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A Consultative Document

**Fees Structure Re: Concessions and
Licences for the Provision of
Telecommunications & Broadcasting
Resources (network and/or service) in
Trinidad and Tobago.**

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Maintenance History		
Date	Change Details	Version
April 8, 2005	Initial Draft	0.1
May 20, 2005	McCarthy Tétrault commentary	0.2
June 14, 2005	Revised Draft	0.3
August 31, 2005	Revisions made based on comments and recommendations received from the first consultation phase.	0.4

1 Objective Function

This document establishes a fee structure comprising methodologies and formulae (a structure) to determine concession and licence fees in respect of the provision of telecommunications and broadcasting resources (network &/or services) in the Republic of Trinidad and Tobago. The part of the fee structure relating to concessions is predicated, in the main, on section 3 of the Telecommunications Act, 2001 (hereinafter referred as the Act) which mandates the Authority to create a regulatory environment that, inter alia:

- a) Encourages fair competition;
- b) Facilitates orderly development of a telecommunications system that serves to safeguard, enrich and strengthen the national social, cultural and economic wellbeing of the society;
- c) Promotes and protects public access to telecommunications services;
- d) Ensures that services are provided to persons with the financial and technical wherewithal to access those services;
- e) Protects end users' right to quality and variety of services;
- f) Provides for universal access; and
- g) Encourages provider investment in telecommunications infrastructure and services.

The fee structure for concessions is reflective of section 52 (2) (a) to (c) of the Act which basically limits the charging methodology of the Authority to recovery of costs incurred to:

- a) to provide services to concessionaires; and
- b) for its operation and administration.

The carpentry of the structure for licence fees mirrors the requirement at section 41 of the Act: to promote economic and orderly use of frequencies and recover the cost incurred to manage the spectrum.

It follows that the critical parameters of the fee structure for telecommunications and broadcasting services concessions and licences should be those that:

- i. Ensure the management (services, administration and operational) costs of the Authority is recovered; and
- ii. Reliably estimate the market value of spectrum used for the network and or service purposes in a manner which:
 - (a) encourages investment and offers end users reasonable prices for quality resources,
 - (b) ensures ubiquitous access to telecommunications and broadcasting resources in the country.

1.1 Regulatory Charge

A Regulatory Charge comprises:

- (a) an Administrative Charge, the proportion of the total expenses of the Authority specific to the administration of concessions and licences which is allocated to each concession or licence; and
- (b) an Operating Charge, the proportion of all total managerial expenses in the operation of the Authority allocated to each concession or licence.

The Regulatory Charge is applicable for the year_{t+1}. The allocation of Regulatory expenses between concessions and licences is given at Table I of this document.

1.1.1 Administrative Charge

An Administrative charge is denominated as a percentage of the total administrative cost of the Authority in a fiscal year. The administrative cost comprises all activity-based annual expenses incurred by the Authority to regulate concessions and licences under its jurisdiction. Such expenses include, but are not limited to:

- a) Preparation and review of policies, regulations and procedures which attend concessions and licences;
- b) Preparation of concession and licence application forms;
- c) Processing of concession and licence applications, including gazetting and publication of applications in daily newspapers;
- d) Renewal of concessions and licences;

- e) Investigating complaints of concessionaires and licensees and resolving disputes;
- f) Establishing and maintaining the financial system for assessment and collection of concession fees;
- g) Purchase of books, periodicals and training material to aid efficient management of concessionaires and licensees;
- h) The Authority's activity expenses which are specific to licences in respect of:
 - i. inspection of towers
 - ii. investigating and resolving occurrences of harmful interference
 - iii. purchase, installation and maintenance of a spectrum management system and infrastructure including radio monitoring station equipment, direct finders, computer hardware & software and amortization of building
 - iv. scientific research including purchase of scientific literature
 - v. electromagnetic compatibility analysis, frequency assignment, coordination, etc.

1.1.2 Operating Charge

An Operating charge is a percentage allocation of the total operating costs of the Authority in a fiscal year. Operating cost consists of annualized capital and recurrent expenses of the Authority that are not directly attributable to the administration of any single concession or licence. Such expenses include but are not exclusive to:

- a) Rent
- b) Board emoluments
- c) A portion of staff emoluments not apportioned to concessions and licences,
- d) Other goods and services
- e) Building maintenance contracts
- f) Office equipment, furniture and other materials
- g) Transport cost
- h) Utilities
- i) Training
- j) Courier services

- k) Public relations and promotions
- l) Other legal expenses
- m) Research and development ,
- n) Insurance, etc.

