Policy for Micro, Small and Medium-Sized International Public Telecommunications Service and/or Network Providers in Trinidad and Tobago

(DRAFT)

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1. Executive Summary

1.1 This policy develops the necessary framework for the regulation of micro, small and medium-sized International Public Telecommunications Services and/or Networks in Trinidad and Tobago. The policy will ensure that the Telecommunications Authority of Trinidad and Tobago (TATT) will be fair, transparent and non-discriminatory in the regulation of these micro, small and medium-sized International Public Telecommunications Service and/or Network Providers (IPTSNP) operating in the Republic of Trinidad and Tobago.

1.2 This policy is designed and targeted specifically to the micro, small and medium-sized enterprises that offer international public telecommunications services and/or networks and not the larger Service and/or Network Providers such as the incumbent provider (Telecommunications Services of Trinidad and Tobago - TSTT) and other similar corporations.

1.3 This policy address general principles and concepts in order to develop a regulatory framework by which the necessary policy objectives may be achieved.

2. Definitions

2.0 'Telecommunications' includes the transmission or reception of signals, writing, emission or reception of signals writing ,pulses ,images ,sounds or other intelligence of any kind by wire wireless, optical or electromagnetic spectrum or by way of any other technology.[1]

2.1 'Telecommunications network' means a system or any part thereof used for the provision of a telecommunications service.[1]

2.2 'Telecommunications service' means a service using telecommunications whereby one user can communicate with any other user in real time, regardless of the technology used to provide such a service and includes a public telecommunications service, a private telecommunications service, a closed user group service and a radio communication service.[1]

2.3 'Public telecommunications network' means a telecommunications network used to provide a public telecommunications service.[1]

[1] Telecommunications Act 2001

2.4 A public telecommunications network provider means the provider of access to a telecommunications network for members of the general public. A public telecommunications network that is used by a public telecommunications service provider to enable the service provider's product is a carrier of public telecommunications.

2.5 'Public telecommunications service' means a telecommunications service, including a public telephone service ,offered to members of the general public, whereby one user can communicate with any other user in real time, regardless of the technology used to provide such services. [1]

2.6 A public telecommunications service provider means a provider that enables the delivery of telecommunications to members of the public. A public telecommunications service provider may own its public telecommunications network, or may connect to another party's public telecommunications network to offer its services or resell another network or service providers' services.

2.7 An International Public Telecommunications Service and / or Network Provider (IPTSNP) means a provider that provides or enables the provision of international or cross border public telecommunications to members of the public. An International Public Telecommunications Service and / or Network Provider may own its public telecommunications network, or may connect to another party's public telecommunications network to offer its services or resell another network or service providers' services.

2.8 Codec which is abbreviated for coder /decoder means an integrated circuit or other electronic device combining the circuits needed to convert digital signals to and from analog form.

2.9 'IP Telephony' means the reception and transmission of voice carried over the Internet Protocol (IP).

2.10 A 'Micro-Sized Enterprise' in Trinidad and Tobago may be defined as a business where the value of the company's assets must be in the range TT$1.00 to TT$100,000.00 in value, where the company is Owner Managed, employs one(1) to five(5) persons and where annual sales maximize at TT$99,000.00.[2]

2.11 A 'Small-Sized Enterprise' in Trinidad and Tobago may be defined as a business where the value of the company's assets must be in the range TT$101,000.00 to TT$300,000.00 in value, where the company must employ at least five (5) but not more than (25) twenty-five persons and where the company's annual sales range from TT$100,000.00 to TT$750,000.00.[2]

[2] Agricultural Development Bank

2.12 A 'Medium-Sized Enterprise' in Trinidad and Tobago may be defined as a business where the value of the company's assets must be in the range TT$ 301,000.00 to TT$1.5 million, where the company must employ at least twenty-six (26) but not more than fifty (50) persons and where the company's annual sales range from TT$750,000.00 to TT$6 million.[2]

3. Policy Objectives

3.1 Develop a framework which complements the Government of the Republic of Trinidad and Tobago's (GoRTT's) National Information and Communication Technology (NICT) Vision which states that:

"Trinidad and Tobago is in a prominent position in the global information society through real and lasting improvements in social, economic and cultural development caused by deployment and usage of information and communication technology."

3.2 Encourage the provision of universal and affordable access to ICT services, foster the development of a knowledge-based society thereby encouraging innovation and maximizing the potential of the nation's human resource.

3.3 Encourage and facilitate competition throughout the telecommunications sector, where feasible, and act in a fair, non-discriminatory, responsible and transparent manner when dealing with any matter concerning International Public Telecommunications Service and/or Network Providers.

3.4 Adopt an approach of technological neutrality in the regulation of international public telecommunications services and/or networks in accordance with the definition of "telecommunications" as stated in the Telecommunications Act 2001.

4. Background

4.1 Prior to 1970, Cable and Wireless (West Indies) Limited served the international telecommunications needs of Trinidad and Tobago, and the local Telephone Company (TELCO) which had the exclusive right to provide domestic telephone services nationally. In 1970, Trinidad and Tobago External Telecommunications Company (TEXTEL) was incorporated and granted a licence by the Government of Trinidad and Tobago to provide international telecommunications services. Though the licence did not give exclusive right to TEXTEL, no other party has been subsequently granted a licence to provide international telecommunications services to the public. Under the terms and conditions of its licence, TEXTEL was required to pay 3% of its annual gross revenue to the State as its licence fee.

4.2 In 1989, TEXTEL was merged with TELCO to form one company known as Telecommunications Services of Trinidad and Tobago (TSTT). A new licence was issued to TSTT to provide international telecommunications services to members of the general public, with the terms, conditions and rights under the previous licence maintained. In 1989 the Shareholders Agreement between the Government of Trinidad and Tobago, Cable and Wireless (West Indies) Limited, Cable and Wireless PLC and the Trinidad and Tobago Telephone Company Limited was signed authorizing the Trinidad and Tobago Telephone Company Limited to maintain and operate an external telecommunications network for a period of twenty years from the 13th of July 1989. Currently, TSTT pays a licence fee of 3% of its gross annual revenue.

4.3 TSTT was then mandated to provide public domestic and international telecommunications services and the continued expansion of its network to areas without telecommunications facilities, whether profitable or not. The latter requirement was known as its universal service obligation. In order to meet these commitments, TSTT was required to use, in part, its revenues earned from its international telecommunications services to fund its universal service development.

4.4 With the advent of the Internet, a number of Internet Service Providers (ISPs) have begun operations in Trinidad and Tobago, providing access to the global public data communications network for members of the public. Currently there are approximately 22 of these ISPs operating in Trinidad and Tobago.

4.5 Due to the growing trend of convergence, voice, image and data traffic are being carried throughout the world on packet-switched data communications networks such as Frame Relay , and in particular, the Internet Protocol (IP).

