sudan	0.13
		Mexico	0.50	El Salvador	0.38	Comoros	0.13
		Brazil	0.50	Palestine	0.38	Côte d'Ivoire	0.13
				Sri Lanka	0.38	Eritrea	0.13
				Bolivia	0.38	D.R. Congo	0.12
				Cuba	0.38	Benin	0.12
				Samoa	0.37	Mozambique	0.12
				Algeria	0.37	Angola	0.11
				Turkmenistan	0.37	Burundi	0.10
				Georgia	0.37	Guinea	0.10
				Swaziland	0.37	Sierra Leone	0.10
				Moldova	0.37	Central African Rep.	0.10
				Mongolia	0.35	Ethiopia	0.10
				Indonesia	0.34	Guinea-Bissau	0.10
				Gabon	0.34	Chad	0.10
				Morocco	0.33	Mali	0.09
				India	0.32	Burkina Faso	0.08
				Kyrgyzstan	0.32	Niger	0.04
				Uzbekistan	0.31		
				Viet Nam	0.31		
				Armenia	0.30		

Note: On a scale of 0 to 1 where 1 = highest access. DAI values are shown to hundreds of a decimal point. Countries with the same DAI value are ranked by thousands of a decimal point.

Source: ITU.

Source:ITU

Map 1



Source: ITU

2.5 Telecommunications Infrastructure in Trinidad & Tobago

TSTT is currently the sole provider of fixed-line and mobile services in Trinidad and Tobago. It is also the sole provider of leased line facilities. As indicated at Table VI, the telecommunications industry in Trinidad and Tobago is similar to that in a number of Latin American and Caribbean countries where the mobile subscriber base (approximately 624,859) has surpassed the fixed-line subscriber base (318,879). Notwithstanding the level of mobile penetration rate (63%), the quantity of complaints by subscribers due to the quality of services of the incumbent bespeaks the need for

improvement which seems likely only in an interconnected and keenly competitive environment.

Table VI
Trinidad and Tobago Telecommunications Network and Network Charges

Telephone Network	2004	2005	Connection Charge and Monthly Subscription	2004 \$	2005 \$
Number of Main Lines	318,879	N/A	Residential Connection Charge	295	295
Number of Residential Lines	267,659	N/A	Commercial Connection Charge	365	365
Number of Commercial Lines	51,220	N/A			
Number of Pay Phones	2,700	N/A			
Tele-density	-				
Mobile Subscribers	477,805	624,859	Mobile Connection Charge		
Post-paid	85,490	88,399	Pre-paid GSM	-	-
Pre-paid	392,315	536,460	Post-paid GSM	150	150
Penetration Rate					
Leased Line Circuits	N/A	3609	Monthly subscription (commercial) – single line	177	177
			(commercial) – Trunk	265	265
Local Exchange Capacity	-	450,941	Monthly subscription (residential)	31	31
Number of Internet users	44,223		Monthly Internet Subscription Charge	Varies*	No change
			ADSL Monthly Charge	Varies**	
			Leased Line Monthly Charges		
			E1 Monthly charges		
			- Domestic	N/A	N/A
			T1 Monthly charges		
			- Inter-exchange	8382	8382
			- Intra-exchange	5868	5868

Source: TSTT

*Available at http://www.tsst.net.tt/personal/internet/du_rates.cfm

** Available at http://www.tsst.net.tt/personal/internet/hs_rates.cfm and at http://www.tsst.net.tt/business/internet/hs_rates.cfm

The total number of Internet users (including subscribers of TSTT and other ISPs) estimated at 138, 000 seems underestimated. But even if that figure is inflated by 10% (151 800), the number of Internet users in the country would still be unacceptably low, approximately 11% of the population. It is therefore evident that under the present monopoly arrangements, the level of national use of telecommunication technologies as a tool in daily activities is less than satisfactory in a country that is seeking to effect drastic transformation of its economic structure.

3 Policy Challenges

The dynamics of the international telecommunications market vis-à-vis our restrictive domestic telecommunications market present serious challenges or indeed, opportunities for Government's policy. The country must construct and apply appropriate measures to address the issues involved in facilitating and maintaining intra-network access that permits a level of service delivery which is conducive to comprehensive enhancement in human welfare. To this end, it is becoming for such policy measures to be informed by the successes of countries that are ahead of us, and there are many. Nevertheless, the goal is to craft measures that will enable the country to become a telecommunications leader and not simply a distant follower.

The Government is fully cognizant that a fundamental requisite for fair competition is an interconnection policy which provides for non-discriminatory and economic co-existence of multiple networks. Interconnection initiates the advent of multiple networks. The rapidity of liberalization of the telecommunications markets in Trinidad and Tobago is contingent on the pace at which telecommunications policies and regulations provide for the accommodation of multiple networks and service providers. In an effort to make good the opportunities identified in its National Information & Communication Technology Strategy to create a: "connected, committed, competitive, creative and caring community", a forward looking interconnection policy which treats fairly with convergent networks is imperative.

A system of multiple networks and service providers facilitates consumer choice, encourages investment, improves the quality of services delivered, and influences price reduction. Interconnection is, *de facto*, the engine of competition, since competition requires that each bona fide carrier be given the opportunity to access all customers, including those served on the network of competitors.

A necessary condition of a multiple network system is the ability of subscribers of different network and service providers to seamlessly communicate. This should not be an option - it is a fundamental obligation on all concessionaires.

Therefore, in seeking to move Trinidad and Tobago beyond a restrictive market, the Government will introduce extensive and fair competition in the delivery of international and domestic (fixed and mobile) telecommunications services with minimal network and service technology restrictions. To this end, the Government, by this policy, establishes guidelines for the preparation of interconnection regulations. These regulations are necessary to assist the Authority in its day-to-day management of the interconnection issues that attend competition among concessionaires that meet the criteria to interconnect.