1.2 Concept of Market Value

In a competitive environment the market is the mechanism through which a fair price (market price) of a resource is established. The market price of a resource usually reflects, inter alia, its economic rent or the opportunity cost; either is contingent on the degree of scarcity and substitutability of said resource. The economic rent is the actual or indicative value attached to a resource by its most efficient or potentially most efficient user. The opportunity cost indicates the highest foregone return from the use of a resource. Both concepts are crucial to investment decisions and efficient usage of spectrum resources, as required under the Act. In satisfying section 41 of the Act, market valuation of spectrum will be applied to each licence premised on promoting economic utilization of frequencies.

1.3 Socio-Economic & Cultural Welfare

Concession and licence fees for telecommunications and broadcasting services must strike a delicate balance between market values, on one hand, and ubiquity, affordability (in particular, persons disadvantaged by health and economic circumstances) and cultural development on the other. This enjoins the Authority to ensure that concession and licence fees do not redound in end user fees which are inimical to nation wide access to the services, in particular those that promote and sustain indigenous culture.

1.4 Constituents of Concession Fees

A concession fee for any concession shall be the equivalence of the applicable Regulatory Charge, i.e. :

- a) An Administrative Charge, the proportion of the Authority's total administrative cost allocated to the concession; and

- b) An Operating Charge, the proportion of the Authority's total operating expenses allocated to the concession. .

1.5 Constituents of Licence fees

A licence fee shall comprise:

- a) a Regulatory charge inclusive of a proportion of the Authority's total administrative cost allocated to each licence ; and a proportion of the Authority's total operating expenses allocated to each licence; and
- b) a Spectrum Charge consistent with the economic value and efficient usage of the frequency band.

2 Concept & Categories of Concessions

A concession is a right given by the State under section 21 of the Act to provide a telecommunications and/or broadcasting resource to the general public. In this document, “resource” means network or service or a combination of both. As indicated at Figure 1, a concession may be network specific, service specific or both.

A network-specific or network-based concession is an authorization to operate a public telecommunications network, with or without the provision of public telecommunications or broadcasting services. In accordance with the Act, a public telecommunications network refers, but is not limited to, any of the following networks:

- Domestic Fixed Telecommunications Network (DFTN)
- Domestic Mobile Telecommunications Network (DMTN)
- International Telecommunications Network (INTN)

A service-specific or service-based concession is an authorization granted under section 21 of the Act to provide a public telecommunications service and/ or broadcasting service, without operating a public telecommunications network.

A more detailed classification of concessions is given at Table 1.

Table 1

Type	Concession Category	Authorization
<i>Type 1</i>	<i>network-based:</i>	to own or operate a public telecommunications network, without the provision of public telecommunications or broadcasting services.
<i>Type 2</i>	<i>network-based</i>	to own or operate a public telecommunications network in addition to providing public telecommunications and/ or broadcasting services over that network.
<i>Type 3</i>	<i>network-based</i>	to operate a virtual public telecommunications network in addition to providing public telecommunications and/ or broadcasting services over that virtual network.
<i>Type 4</i>	<i>service-based</i>	to provide a specific public telecommunications service without an authorization to operate a telecommunications network.
<i>Type 5</i>	<i>service-based</i>	to provide a broadcasting service without an authorization to operate a telecommunications network.
<i>Type 6</i>	<i>(Class Concession, service-based)</i>	to provide a specific public telecommunications service that warrants a lighter regulatory approach

3 Categories of Licences

In accordance with section 36 of the Act, licences are mandatory to provide radiocommunication services and operate radiotransmitting equipment. Fundamental to the provision of radiocommunication services and operation of radiotransmitting equipment is the use of spectrum.

Two parent categories of licences are proposed by the Authority:

- (a) Licences associated with the supply of public telecommunications or broadcast resources for which concessions are also required; and
- (b) Licences which apply to specific closed user group(s) or personal user(s), and as such, do not accompany concessions since the licensees are not permitted to deliver resources to the general public.

The sub-categories of licences proposed by the Authority are detailed at Table 2.