As a result of lower capital and operating costs, voice telecommunications are being provided using packet-switched networks at a significantly lower price. Currently the preferred method of transporting voice over a packet-switched

network is implemented using the Internet Protocol and is commonly referred to as "IP Telephony " and defined in Section 2.9. TATT is cognisant of the fact that in the future there may be additional methods by which voice may be transported as new technologies are developed.

IP Telephony has become such a critical issue in the sphere of telecommunications that The International Telecommunications Union (ITU) has indicated that:

" While there are a range of views as to the pace at which IP Telephony will grow in the coming years, it is commonly believed that it will increase fairly rapidly. IP Telephony is already believed to account for more than 3 per cent of international voice traffic. Worldwide the volume of traffic on IP-based and data networks already exceeds the volume of voice traffic that travels over the PSTN. Consequently few countries can ignore IP Telephony.

The growth of IP-based networks around the globe has profound and broad implications for societies, including consumers, industry, and national administrations. In part, this is because telecommunications infrastructure is increasingly being viewed as a fundamental element of national competitiveness in the age of the Information Society."[3]

4.6 In recent times, various forms of International Public Telecommunications Service and / or Network Providers have emerged in Trinidad and Tobago.

(i) The first form is the International Call Center, which accommodates in-house telephone facilities, and uses the Internet to carry the voice traffic originated locally to international destinations, terminating on the overseas Public Switched Telephone Network (PSTN).

(ii) The second, more discrete, form is the call termination provider, which purchases telephone facilities in order to complete calls that were originated internationally to subscribers in Trinidad and Tobago. The international voice traffic arrives at the call termination provider's facility using its Internet connection. Both forms can be referred to by the generic term Internet Telephony Service and / or Network Providers (ITSNPs). Currently there are approximately 120 of these Internet Telephony Service and / or Network Providers operating in Trinidad and Tobago.

(iii) A third form is the Internet Service Provider (ISP) which provides a service only for the delivery and exchange of data locally and internationally.

[3] International Telecommunications Union, Standardisation Section
Draft Report on the Implementation of IP Telephony in Developing Countries
Geneva 17-21, November 2003.

4.7 This policy seeks to address the relevant issues relating to any entity which provides a public international telecommunications service. Thus any service provider which meets this criterion as defined in Section 2.6 may be referred to as an International Public Telecommunications Service and/or Network Provider and will hereinafter be referred to as an 'IPTSNP'.

4.8 Currently the IPTSNPs do not contribute to the social and economic development programmes nor do they pay 3 % of their gross annual revenues as do TSTT. It is thus clear that there is an imbalance in the manner in which the IPTSNPs and TSTT operate.

4.9 Conversely, the presence of these IPTSNPs has made available a traditionally costly service at affordable rates, while providing an alternative to TSTT's international service.

5. Policy Considerations

5.1 **The Entrepreneur and Telecommunications**

The government of Trinidad and Tobago seeks to encourage medium, small and micro-sized entrepreneurial participation in the telecommunications sector.

As a means of fostering investment by these enterprises, free competition in the provision of telecommunication services will be encouraged to the extent where these enterprises can carve competitive niches in providing telecommunications services that are similar to those offered by macro-enterprises. In this regard, TATT will articulate strategies, policies, regulations and rules to bring these endeavours in tandem with the socio-economic development goals of the country.

Developments in telecommunications have been dominated by macro-domestic enterprises and transnational corporations since large amounts of investment in infrastructure and networks were required to deliver telecommunications services. Open networks have changed the dynamics of service provision as well as the quantum and format of investment that attend the delivery of services to end users. Technological innovations have ushered new economic modalities in the telecommunications market making it feasible for the inclusion of medium small and micro-sized enterprises to become viable service and/or network providers, particularly in end user markets.

The excursion of these enterprises in telecommunications markets is contingent on their assessment of the socio-economic and legal policies, regulations and rules to create a propitious climate for investment and interaction between the public and private sectors. Telecommunications entities take signals from public

and private sectors behavioural patterns since the basic components of investment in telecommunications have proven to be rooted in economic stability and social thirst for application of new technologies.

A collaborative effort is required among government, business, the regulatory authority and academic institutions to assess the timely application (with special attention to the type and quality) of emerging technologies on the basis of present and future requirements of end user services. A correct assessment of the potential and peculiarities of the local market will favour sound business decisions and thereby prevent business hiccups consequent upon a lack of due diligence.

A concerted combination of different magnitude of private sector players in telecommunications sectors has been one of the prime forces behind a more equitable distribution of development resources. TATT is cognisant that such cannot be attained without harnessing the tendency of enterprises to set up operations in urban communities because of the commercial attraction as compared to the that offered by rural communities. TATT is also aware of the tremendous socio-economic opportunities to be tapped by micro, small and medium-sized enterprises taking cutting-edged telecommunication services to rural communities.

It is envisaged that with appropriate opportunities, micro, small and medium-sized telecommunications enterprises can constitute a potent mechanism for employment creation and poverty reduction in rural communities.

To this end and as a means of promoting development with equity, TATT shall provide incentives that encourage these micro, small and medium-sized enterprises to locate their operations within ready access of rural communities through out the country. TATT also recognizes the central role that smaller-sized telecommunications business operations can play in creating and maintaining flows of trade opportunities in rural areas and therefore make important contributions to sustainable development. The policies of TATT shall include designs to facilitate and consolidate the incorporation of these enterprises that service Internet and voice via alternative means as bona fide business entities thus allowing them effective opportunity as universal service providers.

Micro, small and medium-sized enterprises will be encouraged to establish centres not simply to provide access to cheaper international voice and Internet services but to serve as distant training options where rural communities can access online training in marketable skills. Measures will be instituted to assist these enterprises to broaden the avenues to bring knowledge-based tele-available skills to rural inhabitants.

It is incumbent on all businesses to uphold the virtues of entrenched values in any society, in particular, a plural society as that of Trinidad and Tobago. As in the case of telecommunications service providers, TATT is required to regulate the activities in a manner which ensures strict compliance with

technical and accounting obligations, including audited accounting, financial and tax statements.

5.2 **International Public Telecommunications Service and/or Network Providers (IPTSNP)**

IPTSNPs can provide unidirectional access services, which may be either call initiation or call reception services, and may also provide bi-directional access services, in which its subscribers can both initiate and receive calls. In the case where the subscriber initiates the call, the service and/or network provider is providing call origination services. In the case where the subscriber is receiving the call, the service and/or network provider is providing call termination or call completion services.

Traditionally, revenues earned by international telecommunications services provided by the incumbent have been used to fund necessary social projects and programmes, including expansion of telecommunications access nationwide, development of community access centers in remote and rural areas, and the provision of fixed line access and unit rates.

5.3 Alternative public telecommunications networks are being developed, and have enabled the provision of international telecommunications services using mechanisms that bypass the traditional service provided by the incumbent. Hence, revenues needed to fulfill necessary social and economic objectives are being diverted by private enterprise venture.

5.4 The Telecommunications Authority of Trinidad and Tobago (TATT) recognizes the importance of encouraging innovation and competition in the telecommunications sector, and hence the intent of this policy is to develop a framework which ensures continued encouragement of innovation and technology advances, in order to provide infrastructure support for the realization of national policy objectives.