4 Policy Objectives

In order to initiate and sustain the Government's thrust to liberalize the telecommunications market in Trinidad and Tobago this policy seeks to:

- provide the civil society and the business community in Trinidad and Tobago with a matrix of choices in telecommunications network and service providers by fully liberalizing the telecommunications market in the country.
- increase the range, scope and quality of telecommunications services available to the public.
- structure the liberalization process in a manner that will realize competitive prices for end users.
- create an environment which encourages investment in the telecommunications sector as a means of improving the quality and expanding the range of services delivered to the most challenged communities in the country.
- honour the country's commitment as a signatory to the World Trade Organization (WTO) under the General Agreement of Trade in Services (GATS) for the telecommunications sector.

As part of the modalities to realize those objectives, this policy provides and establishes a set of directives designed to facilitate and maintain access to public telecommunications networks in the Republic of Trinidad and Tobago. In particular, this policy is tailored to encourage investment in new telecommunications technologies to satisfy the demands of convergence. In general, the policy forms the foundation for the construct of regulations which will provide legal certainty for:

- o Any-to-any interconnectivity among users attached to competing networks;

- o Interoperability between competing networks using national and international standards that are mandated for interconnection and complying with the conventions of the national numbering plan;
- o Telecommunications providers to plan, construct, dimension and operate their networks in a manner that is robust enough to enable the networks to remain operational at all times including, times of traffic volatility and natural disasters which are not exceptional;
- o The protection of subscriber data in order to preserve privacy and confidentiality;
- o Minimum quality standards which ensure end-user access to reasonable quality of services
- o Prices that are affordable to a wide cross-section of the population, including the physically and economically challenged; and
- o Encouragement of investment in new generation technologies that can serve as a catalyst for advancement of the civil society, particularly in economically and geographically disadvantaged communities.

5 Interconnection Services and Interconnection Resources

5.1 Interconnection Services

Interconnection services may be grouped as follows:

- A. Basic data or voice traffic;
- B. Support Services;
- C. Enhanced Services.

Basic interconnection services involve the following services for both voice and data traffic:

- **Traffic origination:** traffic sent by a concessionaire from a subscriber on its network to the point of interconnection for transport on the network of another concessionaire;
- **Traffic termination:** a concessionaire delivering to its subscribers traffic delivered to a point of interconnection on its network by another concessionaire;
- **Transit traffic:** a concessionaire delivering traffic from one (originating) concessionaire to another (terminating) concessionaire via a third concessionaire.

Interconnection support services are customer related and include, but are not limited to:

- Directory enquiry
- Emergency numbers
- Operator assistance

Enhanced services include:

- Equal access pre-selection i.e. where the choice of international carrier is made available to subscribers, independent of network subscription;
- Number portability, i.e. enabling subscribers on similar networks the choice of changing service provider without changing telephone number.

5.2 Interconnection Resources

Interconnection resources are network components that are required for the provision of an interconnection service. Network components include, but are not limited to: facilities such as buildings, ducts, masts, and transmission facilities; but they may also include other components such as switching /routing, transmission and control equipment and functions, software systems (e.g. operational support systems, number translation systems) and databases.

Policy Statement 1

Concessionaires that meet the eligibility criteria prescribed by the Authority shall be obliged to interconnect to facilitate the delivery of quality service/s to a wide cross section of end-users at affordable prices and such services shall be detailed in the Interconnection Regulations and may be revised from time to time by the Authority.

Policy Statement 2

The eligibility of any concessionaire to participate in interconnect arrangements is dependent on its capability to meet the basic obligation of reciprocity i.e. if seeking to obtain access to another concessionaire's interconnection services it must provide access in return to its own interconnection services.

6 WTO Interconnection Policy

The Trinidad and Tobago Government is a signatory to the Reference Paper appended to the WTO Fourth Protocol of the General Agreement on Trade in Services. This policy observes the requisite interconnection measures in that Reference Paper as indicated hereunder.

“Interconnection with a major supplier will be ensured at any technically feasible point on the network. Such interconnection is provided:

- Under non-discriminatory terms, conditions (including technical standards and specifications) and rates of a quality no less favourable than that provided for its own like services or for like services of non-affiliated services suppliers or for its subsidiaries or other affiliates;*
- In a timely fashion, on terms, conditions (including technical standards and specifications) and at cost oriented rates, that are transparent, reasonable, having regard for economic feasibility and sufficiently unbundled so that the supplier need not pay for network components or facilities that it does not require for the service to be provided;*
- Upon request, at points in addition to the network terminating points offered to the majority of users, subject to charges that reflect the cost of construction of the necessary additional facilities.”*

“The procedures applicable for interconnection to a major supplier will be made publicly available.”

“It is ensured that a major supplier will make publicly available either its interconnection agreement or a reference interconnection offer.”

“A service supplier requesting interconnection with a major supplier will have recourse, either:

a) at any time, or

b) after a reasonable period of time which has been made publicly known

to an independent domestic body which may be a regulatory body, to resolve disputes regarding appropriate terms, conditions and rates for interconnection within reasonable period of time, to the extent that these have not been established previously.”

Policy Statement 3

Any concessionaire designated by the Authority as a dominant concessionaire must provide interconnection on request at any technically feasible network point on a cost-orientated and non-discriminatory basis. Any interconnection arrangement of a dominant concessionaire must be made available to the Authority and to the public.

Policy Statement 4

Any interconnection matter referred to the Authority as a dispute shall be resolved in the manner specified in Enforcement and Compliance Regulations issued by the Authority.

Policy Statement 5

Requirements for access to the facilities of a dominant concessionaire, including unbundling and collocation, will be specified in Access to Facilities Regulations issued by the Authority.