Table 2

Licence Sub-Category
Aeronautical
Amateur and CB
Broadcast
Special events
General Radiocommunication
Satellite
Maritime
Public Mobile
Test & development
Class

4 General Formula Re: Concession Fees

Concession fee per annum, CF_i applicable to a specific type of concession j ($j = 1$ to N) is equal to the Regulatory Charge, RCC_i specific to that concession, i.e.:

$$\begin{aligned} 1. CF_i &= RCC_i \\ &= \alpha_i + \beta_i \end{aligned}$$

Where:

α_i = the Administrative Charge, ; and

β_i = the Operating Charge,

4.1 Formula Re: Administrative Charge

The Administrative charge per concession, α_j is derived using the formula:

$$2. \alpha_j = TAEc_i/N$$

Where:

N = number of concessionaires in the category at Table x where concession j is classified;
and

$TAEc_i$ = total expenses incurred by the Authority to administer all concessions in the category where concession j is classified according to types given at Table x.

$$3. TAEc_i = \sigma_i(TAE_c)$$

Where

σ_j = the proportion of total administrative expenses of the Authority allocated to all concessions within the category (type) where concession j is classified.

TAE_c = the proportion of total administrative cost of the Authority allocated to all six concession types.

For example, assuming that

- i. authorization has been granted to five (5) Type 1 concessionaires in 2005;
- ii. the total cost estimated by the Authority to administer concessions and licences over the fiscal year 2005-2006 (year $t+1$) is six (6) million dollars of which 40% is allocated to concessions and 60% to licences;
- iii. 20% of the administrative expenses is sub- allocated to Type 1 concessionaires.

The Administrative charge per Type 1 concession, α_j

$$\alpha_j = [0.2(0.4*6\ 000\ 000)]5$$
$$= \$ 96\ 000$$

4.2 Derivation of Operating Charge

The Operating Charge relative to concession j , β_j is derived through the formula:

$$4. \beta_j = [(TR_{j,t-1}/TR_{t-1}) * TOC_{t+1}]$$

Where

$TR_{j,t-1}$ = total revenue (telecommunications and/or broadcasting) earned by the concession, j in year $t-1$

TR_{t-1} = total revenue of the telecommunications and broadcasting sector in the country in year $t-1$

TOC_{t+1} = total operating cost of the Authority budgeted for year $t+1$.

Continuing with the example above, assuming:

$$TR_{j,t-1} = \$200\ 000\ 000$$

$$TR_{t-1} = \$ 2\ 000\ 000\ 000$$

$$TOC_{t+1} = 20\ 000\ 000$$

The Operating charge liability of concessionaire j , is:

$$\beta_j = (200\ 000\ 000/2\ 000\ 000\ 000)*20\ 000\ 000$$
$$= \$ 2\ 000\ 000.$$

Therefore the concession fee due to concession j over the period 2005-2006 is:

$$\begin{aligned} CF_j &= 96\,000 + 2\,000\,000 \\ &= 2\,096\,000 \end{aligned}$$