5.5 TATT also recognizes the growing trend among private enterprises to utilise private telecommunications systems and networks to meet their international telecommunications needs.TATT is cognisant of the capacity of private enterprises to provide international public telecommunications services and/or networks for members of the public, and the capability of the present forms of Internet Telephony providers to evolve into various forms and delivery modalities. The various means by which international public telecommunications services can be delivered requires this policy to be generic in its scope.

5.6 The private sector is reminded of its responsibility and duty to contribute to Trinidad and Tobago's social and economic development. Consequently, the practice of providing a service in a manner that can be viewed as having a

detrimental impact on the existing social and economic fabric of society by causing higher domestic telephone tariffs and the inability to expand telecommunications access to unprofitable areas will not be encouraged. This is emphasized when one considers that as more consumers have access to the national telecommunications infrastructure, more business opportunities and the demand for further services will be generated. This will bring greater benefits to all stakeholders, and not a select few, as is the case of unregulated IPTSNP operation.

5.7 Due to continued technological developments, telecommunications have evolved into advanced multimedia communications services. In this regard, services that provide interactive voice or a relevant substitute, which include but are not limited to video conferencing, to members of the general public shall be classed under the same regulatory framework to ensure the necessary social and economic development objectives are achieved.

6 International Developments relating to Internet Telephony

6.1 The Internet can be used as a public telecommunications network, for transporting, voice, image and data. Regulatory agencies throughout the world have been faced with the challenge of providing an appropriate regulatory framework to ensure effective development and sustenance of the telecommunications infrastructure and the required social programmes.

6.2 The following countries have implemented regulatory regimes albeit of different modes and degrees to address the issue of IP Telephony:
Cambodia, Canada, Hungry , India , Lithuania, Peru, Panama, Pakistan, Singapore ,Slovak Republic, Turkey and Uganda.

6.3 European Commission Telecommunications Directives are intended to converge and harmonise telecommunications regulation, advocating that the regulatory framework to be used across Europe should be technologically neutral. Internet telephony services are categorised as Publicly Available Telephone Services, which fall under the same regulation as traditional public telecommunications service providers, especially for the provision of Universal Service.

6.4 The Federal Communications Commission (FCC) of the United States has released a proposed rulemaking document in the matter of Internet Protocol (IP)-enabled voiced services, inviting comments on the regulatory treatment of Voice over IP (VoIP). The questions revolve around which VoIP services should be considered information services and which should be considered telecommunications services. The latter classification would require VoIP service

providers to fulfill Universal Service obligations where required, as well as serving as a public safety access point.

6.5 In a news release on 21st January 2004 from World Dialogue and Regulation newsroom, Panama will soon introduce a new scheme that taxes traditional and Internet phone calls at the same rate. Panama's regulator has estimated that Panama has lost US$12 million in taxes from the use of the Internet to make international telephone calls. Turkey and Pakistan are also expected to adopt new regulations similar to Panama's, which treat VoIP service providers the same as traditional phone providers.

6.6 The Canadian Radio-television and Telecommunications Commission has presented its preliminary view in April 2004 that voice telecommunications services using the Internet Protocol (IP) that utilise telephone numbers and/or provide access to and/or from the Public Switched Telephone Network (PSTN) have functional characteristics that are the same as circuit-switched voice telecommunications services. In the Commission's preliminary view, its existing regulatory framework should apply to VoIP services, including its determinations related to forbearance.

6.7 The International Telecommunications Union (ITU) has identified four VoIP usage scenarios according to terminal equipment and type of network[4]:

(i) **Scenario 1**

Call from IP-based Network to International Telecommunication Networks.

In this scenario communication occurs between IP-based network users and International Telecommunication Network users, in which the call set-up is originated by the IP network user.

In this configuration, the call is established within the IP-based network towards the international telecommunication networks as shown in Figure 1 below. Any added functionality to enable interworking should be provided in the IP-based network, unless otherwise agreed between the operators of the IP-based and international telecommunication networks.

In this PC to phone transaction, the computer device user connects to the Internet and employs an IPTSP to complete a call on the telephone

[4] International Telecommunications Union
Standardisation Sector , Geneva 17-21 November 2003
Extract of the report of the meeting of Working Party 1/3 held in Geneva from 16 to 20 June 2003 and of Recommendation E.370

network. The computer device user employs the IPTSP's services solely for outgoing calls.

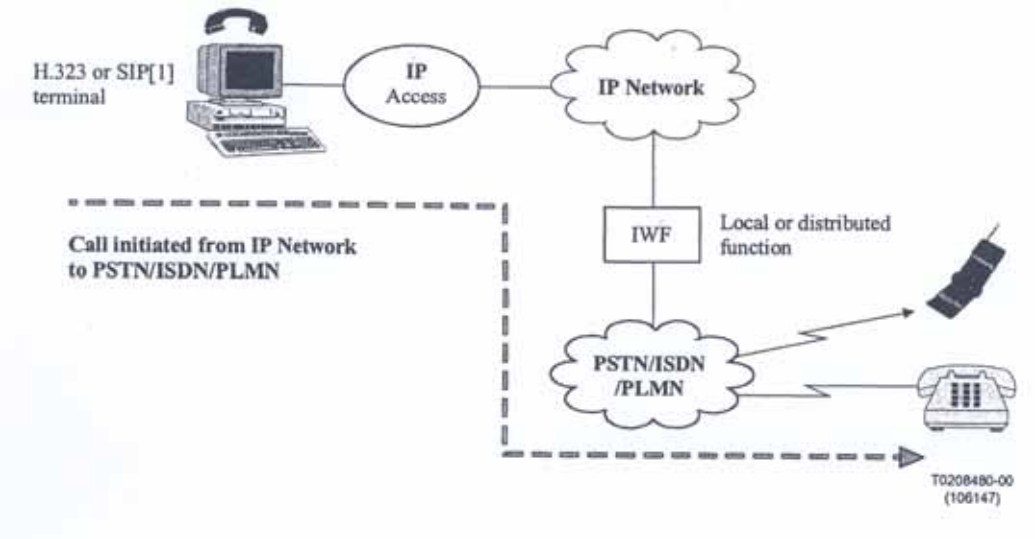

Figure 1. (Scenario 1)

Call from IP Network User to the International Telecommunication Network

Source: International Telecommunications Union
Standardisation Sector , Geneva 17-21 November 2003
Extract of the report of the meeting of Working Party 1/3 held in Geneva from 16 to 20 June 2003 and of Recommendation E.370

(ii) **Scenario 2**

Call from International Telecommunication Networks to IP-based Network

In this scenario communication occurs between IP-based network users and International Telecommunication Network users, in which the call set-up is originated by the International Telecommunication Network user.

In this configuration, a call is established from the international telecommunication networks towards the IP-based Network user as shown in Figure 2 below. Any added functionality to enable interworking should be provided in the IP-based network, unless otherwise agreed between the operators of the IP-based and international telecommunication networks.