7 Quality of Service

The technical standards of public telecommunications networks of competing service providers shall be at a level where interface does not compromise the integrity of the overall national network. Absolute interconnection quality standards shall be based on international benchmarks while relative standards shall be measured in terms of the comparative quality of services provided to affiliates and interconnecting competitors.

The government is aware of the dynamic changes in telecommunications networks. The advent of packet switching has altered the boundary between voice, data and image traffic. In such circumstances the Authority shall put in place measures to encourage all interconnecting networks to achieve reasonable quality levels whilst remaining technology-neutral.

Policy Statement 6

The Authority shall prescribe both the interconnection quality of service standards. These will be published in Quality of Service Regulations and appropriate penalties for non-compliance will be specified in Enforcement and Compliance Regulations.

8 Equal Access & Carrier Pre-selection

In the early days of market liberalization, subscribers were obliged to dial considerably more digits to route calls to new entrants' networks since incumbent operators' switches were not designed for inter-working among domestic networks. With the advent of appropriate software packages, switches/routers are now far more adaptable to multi-operator systems and are capable of facilitating dialing parity with minimum difficulty. Consequently, telecommunications end-users are now able to access the service of new service providers with the same ease as they access the services of an incumbent. This should be the case in Trinidad and Tobago.

To enable equal access may require the following features and services to be made available:

- Trunk-side interconnection to switches;
- Software features to identify customer selection as well as route and bill traffic to the selected service provider;
- Basic signaling services, including Calling Line Identification (CLI) answer and disconnect supervision;
- Billing and audit arrangements capable of permitting direct billing and a hybrid of direct and indirect billing by concessionaires;

It is also important that the Numbering Plan for the country as developed and managed by the Authority enables the allocation of equivalent numbers to new entrants and the

incumbent (TSTT) in a non-discriminatory and equitable manner (similar access codes for all international service providers and equivalent blocks of numbers for mobile and domestic fixed-line providers).

Policy Statement 7

All concessionaires will be required to configure their networks to enable customers to pre-select the international service provider of their choice.

9 Non-Discrimination

Avoidance of discrimination is central to this Policy. The Government is aware that interconnection arrangements among competitors may vary from time to time, contingent on certain circumstances without being unduly or unjustly discriminatory. As an example, two competitors may request different interconnection arrangements to suit their different operating conditions.

The most difficult forms of discrimination to identify and manage are interconnection arrangements between parent firms and their affiliates. Occurrences of discriminatory practices where incumbents or dominant service providers supply insufficient network capacity to competing interconnecting operators while providing adequate capacity for their affiliates are well documented.

Whatever the circumstance, the standard for unjust, undue or unfair discrimination is that an interconnecting competitor should not be disadvantaged as a result of different or less favourable interconnection arrangements. In order to dissuade discriminatory practices, concessionaires will be required to construct sufficient network capacity to cater for its share of exchange of traffic.

Where feasible, concessionaires shall provide interconnection and access to facilities on their networks for interconnecting concessionaires in a manner similar to that obtained by a subsidiary. The Regulations shall mandate inclusion of specified standards of performance for the installation, maintenance, testing and repair of resources used to provide interconnection.

Experiences drawn from a number of countries suggest that a requisite for the implementation of non-discriminatory policy measures is technology neutrality and, most recently, service neutrality. Technology neutral policy prescriptions help to guarantee non-preferential treatment of all technologies that have satisfied specified standards. Where technology discrimination is allowed, markets tend to be ineffective in

determining the most efficient mode of service delivery. This is a form of misallocation of resources. Mindful of the need to level the playing field for service providers, while availing choice to affordable-high-quality telecommunication services, a system of technology neutrality should apply.

Interoperability requires networks to be technically compatible. A concessionaire who is eligible to interconnect shall be allowed access to the technical specifications of the network of the concessionaire from which interconnection is sought. Such information shall include, at a minimum, types of switching, routing and transmission equipment used, signaling protocols, number of circuits and projected volume of traffic.

Policy Statement 8

There shall be no discrimination among concessionaires in the terms of supply or the prices of interconnection services or access to facilities.

Policy Statement 9

A dominant concessionaire shall specify in its Reference Interconnection Offer standards of performance for the installation, maintenance, testing and repair of interconnection services, and these standards shall be no lower than those applied for equivalent services or resources supplied to itself, its subsidiaries or its partners.

Policy Statement 10

The Authority shall ensure that no operator selectively or otherwise withholds information which is necessary for efficient and timely interconnection implementation.

10 Transparency

Transparency is about open access to, and disclosure of, information on the regulation and operation of the telecommunication industry in a country. Ready disclosure of non-confidential information concerning operational procedures in the industry encourages confidence, particularly among new and prospective market entrants, that common treatment applies to all investors. Moreover, disclosure concerning interconnection agreements contributes significantly to reduction of disputes regarding discriminatory practices. In effect, non-discriminatory requirements are very difficult to attain without transparency.

In competitive markets regulators are seldom, if at all, directly involved in negotiations of interconnection agreements between parties. This notwithstanding, it is obligatory that regulators review and endorse all interconnection agreements to determine whether they are consistent with policies of their respective governments.

Policy Statement 11

A dominant concessionaire must submit its Reference Interconnection Offer to the Authority for review and authorization prior to coming into force. All other concessionaires must lodge their interconnection agreements with the Authority within 28 days of coming into force.

11 Pricing Interconnect Services

Interconnection charges contribute significantly to the total operational costs of new telecommunications service providers, in particular new entrants that do not own end-to-end networks. In order to encourage competition, it is essential that interconnection rates in the country be based on costs that are reflective of efficiency so as to minimize over-charging for services, either by excessive mark-ups or transfer of network inefficiencies.