Figure 1

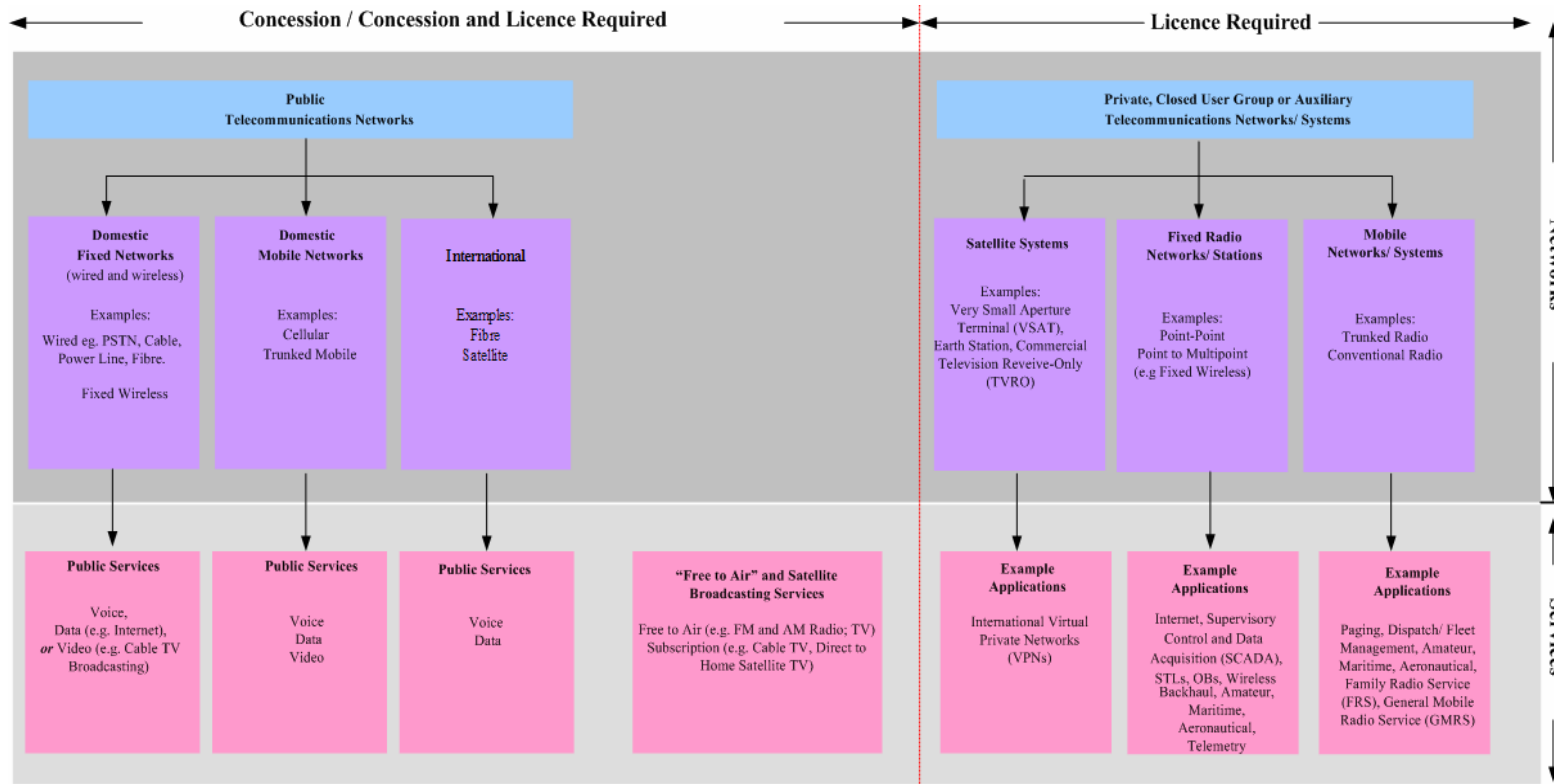


Table 3
Primary Allocation of TATT's Regulatory Expenses

Components of Regulatory Expenses	Proportion of Total Regulatory Expenses
	50.81 %
1. Concessions	
1.1. <i>Administrative Expenses</i>	24.00 %
1.2 <i>Operating Expenses</i>	26.81 %
2. Licences	49.19 %
2.1. Administrative Expenses	16.00 %
2.2. Operating Expenses	33.19 %

Predicated on projections of activity-based costs, the Authority has undertaken a thorough cost allocation exercise from which a primary allocation of administrative and operational expenses between concessions and licences has been derived (Table I).

4.3 Secondary Allocation of Administrative Expenses

Administrative expenses have been attributed to categories of concessions and licences based on expected demands that each category will place on the resources of the Authority in year t+1, where t is the current year. Each category, where applicable, was unbundled into subsets and expenses were assigned to each subset contingent on activity-based weights (Table 2).

Table 4

Administrative Expenses Allocation Matrix

Concession Category	% of Total Administrative Costs
Network Based	
<i>DMTNs</i>	14.79%
<i>DFTNs</i>	16.13%
<i>INTNs</i>	9.41%
Service Based	
<i>Telecommunications Services Only</i>	4.02%
<i>National and Major Territorial Broadcast Services Only</i>	5.46%
<i>Niche/ Minor Territorial Broadcast Services Only</i>	0.10%
Class Type Service Providers (Very Small Enterprises)	0.50%
Licence Category	% of Total Administrative Costs
Aeronautical	0.99%
Amateur and CB	0.10%
Broadcasting (National)	4.96%
Broadcasting Community	0.15%
General Radiocommunication	19.84%
Satellite	7.69%
Maritime	0.99%
Public Mobile	14.88%