In this Phone to PC transaction, the telephone subscriber dials the computer device user by dialing a typical phone number, while the computer device user employs an IP telephony provider that maps the telephone number dialed to his IP address.

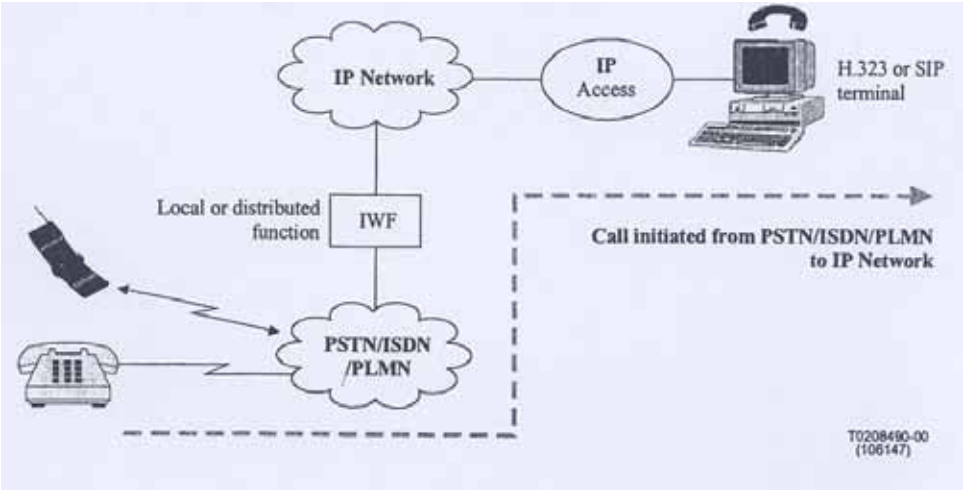

Figure 2 (Scenario 2)

Call from International Telecommunication Networks to an IP-based Network user

Source: International Telecommunications Union
Standardisation Sector , Geneva 17-21 November 2003
Extract of the report of the meeting of Working Party 1/3 held in Geneva from 16 to 20 June 2003 and of Recommendation E.370

(iii) **Scenario 3**

Interconnection of International Telecommunication Networks using IP-based network

In this scenario communication occurs between International Telecommunication Network users, using IP-based networks for the connection and trunking between the parties involved.

The IP-based network is provided by a separate entity from the international telecommunication network as shown in Figure 3 below. It does not include the case where IP technology is integrated within

the international telecommunication network of a single service provider.

Any added functionality to enable interworking should be provided in the IP-based network, unless otherwise agreed between the operators of the IP-based and international telecommunication networks.

In this Phone to Phone over IP scenario the calling and called parties are both subscribers to the public telephone network, and establish voice communications in the traditional way. Transparent to these parties, is the means by which the voice traffic is transported via an IP network, either through the use of gateways to the IP network by the telecommunications operators, or the use of adapters at the customer premises, which utilise Internet Service Providers or gateways to transport the voice traffic using the Internet.

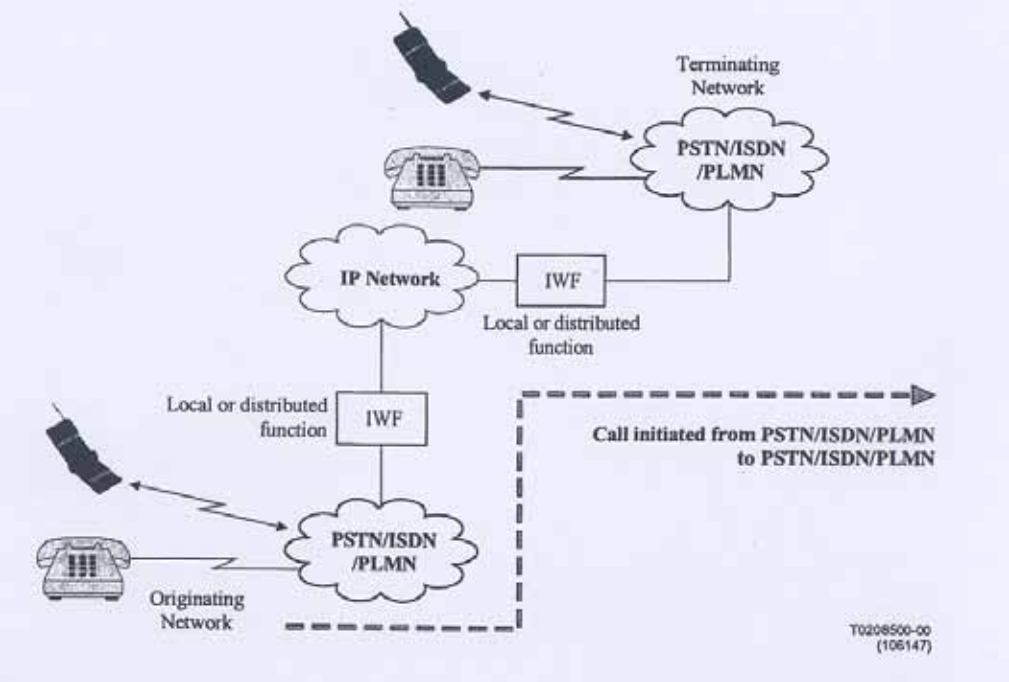

Figure 3 (Scenario 3)

Call from International Telecommunication Network to another International Telecommunication Network via an IP-based Network

Source: International Telecommunications Union Standardisation Sector , Geneva 17-21 November 2003
Extract of the report of the meeting of Working Party 1/3 held in Geneva from 16 to 20 June 2003 and of Recommendation E.370

(iv) **Scenario 4**

Interconnection of IP-based networks using International Telecommunication Networks.

In this scenario communication occurs between IP-based network users, using International Telecommunication Networks for the connection and trunking between the involved users.

In principle the interworking between the IP-based network and the international telecommunication network can be at any level in the international telecommunication network hierarchy, for example, local exchange, transit exchange, international exchange.

In this PC to PC scenario the calling and called parties both have computer devices, such as personal computers and /or personal digital assistants that enable them to connect to the Internet, and employ voice applications on these devices to establish voice communications.

In this case, the IP-based network is provided by a separate entity from the international telecommunication network as shown in Figure 4 below. It does not include the case where IP technology is integrated within the international telecommunication network of a single service provider.

Any added functionality to enable interworking should be provided in the IP-based network, unless otherwise agreed between the operators of the IP-based and international telecommunication networks.