An equitable and commercially fair pricing mechanism for interconnection is required. The criteria for equity and commercial justice should be determined by the relationship between interconnection rates and actual efficient costs of interconnection services. Whenever interconnection rates are set above efficient costs, the supplier has an injudicious advantage over competitors. When the rates are set below cost, there is minimal incentive, if any, for investment in new network rollout or expansion.

In order to encourage parity between prices and costs, the Authority should mandate that the interconnection charges of any interconnection provider should reflect the efficient costs of supply. Cost-efficient pricing is a calculus of basic efficient cost and reasonable return on capital. Though proven to be an effective and efficient pricing methodology, cost-efficient pricing methodologies have been most problematic to implement.

The fundamental difficulty in applying cost-efficient pricing to interconnection resources is arriving at an effective quantitative methodology (cost model) for estimating efficiency. A standard cost model approved by the Authority for use by all concessionaires can help to achieve this. Standard cost models go a long way in meeting the principles of equity, transparency and non-discrimination. It also reduces avenues for dispute consequent upon disagreement on cost-derivation methodologies.

An appropriate cost model should have the capacity to:

- Account for initial costs for network adjustment to facilitate interconnection by a one-off charge;
- Convert recurrent non-traffic-sensitive costs such as interconnection links, collocation etc, into monthly flat rate charges; and
- Cover traffic throughput cost either by a flat rate charge for capacity or a charge per minute.

The methodology/formula for estimating the cost of interconnection resources, as prescribed by the Authority, may take into consideration the costing specifications agreed to at the ITU for the TAL region (Latin American and Caribbean countries).

Policy Statement 12

The Authority may establish costing models, methodologies or formulae to be used to establish the charges for a dominant concessionaire's interconnection services, and/or to resolve interconnection disputes between concessionaires.

12 Asymmetric Interconnection Charges

Observation holds that the principle of a common price for call termination in both directions is applicable only to fixed networks, at least in the initial period of competition. There is evidence that the cost of call termination on mobile networks is generally higher than on fixed networks. It is also an accepted principle that mobile calls generate additional traffic on fixed networks. In the circumstances, most interconnection pricing models have allowed asymmetrical termination charges for fixed-line and mobile networks.

12.1 The situation in developed countries

Initially, most mobile networks were subsidiaries of fixed line operators which, invariably held positions of market dominance in the provision of voice telephony. Within these intra-company arrangements, interconnection charges for exchanging traffic between the fixed and mobile networks were not properly defined. In many instances there were no charges to terminate traffic on the different networks.

Mobile operators that were not subsidiaries of fixed-network service providers were allowed to charge considerable higher interconnection fees for terminating traffic on their network than they paid to send their traffic on fixed networks. This approach was widespread among the more developed countries in Europe and Asia-Oceania, in particular Europe, (Tables VII & VIII). Among the more developed countries of Asia-Oceania, the percentage difference ranged between 794.1% (Australia) and 220.9% (South Korea).

Regulators in developed countries opined that favorable price differential was accorded to mobile service providers as an incentive for the development of mobile networks. It should be noted that these countries already had large fixed networks and relatively high fixed-line teledensities (Map 2).

Table VII

Interconnection charges (2003) Developed European Countries				
US\$/minute	Mobile	Fixed	Difference (nominal)	Difference (percentage)
Netherlands	0.159	0.0104	0.1486	1428.8
Sweden	0.13	0.009	0.121	1344.4
Belgium	0.148	0.012	0.136	1133.3
Norway	0.1292	0.0115	0.1177	1023.5
Spain	0.146	0.0135	0.1325	981.5
Italy	0.139	0.0132	0.1258	953
Germany	0.128	0.0125	0.1155	924
France	0.138	0.014	0.124	885.7
Ireland	0.1338	0.014	0.1198	855.7
Switzerland	0.1635	0.0173	0.1462	845.1
United Kingdom	0.1175	0.0125	0.105	840
Denmark	0.124	0.0136	0.1104	811.8
Austria	0.123	0.0143	0.1087	760.1
Portugal	0.162	0.0207	0.1413	682
Finland	0.124	0.02	0.104	520
Luxemburg	0.0953	0.0169	0.0784	463.9
Greece	0.1039	0.0324	0.0725	230.9
Monaco	0.095	0.44	0.0505	114.8
Average	0.1311	0.0388	0.1143	822.1389

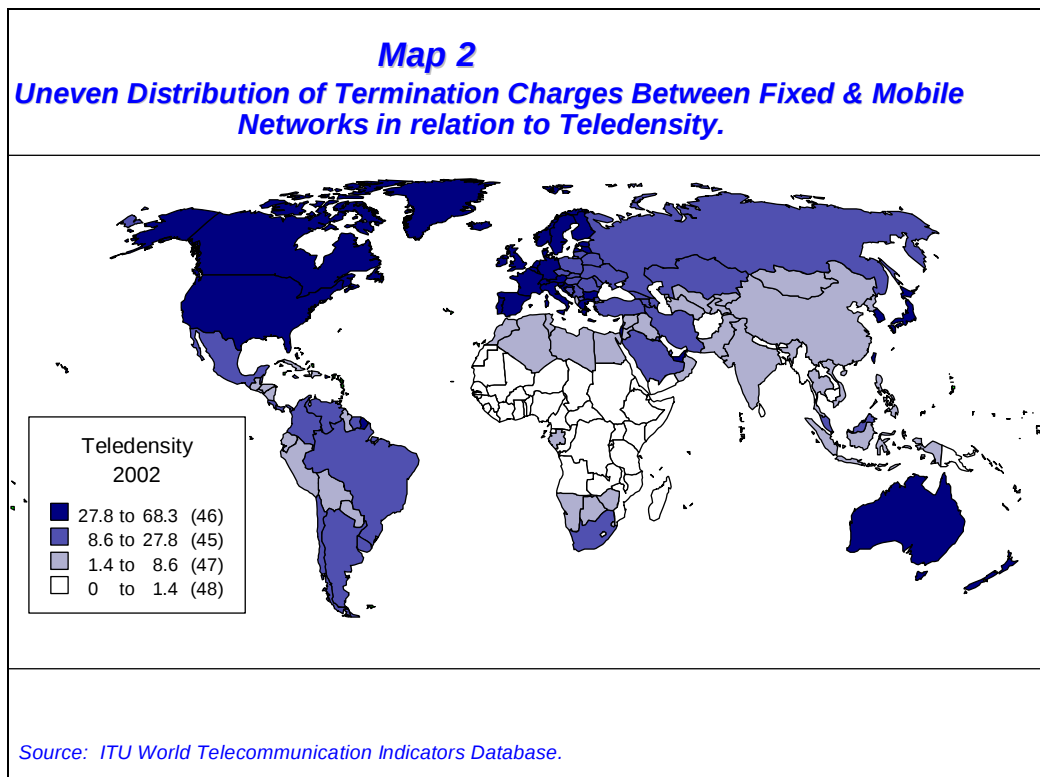
Source: INTUG (Submission to ITU-T)