5 General Formula for Regulatory Charge Re: Licences

Regulatory Charge, RCI applicable to any licence is:

$$5. \text{ RCI} = \varepsilon_1 + \rho_1$$

Where

ε_1 = the applicable Administrative Charge,

ρ_1 = the applicable Operating Charge

5.1 Formula Re Administrative Charge Per Licence

The Administrative charge per licence ε_1 is derived using the formula:

$$6. \varepsilon_1 = \text{TAE}_{1i}/N$$

Where:

N = number of licences in the sub-category at Table Y where the licence, i is classified;

TAE_{1i} = total expenses incurred by the Authority to administer all licences in the category where licence i is classified at Table Y..

$$7. \text{TAE}_{1i} = \pi_i(\text{TAE}_1)$$

Where

π_i = the proportion of total administrative expenses of the Authority allocated to all licences within the category where licence i is classified.

TAE_1 = the proportion of total administrative cost of the Authority allocated to the full matrix licences (all categories of licences) i.e. :

$$\text{TAE}_1 = (\text{TAE} - \text{TAE}_c)$$

Where:

TAE is the total administrative cost of the Authority.

TAE_c is total administrative cost allocated to all concessions.

For example, assuming that

- iv. authorization has been granted to thirty five (35) broadcast licences in 2005;
- v. the total cost estimated of the Authority to administer licences over the fiscal year 2005-2006 (year $t+1$) is six (6) million dollars of which 40% is allocated to concessions and 60% to licences;
- vi. 25% of the administrative expenses allocated to licences is sub- allocated to broadcast licences.

The Administrative charge per broadcast licence

$$\begin{aligned}\epsilon_{i \text{ broadcast}} &= [0.25(0.6*6\ 000\ 000)]35 \\ &= \$25\ 741\end{aligned}$$

5.2 Estimating Operating Charge per Licence

The Operating Charge , μ_i relative to licence i ($i = 1$ to N) is derived through the formula:

$$8. \mu_i = [(TR_{i,t-1}/TR_{t-1}) * TOC_{t+1}]$$

Where

$TR_{i,t-1}$ = total revenue earned by the licensee, i in year $t-1$

TR_{t-1} = total revenue of the telecommunications and broadcasting sector in the country in year $t-1$

TOC_{t+1} = total budgeted operating cost of the Authority in year $t+1$.

Assuming the under-listed permutations for a broadcast licensee:

$$TR_{i,t-1} = \$1\ 000\ 000$$

$$TR_{t-1} = \$2\ 000\ 000\ 000$$

$$TOC_{t+1} = 20\ 000\ 000$$

The Operating charge liability of broadcast concessionaire, i is:

$$\begin{aligned}\mu_{i \text{ broadcast}} &= (1\ 000\ 000/2\ 000\ 000\ 000) * 20\ 000\ 000 \\ &= \$10\ 000.\end{aligned}$$

Therefore the Regulatory Charge on a broadcast licence for the period 2005-2006 is:

$$RC_{li} = 25\,741 + 10\,000$$

$$= 35\,741$$

6 Spectrum Valuation & License Fees.

6.1 Definition of Spectrum

Electromagnetic radiation is the propagation (a form of oscillation) of electrical and magnetic energy which travels through space, without physical interconnection, in the form of waves including: visible spectrum (light) infrared, ultraviolet and X rays. Radio frequency spectrum (normally referred to as spectrum) is the portion of electromagnetic radiation which carries radio waves. The range of spectrum is defined by the frequencies of the transmitted signals, generally ranging from 9 KHz (approximately 1000 cycles per second) to 300 GHz (approximately one billion cycles per second). A tabulation of the range of frequencies is indicated at Table 3.

6.2 Frequency Characteristics

Frequency application and use are determined by the propagation capability in the frequency range; the higher the frequency, the lower the distance propagation capability. Generally, higher frequencies are associated with signals that have higher information carrying capacity than lower frequencies.

Invariably, where signals for particular services can be effectively transmitted by both low and high frequencies, because of economics, the lower frequencies are preferred. In the circumstances, the UHF band 300–3000 MHz which is suitable for transmission of signals for a wide variety of services is in great demand in almost all countries.