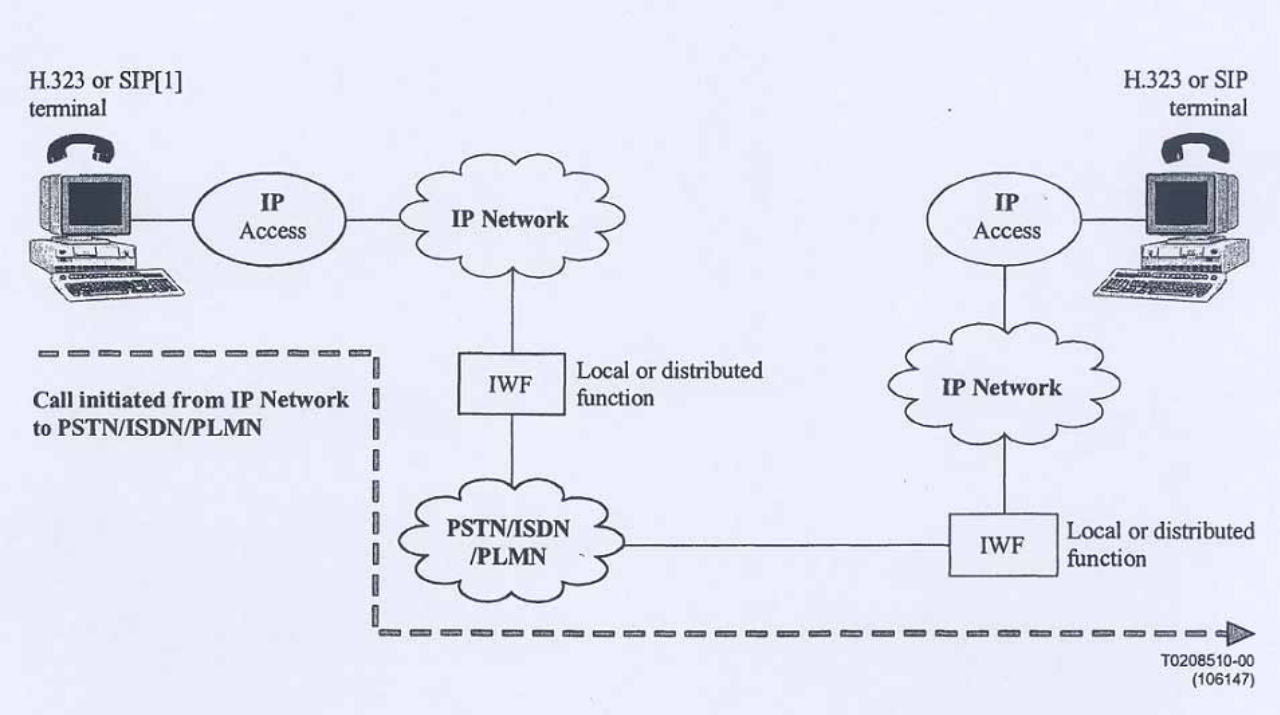

Figure 4 (Scenario 4)

Call from an IP-based Network user to another IP-based Network user via an International Telecommunication Network.

Source: International Telecommunications Union
Standardisation Sector , Geneva 17-21 November 2003
Extract of the report of the meeting of Working Party 1/3 held in Geneva from 16 to 20 June 2003 and of Recommendation E.370

The ITU has recommended that countries consider a technology neutral approach in regulating like services in a competitive market, while universal service and/or access programmes will be fundamental to provide service to all users in circumstances where the market fails to provide telecommunications services to certain subsets of users, such as subscribers in rural and remote areas[5].

[5] International Telecommunications Union, *The Essential Report on IP Telephony*, 2003, by the Group of Experts on IP Telephony/ ITU Telecommunications Development Bureau (ITU – D)

7. Cost Structures

Examining the cost structures of circuit-switched and packet-based telecommunications networks is useful in terms of

(i) **Comparison of investment costs.**

Traditionally costs and quality issues were dominated by the trunk and long distance networks but they are now dominated by the access networks[6]. Regulatory models are based on the assumption of an expensive core network. However the "core network" is now relatively inexpensive especially with the advent of voice over packet switched technology see Figure 5 and Figure 6.
There may be up to a 70 per cent saving in capital and operating costs for the packet based operator.
This results in substantial lower access prices for packet based operators compared with circuit-switched operators.

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Old and new cost and regulatory models

Old Circuit Switched Model.

Regulation was based on this model

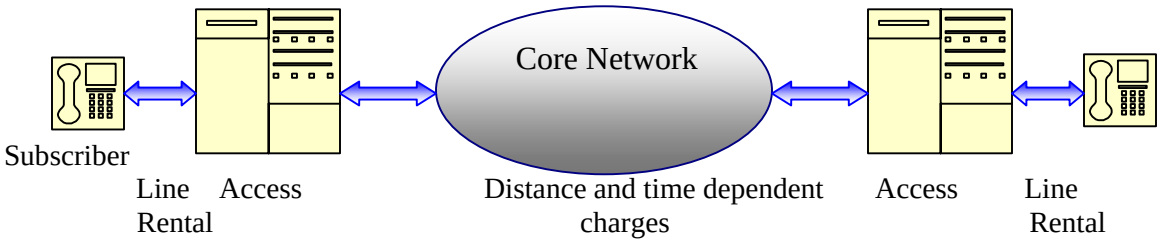

Figure 5.

[6] Horrocks Technology , Sunrise Consultants July 2004

New Packet switched model (simplified)

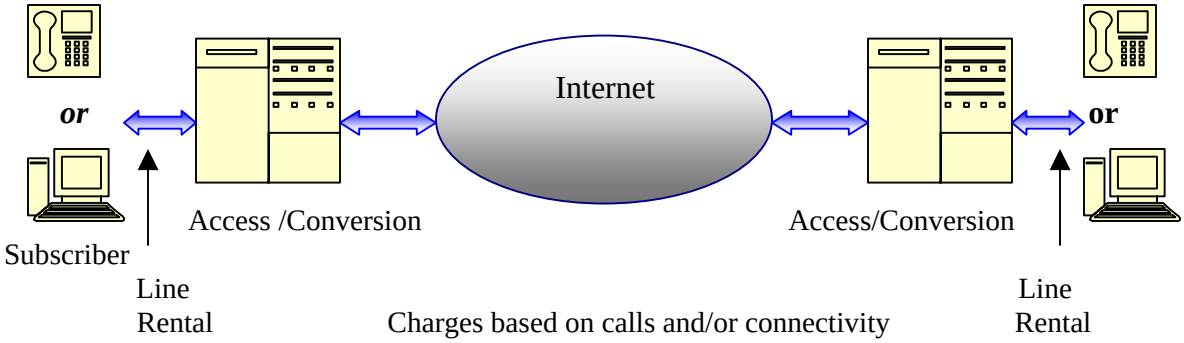

Figure 6.

(ii) **Call Pricing**

The costs associated with circuit-switched networks were and are currently dependent on distance and duration of call. However the cost of transporting voice over packet-based networks has a weaker dependency on distance or duration thus IPTSNPs can provide a flat-rate pricing regime for international calls. Additionally due to substantial savings as mentioned in (i) above packet-based operators can offer services between 30 to 50 per cent lower than traditional circuit-switched operators.