Table VIII

Interconnection Charges (2003) Developed Asia-Oceania Countries				
US\$/minute	Mobile	Fixed	Difference (nominal)	Difference (percentage)
Australia	0.152	0.017	0.135	794.1
New Zealand	0.123	0.0188	0.142	554.3
Japan	0.13	0.0228	0.1072	470.2
Korea (South)	0.069	0.0215	0.0475	220.9
Average	0.1185	0.0200	0.1079	509.875

Source: INTUG (Submission to ITU-T)

This practice is now being challenged in most developed countries and is currently under active examination at Study Group 3, ITU.



12.2 Asymmetric Interconnection Charges, Emerging Economies

Except for a few countries, the difference in termination charges on mobile and fixed networks is significantly less in emerging economies in Europe and Asia-Oceania (Tables IX & X).

Table IX

Interconnection Charges (2003)				
Emerging European Countries				
US\$/minute	Mobile	Fixed	Difference (nominal)	Difference (percentage)
Poland	0.14	0.0395	0.1075	272
Czech Republic	0.117	0.039	0.0831	245.1
Iceland	0.0755	0.035	0.0405	115.7
Hungary	0.135	0.041	0.094	229.3
Cyprus	0.14	0.065	0.075	115.4
Slovakia	0.1115	0.0564	0.0551	97.7

Bulgaria	0.115	0.06	0.055	91.7
Slovenia	0.135	0.071	0.064	90.1
Latvia	0.1485	0.0965	0.052	53.9
Yugoslavia	0.133	0.0963	0.0367	38.1
Albania	0.1025	0.095	0.0075	7.9
Faroe Islands	0.083	0.077	0.006	7.8
Romania	0.116	0.1079	0.008	7.4
Liechtenstein	0.32	0.03	0.002	6.7
Belarus	0.16	0.16	0	0
Ukraine	0.0749	0.0825	-0.0076	-9.2
Russia	0.0515	0.055	-0.0035	-6.4
Greenland	0.229	0.253	-0.024	-9.5
Average	0.1326	0.0811	0.0362	75.2056

Source: INTUG (Submission to ITU-T)

Table X

Interconnection Charges (April 2003) Emerging Economies (Asia-Oceania)				
US\$/minute	Mobile	Fixed	Difference (nominal)	Difference (percentage)
Thailand	0.1010	0.0850	0.0160	18.8000
Malaysia	0.2950	0.0250	0.0045	18.0000
China	0.2500	0.2400	0.0010	4.2000
Singapore	0.0145	0.0140	0.0005	3.6000
Hong Kong SAR	0.0160	0.0160	0.0000	0.0000
Average	0.135	0.076	0.0044	8.92

Source: INTUG (Submission to ITU-T)

12.3 Asymmetric Interconnection Charges, Latin America & Caribbean & African Countries

The situation in Latin American and Caribbean and African countries (Table XI) is similar to that in Emerging Economies in Europe and Asia-Oceania. The average difference is 43%.

Table XI
Interconnection Charges (April 2003)
Latin America & Caribbean Countries