Table 5

Frequency	Band	General Use	Range	Mode
9-30 KHz	VLF	Long/ distance radio	Several 1000 km	Waveguide
30 - 300 KHz	LF	Long range radio navigation and communication.	Several 1000 km	Ground-wave Sky-wave
0.3-3MHz	MF	Medium range point-to-point broadcasting and maritime mobile	A few 1000 km	Ground-wave Sky-wave
3-30 MHz	HF	Short and long range point-to-point broadcasting, mobile.	Up to several 1000 km	Sky wave
30-300 MHz	VHF	Short& medium point-to-point mobile, LAN, broadcasting (sound & TV) personal communications.	Up to a few 100 km	Space wave , tropospheric scatter diffraction.
0.3-3GHz	UHF	Short& medium point-to-point mobile, LAN, broadcasting (sound & TV) personal communications, Satellite communications.	Less than 100 km	Space wave , tropospheric scatter diffraction, line of sight
3-30 GHz	SHF	Short& medium point-to-point mobile, LAN, broadcasting (sound & TV)personal communications, Satellite communications	Less than 30 km	Line of sight
30-300 GHz	EHF	Short range point-to-point, micro cellular, LAN, personal communications, Satellite communications, B/band Wireless	Less than 20 km	Line of sight
Above 300GHz	Not currently designated			

7 The Socio-Economics of Spectrum

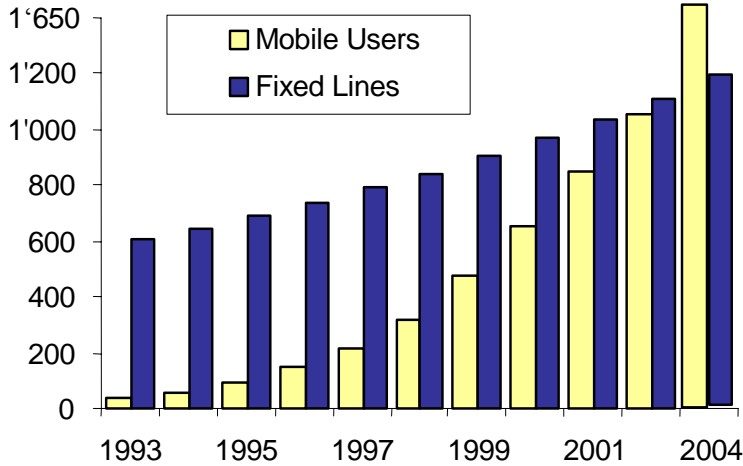
This critical natural resource which cannot be seen, touched nor smelt is the axis of the telecommunications industry which is rapidly becoming the main catalyst of global socio-economic transformation. Spectrum is a vital input for radio and television broadcasting, microwave and satellite links which facilitate various forms of voice and data communications. It is a necessary input for mobile radio, cellular services and paging services as well as communications for commercial airlines, taxis, couriers. It has also become a fundamental input for communications within construction companies, the financial sector, utility companies and oil and gas exploration. Governments depend on spectrum for communications operations of the protective services, marine safety, air traffic control and emergency and public safety services. In essence, radio frequency spectrum facilitates wireless communications that have become an important determinant of the status of human welfare by creating and sustaining opportunities in economics, finance, education, health, the leisure industries etc. Most importantly, a range of end user services via wireless technologies are now ubiquitous, affordable and financially rewarding for wireless telecommunications network and service operators. Spectrum is therefore a valuable socio-economic resource and should be treated as such.

7.1 Derived Demand for Spectrum

The change in the structure of the telecommunications market has been accompanied by a geometric upturn in world demand for spectrum for commercial purposes. The vortex of this phenomenon has been the rapid expansion in the market for mobile telephony services and attendant equipment and infrastructure. While it took fixed-line telephony between 1886 and 2001 to achieve 1 billion subscribers, the mobile industry achieved and passed that figure in just over a decade (Figure 2).