(iii) **Cost and Tariff**

The costing and tariff models for traditional circuit-switched telephony have evolved into fairly efficient forms. The same cannot be said for packet-based services. The key issue here is whether charges for packet-based services will be based on distance and time or only on time of use.

Part III Section 29 Sub Section 3 of the Telecommunications Act 2001 empowers TATT to "regulate prices for public telecommunications services and international incoming and outgoing settlement tariffs by publishing pricing rules and regulations."[1]

Pricing for IPTSNPs should be based on time of use rather than distance and time.

Tariffs based on the cost of the underlying network elements for packet-based Service and/or network providers will be impossible to accurately quantify.

Thus a fixed tariff for international public telecommunications services and/or networks using non-circuit technology is the most appropriate approach.

The actual tariff charges will be approved by TATT as part of the regulations for International Public Telecommunications Services and/or Networks.

While TATT recognises that a reduction in international calling rates is beneficial for the average consumer the mechanism for this benefit must be regulated in a fair and transparent manner. TATT is cognisant that competition and competitive rates for international communications services and/or networks is desirable for the general public and the development of the telecommunications industry.

8. Quality of Service

Quality of Service is a key concern for packet-based services especially voice when the Internet is used.

One of the major challenges in packet-based telephony is the realisation of a similar Quality of Service compared with that of traditional circuit-switched telephone networks.

These challenges may be categorised into:

a. Technical considerations which degrade the quality of the communication and which may be summarised as follows:

(i) **Loss**: The loss or disappearance of packets during communication.

(ii) **Delay**: The total time for transmission of packets from source to destination including the time taken to reorder the packets and compensate for variations in transit time.
A delay of less than 400ms must be achieved before an interactive voice conversation can proceed in a meaningful manner.

(iii) **Jitter**: The variation in packet arrival delay.

(iv) **Echo**: The delay between the transmission of a signal and receipt of the same signal as an echo.

b. The organisation and provisioning of packet-based services especially in relation to network access and interconnection.

8.1 **Performance Bond**

TATT is committed to Quality of Service Standards for the provision of international voice and/or data services for the general public.

The IPTSNPs who are awarded concessions will be responsible for providing their customers with an acceptable Quality of Service pursuant to Part IV Section 45 of the Telecommunications Act 2001 and the rules and regulations set forth by TATT.

Consideration will need to be given, therefore, to the establishment of a Performance Bond by the IPTSNPs in order to ensure that acceptable service quality levels are maintained.

The relevant regulations of TATT will specify the quantum, structure and all other necessary information in relation to the Performance Bond.

9. Numbering

Thus far, regulatory agencies have focused on whether packet-based voice services should be given numbers in the existing geographic number ranges, or put into a new non-geographic range. Agencies are concerned that using a geographic range may result in number exhaustion (especially if packet based voice users require numbers in more than one geographic area, as is happening in the USA, or want more than one number to represent different packet-based services). They are also concerned that users will expect the same range of services and quality of services associated with the PSTN if geographic numbers are used. Furthermore, the fixed location implied in a geographic number range will be undermined by the ease with which the user can carry a laptop computer, and thus call from another location using say VoIP technology for example. In the United Kingdom, Ofcom has suggested that if packet-based voice services can satisfy the Public Access Telecommunications Service requirements, they should have geographic ranges; if not, they should use a new non-geographic number range.

At present the European Regulators are tending towards giving packet-based voice services non-geographic number ranges on the grounds that this will signal a different level of functionality and quality than that available on the PSTN.

There is also a potential threat to the E.164[7] numbering scheme if Internet based services adopt numbers that look like E.164 but have not been allocated through the formal channels. This practice is starting in some countries.

[7] ITU Recommendation E.164 –Universal Numbering Scheme

Consideration will need to be given, therefore, to the assignment of numbers to the IPTSNPs.

Currently under the North American Numbering Plan (NANP) which is applied in Trinidad and Tobago there is capacity for up to eight million numbers and in the future with the expansion of the NANP the quantity of available numbers will increase to eighty million. As such, the issue of non-availability of numbers should not arise once this resource is responsibly managed.

10. Access to emergency services

Packet-based voice service providers may not provide adequate access to emergency services. There are problems and challenges in identifying the relevant emergency service provider and in routing calls to it. In many cases IPTSNPs may not provide calling line identity (CLI), which is used as a check on location and for returning calls. Even if CLI is available it will refer to the home location and not the current location of the caller when the caller is "nomadic". In addition because packet-based services are powered by mains electricity, they will not be available if mains power is disrupted during an emergency. Although these objections may be exaggerated, some packet-based providers in the USA give their customers the opportunity to register their location. Without CLI, the call handlers in the emergency centres will ask for the caller's location, as they have to for emergency calls from mobile phones and in centres that do not provide CLI. If mains power is lost, many packet-based customers will have access to emergency services via a separate PSTN line or their mobile phone[6].

IPTSNPs may therefore be required to provide CLI or access to Emergency Services.

11. Security

Security has become one of the most important aspects of the global telecommunications industry from the points of view of law enforcement personal and financial privacy.

The most important features of network security may be summarised by the following:

(i) **Confidentiality**: Whereby call protection between two or more parties against illegal tapping or monitoring by an unauthorised third party.

TATT is cognisant of the fact that as a result of the increased concern about security in the world in general and in Trinidad and Tobago in particular, law enforcement agencies may want the ability to legally log and monitor packet-based calls.

(ii) **Authentication**: Whereby the certainty that data received is actually from the stated sender. Currently Digital Signatures and Digital Certification techniques are the preferred methods employed by networks to ensure data authentication.

(iii) **Access Control**: Whereby access to network elements is restricted in accordance with the enforced security policy. This reduces or eliminates the probability of unauthorised access to critical network resources and consequently the advent of malicious acts.

(iv) **Integrity**: Whereby the receiver is certain that the received data has not been tampered with or monitored by any unauthorised third party. Currently Public Key Encryption is the preferred method used by many networks to ensure data integrity.

The security problems caused by the universal use of telecommunications networks to commit various forms of crimes are well documented. In order to minimise incidences of cyber-criminal activities, where necessary, the operations of these enterprises will be subject to ex-ante regulations that censor any form of information which is inimical to the peace and security of the State. To this end, these policies and regulations will guided by the item 7 of the Montevideo, Organisation of American States (OAS) declaration that calls for:

"Private sector cooperation to facilitate the resolution of terrorist and related crimes that involve the use of global telecommunications network. "

Internet Service Providers who claim to offer so called Secure Internet Services to their customers should be required to address and satisfy the requirements listed in (i) through (iv) above before a viable Secure Internet Service can be provided.

12. Directory Enquiry and Operator Services

IPTSNPs which provide packet-based services and telecommunications services should be required to provide Directory Enquiry and Operator Services, either directly or through another organisation. These services may be improved with IPTSNPs because they can be provided in association with the enabling computer based features, such as, on-line directories[6].

13. Policy Guidelines and Prescriptions

13.1 **Technological Neutrality**

TATT, in conformance with the trends being adopted globally by telecommunications administrators and regulators, shall adopt technological neutrality in its determination and classification of telecommunications services, and shall be guided by the service being provided rather than the technology used to provide such service.