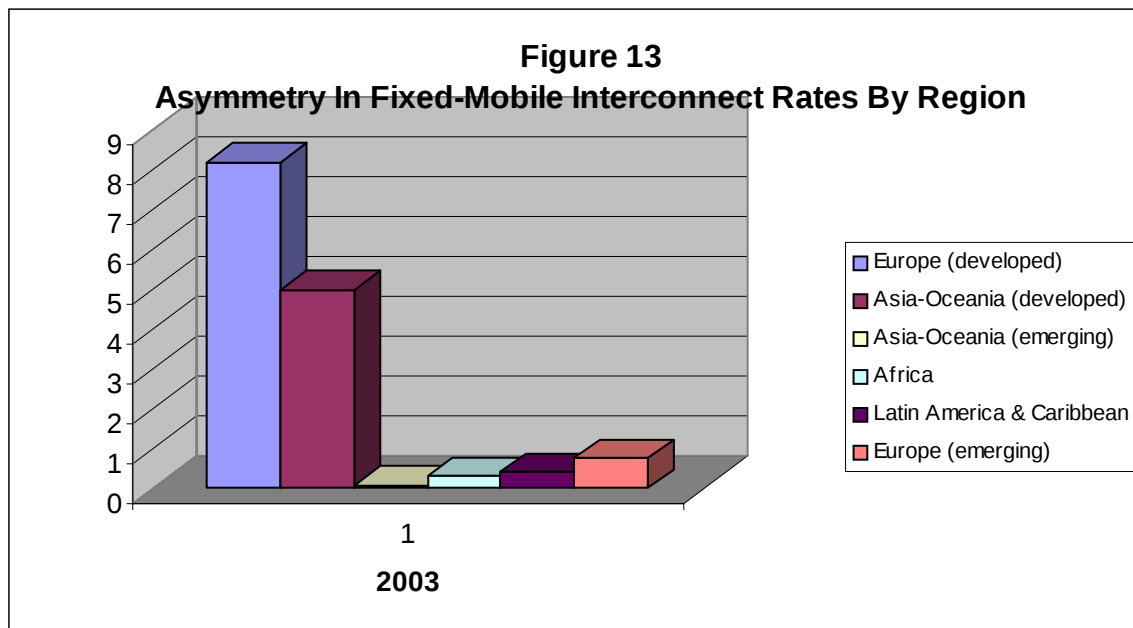
Country /US\$ per minute	Mobile	Fixed	Nominal Difference	Percentage Difference
Chile	0.1200	0.0229	0.0971	424%
Peru	0.1800	0.0945	0.0855	90%
Venezuela	0.1855	0.1150	0.0705	61%
Haiti	0.2425	0.1555	0.0870	56%
Paraguay	0.1920	0.1400	0.0520	37%
Brazil	0.0850	0.0624	0.0226	36%
Jamaica	0.1525	0.1321	0.0204	15%
Ecuador	0.1200	0.1050	0.0150	14%
Barbados	0.1490	0.1340	0.0150	11%
Trinidad & Tobago	0.1150	0.1040	0.0110	11%
Bolivia	0.1849	0.1680	0.1690	10%
Cuba	0.5440	0.5295	0.0145	3%
Anguilla	0.1796	0.1750	0.0046	3%
Colombia	0.0743	0.0740	0.0003	0%
St. Vincent	0.1910	0.1910	0.0000	0%
Guatemala	0.0470	0.0470	0.0000	0%
Costa Rica	0.0170	0.0170	0.0000	0%
Uruguay	0.1630	0.1650	-0.0020	-1%
Average	0.1635	0.1351	0.0284	43%

Source: INTUG (Submission to ITU-T)

Table XII
Interconnection Charges (2003)
African Countries

Country/US\$ (per minute)	Mobile	Fixed	Difference Nominal	Difference Percentage
South Africa	0.1385	0.0620	0.0765	123%
Zimbabwe	0.0545	0.0470	0.0075	16%
Morocco	0.1900	0.1820	0.0080	4%
Zambia	0.0950	0.0950	0.0000	0%
Madagascar	0.1400	0.1425	0.0025	12%
Average	0.1236	0.1057	0.0189	31%

Source: INTUG (Submission to ITU-T)

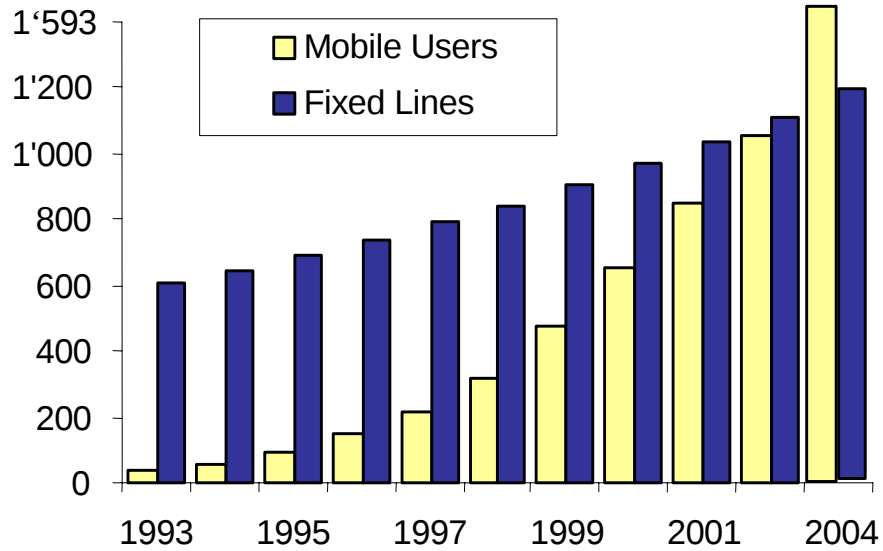


12.4 International Network Expansion & Pricing

The contention of favourable pricing to encourage growth in mobile networks has run its course. It is no longer applicable since the number of global mobile subscribers has now overtaken the number of global fixed-line subscribers (Figure 14).

Figure 14
A Mobile Revolution

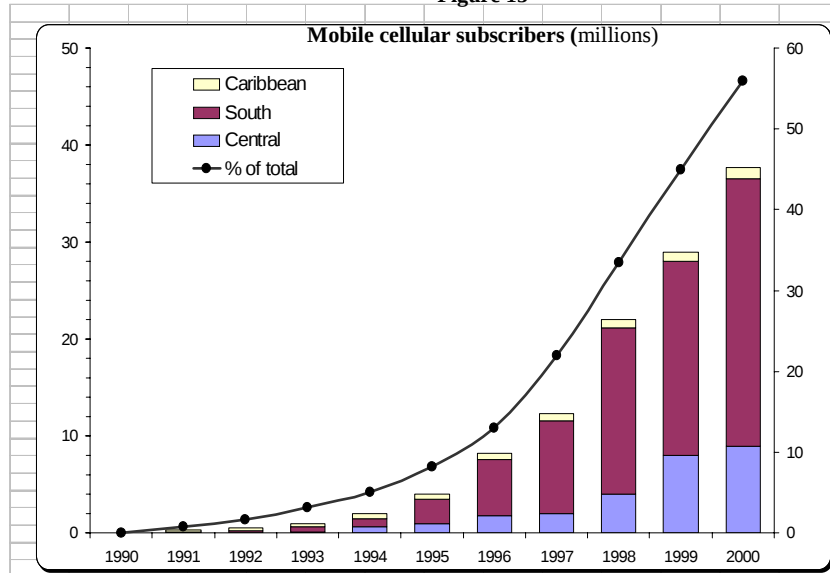
Fixed Lines vs. Mobile Users, worldwide, Million