13.2 **Classification of international public telecommunications service and/or network providers.**

The providers of international public telecommunications services and/or networks to members of the general public shall be classified as providing a public telecommunications service. Accordingly, entities that facilitate the completion of any manner of telecommunications for members of the public with parties internationally, either originating or terminating in Trinidad and Tobago, shall be classified as international public telecommunications service and/or network providers, and in accordance with Part III Section 21 of the Telecommunications Act 2001, shall require a concession granted by the Minister.

International public telecommunications service providers include, but are not limited to:

(i) Parties connected to a public telecommunications network or service provider that offer services to the public by initiating and/or terminating any manner of telecommunications sessions with parties abroad.

(ii) Parties operating a public telecommunications network that transports any manner of telecommunications traffic to enable communication to occur between members of the general public and parties overseas.

(iii) Parties providing international telecommunications services that provide interactive telecommunication or a relevant substitute, which includes but is not limited to video conferencing, to members of the general public.

13.3 **Concession Requirement**

A service provider which offers international public telecommunications services, or operates public telecommunications networks that can be used for telecommunications by other public telecommunications service providers, is required to have a concession granted by the Minister, pursuant to Part III Section 21 of the Telecommunications Act 2001.

A service provider which utilises its telecommunications facilities and its connections to public telecommunications networks to provide international public telecommunications services to members of the public, whether by providing telecommunication origination or termination or both, is required to have a concession granted by the Minister, pursuant to Part III Section 21 of the Telecommunications Act 2001.

13.3 **Existing international public telecommunications service and /or network providers.**
Application and registration with TATT.

A service provider which is currently offering international public telecommunications services and/or networks without a concession prior to the development of this policy, has a period of six months from 1st July ,2004 within which time the service and/or network provider must submit an application with TATT for a concession to provide international public voice telecommunications services and/or networks, subject to the rules and regulations of TATT.

These international public telecommunications service and/or network providers are also required to register with TATT under the registration rules and regulations prescribed by TATT.

Registration with TATT does not mean or imply that the international public telecommunications service and/or network provider is or will be automatically granted a concession.

Registration with TATT will be according to the guidelines as prescribed by TATT and which are outlined in Appendix I of this policy document.

13.5 **Existing international public telecommunications service and/or network providers.**
Failure of application.

If a service provider does not fulfill the requirements as stipulated by TATT to be awarded a concession to provide an international public telecommunications service and/or network, an opportunity will be given to the IPTSNP to meet the

stipulated requirements. However, if these requirements are not met, the IPTSNP should be required to cease provision of such services.

13.6 **Existing international public telecommunications service and/or network providers.**
Penalty for operating without a concession.

Upon fulfillment of requirements stipulated in 14.5 above, the service provider can then re-apply to be awarded the relevant concession. Any operation by the service provider or its agents to provide international public telecommunications services without a concession shall make the service provider liable to the fines and penalties defined by the Part IX Section 71 of the Telecommunications Act 2001.

13.7 **Existing international public telecommunications service and/or network providers.**
Facilities or Access Services to other parties.

Public telecommunications networks or service providers that provide facilities or access services to other parties that intend to or are providing international public telecommunications services are required to ensure that these parties have concessions to provide their services. Network or service providers are required to ensure that if their subscribers commence operations to provide international public telecommunications services, that these subscribers secure the required concessions.

If the required concessions are not received the network or service providers must terminate forthwith the provision of services to these subscribers. If these providers do not apply the necessary due diligence to ensure that international public telecommunications service providers using their public telecommunications network or service have a concession, these providers will be subject to the relevant fines and penalties as defined by the Telecommunications Act 2001.

13.8 **Existing international public telecommunications service and/or network providers.**
Concession and Surcharge Fees.

(i) **Concession Fee**
An annual Concession Fee will be levied on all International Public Telecommunications Service and/or Network Providers operating in the Republic of Trinidad and Tobago.

The details of this fee structure and all other necessary information shall be in the relevant regulations of the Telecommunications Authority of Trinidad and Tobago.

(ii) **Surcharge Fee**

Any overdue Concession Fees shall attract a Surcharge Fee.

The details of this fee structure and all other necessary information shall be in the relevant regulations of the Telecommunications Authority of Trinidad and Tobago.

Failure to remit Concession and/or Surcharge Fees to TATT shall result in the suspension or termination of said concession pursuant to Part III Section 30 of the Telecommunications Act 2001.

The fees stipulated in this policy are part of the new licence and concession pricing regime of TATT and are subject to change by the regulations of TATT.

International Public Telecommunications Service Providers shall be required to contribute to the Universal Service Programme of TATT.

The concession fee and surcharge payment process and compliance measures pursuant to the above policy will be in accordance with the rules and regulations of TATT.

13.9 **Performance Bond**

International Public Telecommunications Service and/or Network Providers who are awarded a concession will be required to post a Performance Bond with TATT.

The relevant regulations of TATT will specify the quantum, structure and all other necessary information in relation to the Performance Bond.

13.10 **Existing international public telecommunications service and/or network providers.**
Inspection of facilities by officers of TATT.

TATT reserves the right in accordance with Section 50 of Telecommunications Act 2001 to determine whether an individual or company which has the necessary facilities to provide international public telecommunications services and does not have the required concessions are in fact providing said services.

13.11 **Operation by international public telecommunications service and/or network providers without a concession.**

An individual or company which has not applied for or was not granted a concession to provide international public telecommunications services and/or networks, but is determined upon investigation by TATT to be providing such services and/or networks, shall be liable to the fines and penalties as prescribed by the Telecommunications Act 2001 and the regulations of TATT.

13.12 **Non-compliance with the Concession**

Concessionaires that do not comply with TATT's terms and conditions as stipulated in the concession document, as well as any other requirement as determined by the Telecommunications Authority, will be subject to the fines and penalties as prescribed by the Telecommunications Act 2001 and the regulations of TATT.

13.13 **Compliance and Due Process.**

Concessionaires that do not comply with TATT's terms and conditions as stipulated in the concession document, as well as any other requirement as determined by the Telecommunications Authority, will be subject to due process under the Telecommunications Act 2001 and the regulations of TATT which will include warning correspondence of concession breaches, fines, suspension and/or termination of concession.

13.14 **Use of International Public Telecommunications Service and/or Network Providers as Educational Entities and as vehicles for the Fast Forward Initiative**

TATT is cognisant of the important role the private sector will play in the realisation of the Government's National Information and Communication Technology (NICT) Strategy and ultimately towards the realisation of Vision 2020.

TATT will thus introduce in its policies and regulations mechanisms which will encourage and assist those corporate entities who have taken the initiative to contribute to the expansion and advancement of educational facilities within the framework of the Government's NICT Strategy.

13.15 **Application Forms**

All current and future International Public Telecommunications Service and/or Network Providers will be required to complete the relevant application form in its entirety in order to obtain the concession. This application form will only be available from the offices of TATT at 76 Boundary Road , San Juan. Any application received without the completion of the relevant application form obtained from TATT will not be accepted or processed by TATT.
Current International Public Telecommunications Service and/or Network Providers have until 4.00 PM on 31st of December 2004 to submit to TATT the completed application forms with all the necessary and relevant information enclosed.

Future International Public Telecommunications Service and/or Network Providers will also be invited by TATT to apply for a concession.

13.15 **Application Process**

All applications to provide an International Public Telecommunications Service and/or Network will be treated by TATT in a fair, non-discriminatory and transparent manner.

The procedures for the processing of each application will be stipulated in the relevant regulations of TATT.

Where an application has been rejected the applicant will be furnished upon request written justification for the said rejection.

Appendix I outlines the criteria for the recommendation or rejection of the application from TATT to the Minister.

14. Abbreviations

FCC	Federal Communications Commission of the United States of America
IP	Internet Protocol
ISP	Internet Service Provider
ITSP	Internet Telephony Service Provider
IPTSNP	International Public Telecommunications Service and/or Network Provider
ITU	International Telecommunications Union
PSTN	Public Switched Telephone Network
TELCO	Telephone Company of Trinidad and Tobago
TEXTEL	Trinidad and Tobago External Telecommunications Company
TSTT	Telecommunications Services of Trinidad and Tobago
VoIP	Voice over Internet Protocol

15. References

1. The Telecommunications Act 2001.

2. Agricultural Development Bank.

3. International Telecommunications Union, Standardisation Section
   Draft Report on the Implementation of IP Telephony in Developing Countries
   Geneva 17-21, November 2003.

4. International Telecommunications Union
   Standardisation Sector , Geneva 17-21 November 2003
   Extract of the report of the meeting of Working Party 1/3 held in Geneva from 16 to 20 June 2003 and of Recommendation E.370

5. International Telecommunications Union, *The Essential Report on IP Telephony*, 2003, by the Group of Experts on IP Telephony/ ITU Telecommunications Development Bureau (ITU – D).

6. Horrocks Technology, Sunrise Consultants July 2004

7. ITU Recommendation E.164 –Universal Numbering Scheme.

16. APPENDIX I

INFORMATION REQUIRED FROM MICRO, SMALL AND MEDIUM-SIZED INTERNATIONAL PUBLIC TELECOMMUNICATIONS SERVICE AND/OR NETWORK PROVIDERS FOR REGISTRATION PROCESS

1. Company Information needed for Registration Process

a. Name of Company.
b. Address and telephone number of Head Office of Company.
c. Addresses and telephone numbers of all Branch Offices of Company.
d. Name, Address and telephone number of Managing Director and/or Chief Executive Officer of Company.

Note: Registration with TATT does not mean or imply that the international public telecommunications service and/or network provider is or will be granted a concession

17. APPENDIX II

INFORMATION REQUIRED FROM MICRO, SMALL AND MEDIUM-SIZED INTERNATIONAL PUBLIC TELECOMMUNICATIONS SERVICE AND/OR NETWORK PROVIDERS FOR APPLICATION PROCESS

Applications shall be written in English, and shall include, but not be limited to, the following:

NOTE: The Telecommunications Authority of Trinidad and Tobago reserves the right to verify any information submitted by the applicants, without unnecessary hindrance.

A. INFORMATION REQUIRED FROM BUSINESS PLAN

Specific information will be required when assessing a business plan for applying for a concession to provide an international public telecommunications service and/or network. The following information should be provided where applicable:

1. General Information

1.1 Company Information

Company information is required about the applicant, including:

a) Date and place of incorporation.

b) Size of company (including number of staff, company locations, etc).

c) Full names and addresses of all directors, identifying executive and non-executive positions.

d) Disclosure of any criminal record or personal bankruptcy of any person listed in c).

e) Details of bankers, consultants, lawyers, auditors and other professional advisors appointed or proposed by the applicant.

f) Description of principal business activity and principal place of business.

g) Copy of the audited annual financial report for the last three years.

h) List of any affiliations / relationships with other corporations.

i) The name of a nominated contact person involved in the request for proposal including email, telephone, facsimile and postal contact details.

j) Any other information that the disclosure or non-disclosure of which may materially affect the application in the evaluation process.

1.2 Consortium Information

The following additional information is required where an applicant is a consortium or joint venture:

- The role and contribution of each consortium member in terms of resources, experience or expertise.

- The nature of the relationship between members including a copy of the details of any joint venture agreement, memorandum of understanding or shareholder agreement.


Details of the proposed management structure and corporate governance in the event that the applicant is awarded the concession.

2. Financial Projections

A comprehensive financial plan must be developed and submitted. This plan will include a feasibility analysis for the development of the network and the company's operations. A financial projection for 3 years must also be submitted. This must include:

- All assumptions made in estimating and forecasting costs. The financial projections should be calculated assuming constant prices.

- Annual balance sheet.

- Annual profit and loss accounts.

- Annual cash flow statement.

- Relevant accounting ratios.

3. Financial Strength and Stability

Evidence should be given to support the applicant's ability and provisioning to realise the financial plan, and by extension, the proposed business plan. In particular, the applicant should provide the following:

- Evidence of existing long-term financial resource and capitalization.

- Description of financial capacity, investments, revenues, resources of finance.

- Submission of financial references.

4. Technical Proposal

The following information must be provided in the business plan to assess the technical feasibility of the facility and its compliance to the regulatory requirements:

- System Overview – The technology used must be stated and adhere to international standards of design and operation. The system overview should contain information on network plan / topology (or any relevant schematics), type of radio communication equipment used (where applicable), desired frequency of operation and desired coverage area of system

- Quality of Service – the applicant shall state the level of quality of service the customer can be assured, in the delivery of the desired services, and the customer related services.
  Each applicant must have a customer service plan and a dedicated
  Customer Service Department in order to resolve consumer complaints and concerns.

Note :Information submitted will be judged on compliance and completeness

18. APPENDIX III

CRITERIA FOR RECOMMENDATION OR REJECTION OF APPLICATION

1.Evaluation Criteria

All proposals shall be evaluated against the criteria as stated below in Table 1. The information contained in the applicant's proposal, as per Section 17 Appendix I of this policy document will form the basis for evaluation. The following are the criteria and the associated weightings that shall be used in the evaluation exercise.

ITEM	CRITERIA	MAXIMUM WEIGHTING %
1	General Information	**30**
2	Financial Projections	**20**
3	Financial Strength and Stability	**20**
6	Technical Proposal	**30**
	Total	**100**

Table 1

An applications will either be recommended to the Minister or rejected based on the criteria as stated in Table 1 above.

Any application scoring less than half of the stated weighting value per criterion item will not be eligible for recommendation.
For example, an application must score 15 percent or greater in the General Information criterion for it to be considered for recommendation.

Applications scoring 60 percent or less in total according to the weighting criteria in Table 1 will not be eligible for recommendation for a concession to the Minister.