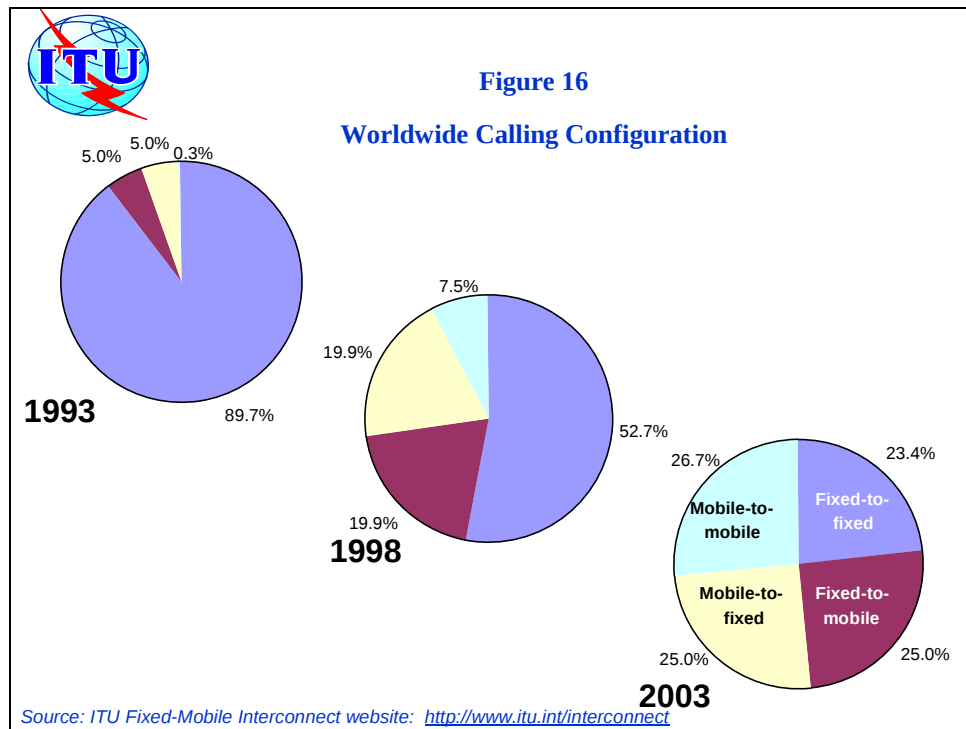
Source: ITU World Telecommunication Indicators Database.

This situation is most acute in the Latin American and Caribbean region where the fixed-line subscriber base (including ISDN lines) has been growing marginally against an exponential growth rate in the mobile subscriber base (Figure 15).

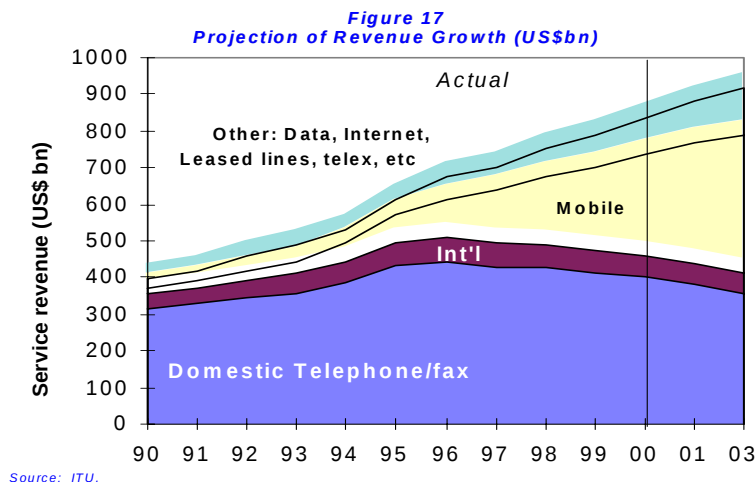
Figure 15



Source: ITU



Due to reduction in international settlement rates and a shift in calling pattern toward inclusion of mobile phones (Figure 16), growth in revenue from fixed-line operations (both domestic and international) has been on a declining path while revenue from mobile operations has been experiencing a significant positive growth trend (Figure 17).



12.5 Observation

(1). Growth rates in mobile network subscribers and mobile revenue have been much higher than comparative rates for fixed-line networks, to the extent that globally, there are currently more mobile subscribers than fixed line subscribers.

(2). The reasoning for usage of price subsidies to encourage expansion of mobile networks in developed or developing countries is no longer valid since per average, the mobile subscriber base is now broader than the fixed-line subscriber base.

(3). The mobile sector in the Caribbean is mature enough to withstand cost oriented interconnection pricing.

Policy statement 13

Asymmetries between fixed and mobile interconnection charges should reflect differences in the efficient costs of supply. Where measures are not in place for determination of efficient costs on mobile and fixed networks, the Authority shall carefully benchmark similar charges in other similar markets.

13 Peak & Off-peak Charges

These charges are common features in retail pricing for telecommunications services.

Peak and off-peak charges:

- encourage more efficient usage of network capacity by reducing peak hour congestion;
- reduce the need for network reconfiguration to meet additional peak load traffic; and
- improve the quality of service.

Policy statement 14

Separate peak and off-peak interconnection charges will be allowed as they are consistent with efficient cost-based pricing and enable interconnecting concessionaires to set differentiated peak and off-peak retail prices.

14 Start-up Interconnection Costs

Transition from monopoly to a competitive environment usually involves start-up costs that are incurred at the onset to modify an interconnect provider concessionaire's switching and transmission facilities and associated software to commence interconnection. For example, switches have to be programmed to recognize and route traffic to new numbers on different networks.

Some regulators require start-up costs to be underwritten exclusively by the new entrants on the basis that it is the new entrants that are seeking interconnection. On the other divide, regulators have instituted a regime of shared start-up costs among the incumbent and parties requesting interconnection on the pretext that interconnection usually benefit all the parties.

Interconnect links are one example of start-up costs. Interconnection links are physical links that connect the networks of concessionaires. They are necessary to create a competitive market to the ultimate benefit of the country. Interconnection links may be comprised of the following components:

- transmission lines or radio links that carry interconnecting circuits;
- ducts, towers, manholes and other support infrastructure; and
- modifications to cross-connect and distribution frames to facilitate interconnected circuits.

The Trinidad and Tobago Government intends to encourage a highly competitive telecommunications environment in which no advantage will be willfully accorded to any service provider.

Telecommunication infrastructure build-out is usually expansive. As indicated above, supporting infrastructure may include poles, ducts, conduits, towers, street pedestals, trenches and manholes. Construction of each of these facilities poses varying degrees of environmental stress. In order to protect the environment and optimize the economic use of network facilities, the Authority shall work in conjunction with the relevant Town and Country agency to ensure that there is no unnecessary proliferation of cell towers throughout the country.

Policy statement 15

The Authority will encourage infrastructure sharing wherever possible, and will prescribe a system of shared start-up costs among interconnecting concessionaires based on estimates of efficient cost.

15 Access Deficit

One of the most taxing challenges of costing and pricing interconnection services is determining the access deficit allocation/contribution. Most of the literature on access deficit assumes that prior to competition, fixed networks in developing countries subsidized service delivery on the local loop from above-cost settlement rates. Consequent upon steep reduction in settlement receipts, a number of providers have been campaigning for re-balancing domestic rates in congruence with cost. While there may be some merit in this contention, a number of issues that attend cost-based re-balancing must be addressed in order to determine the extent of price adjustment needed, or whether price adjustment is indeed necessary.

The issue of the regulator prescribing the methodology for estimating costs on the local loop is paramount. Where providers are allowed to use individual cost methodology, the likelihood of overstating costs is considerably high. This would most certainly distort pricing of interconnection resources. There is a strong body of opinion that because of the monopoly situation, there has been little incentive to enhance efficiency through application of state-of-the-art technology within the local loop. As a consequence, there is a high probability of a causal relationship between access deficit on the local loop and technology obsolescence. In this regard, the pertinent question to be addressed is: what is the cost of inefficiency due to capital goods being kept in use on the local loop beyond their shelf lives? In order to cogently address these issues, estimates of access deficit will be based on a transparent cost methodology approved by the Authority.

Policy statement 16

Where the Authority is satisfied that access deficit exists, it may authorize rate rebalancing. No access deficit contributions will be allowed in interconnection charges.

Annex I Definition of Terms

“Access agreement” means a document detailing arrangements as negotiated and agreed between parties for an access seeker to obtain access to facilities within an access provider's network in accordance with section 26(2) of the Act, and which is binding on the signatory parties over the period of the agreement.

“Access charge” means any charge for access to a facility on a public telecommunications network.

“Access provider” means the concessionaire which is providing access to its facilities to an access seeker.

“Access seeker” means the concessionaire which is seeking access to the facilities of another concessionaire.

“Calling line identity (CLI)” means the information generated by a telecommunications network which identifies the number of the calling party.

“Carrier pre-selection” means a form of equal access in which the customer selects a preferred service provider.

“Collocation” means provision of space at the premises of an access provider for purposes of an access seeker to install its network equipment.

“Concessionaire” means a person or an entity authorized to operate a public telecommunications network or provide a telecommunications service or broadcasting service under section 21 of the Act.

“Dominant concessionaire” means any concessionaire/service provider so deemed under section 29(8) of the Act.

“Efficient costs” means [to be completed by TATT]

“Equal access” means a facility enabling a customer to choose in a transparent and equal manner between two or more competing service providers.

“Essential facility” means a facility in the access provider's network which an access seeker requires in order to provide its service and for which no practical or viable alternative exists.

“Essential interconnection resource” means an interconnection resource for which no practical and viable alternative exists.

“Interconnect agreement” means a document detailing arrangements as negotiated and agreed between parties to interconnect their networks in order to provide telecommunication services in accordance with section 25(2)(e) of the Act, and which is binding on the signatory parties over the period of the agreement.

“Interconnecting concessionaire” means the concessionaire which is seeking interconnection services from another concessionaire.

“Interconnection provider” means the concessionaire which is providing interconnect services to an interconnecting concessionaire.

“Interconnection resource” means a component of a network or a combination of such components that is required for the provision of an interconnection service.

“Interconnection service” means a service provided by an interconnection provider to an interconnecting concessionaire.

“Interconnect link” means a transmission path connecting the point of interconnection with the network of an interconnecting concessionaire.

“Local loop” means the network linking termination point at the end user premises to the main distribution frame or equivalent facility in a fixed public telephone network.

“Number portability” means a facility enabling a customer to retain the same telephone number when changing telephone service provider.

“Point of interconnection” means a point on the interconnection provider's network where physical connection is allowed to any interconnecting concessionaire to act as a gateway between networks and enable the exchange of telecommunications services between or among networks so interconnected.

“Reference Interconnect Offer (RIO)” means a document setting out the terms on which interconnection provider proposes to offer interconnect services to interconnecting concessionaires.

“Traffic origination” means an interconnection service providing connectivity from a network termination point on a customer's premises to the point of interconnection.

"Traffic termination" means an interconnection service providing connectivity from a point of interconnection to a network termination point on a customer's premises.

"Transit services" means interconnection services that deliver traffic from one interconnecting concessionaire (the origination provider) to another interconnecting concessionaire (the termination provider).