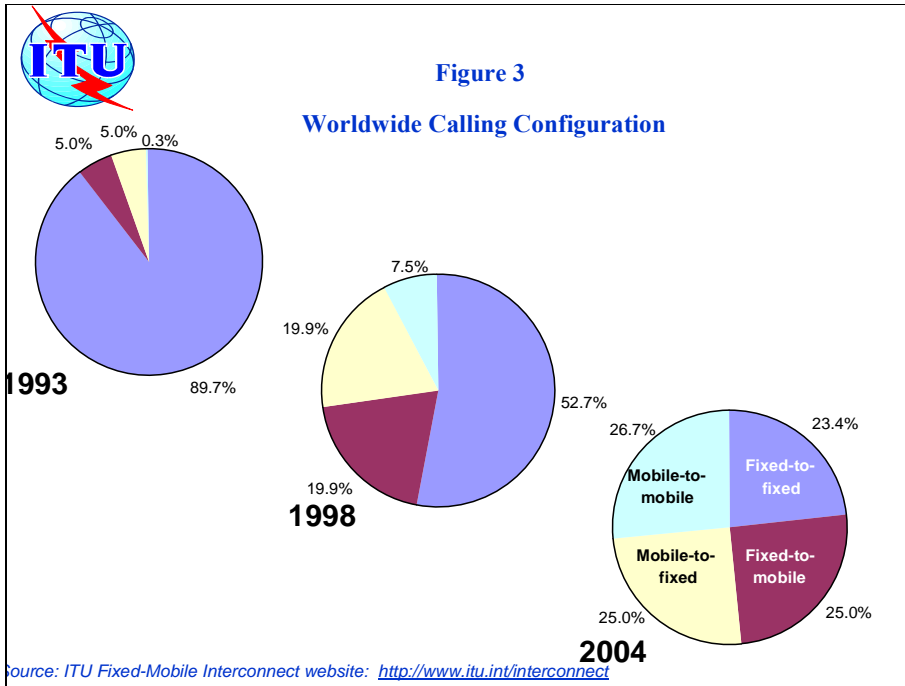
Figure 2
A Mobile Revolution

Fixed Lines vs. Mobile Users, worldwide, Million



Source: ITU World Telecommunication Indicators Database.

The dramatic shift in worldwide calling configuration is an eloquent testament of growth in auxiliary demand for spectrum. At the end of 1993, merely 10 % of total global calls involved the use of mobile handsets. By 1998, calls involving mobile handsets accounted for approximately 47% of total calls, a 37 percentage point increase over the 1993 proportion. At the end of 2003, the proportion of total calls involving the use of mobile telephones reached 77%, marking a 66 percentage point increase over the 10-year period (Figure 3). Since spectrum is the means used for transmitting signals for mobile calls, a strong positive correlation between the demand for spectrum and increasing use of mobile technologies has been evident.



7.2 Secondary Spectrum Revenue

Over the period 1991-2003 world telecommunications revenue increased substantially from approximately USD 963 billion to approximately USD 2.5 trillion, an average annual growth rate of approximately 8.4%. Despite sluggish growth rates in earnings from international and domestic voice telephony services (5.29 % and 2.82% respectively), growth in telecommunications revenue was sustained mainly by the buoyancy in returns from mobile services (29.9 %) (Tables 4 & 5).

Table 6**World Telecommunications Revenue (\$US billions)**

Year	Service & Equipment	Fixed-line (Domestic)	International	Mobile	Other
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 7**Average Annual Growth Rates, Telecommunications Industry**

Year	AGR Equipment & Services	AGR Fixed-line Domestic	AGR International	AGR Mobile	AGR Other
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
Avg	8.42	2.82	5.29	29.92	12.08

Source: TATT

The average growth rate in global revenue from mobile services including: Internet access, point-to-point and point-to-multipoint fixed terrestrial communications was significantly higher than that of other telecommunications services (Table 5). Concomitantly, demand

for spectrum to provide those services increased sharply causing exponential increments in the price of spectrum in the commercial bands. To cite few of many examples, auction of spectrum for 3G services in UK and Germany realized \$US 33.5 billion and \$US 45.8 billion respectively. Four 3G licences in Denmark were auctioned for \$US 118 million. In Jamaica the auction of two 2.5G licences earned approximately \$US 95 million.

8 Review : Derived Demand for Spectrum in T&T

The performance of the mobile market in Trinidad and Tobago has exceeded the global average. The number of mobile subscribers increased from approximately 140 000 at year end 2000 to 624 859 at the end of the first quarter in 2005, a compounded average annual growth rate of 36%. In fact, over the last few months new mobile subscribers per month have averaged 20, 000. The penetration rate which was approximately 10% in 2000, leapfrogged to 63% at the end of the first quarter in 2005, among the highest in the Caribbean. It is estimated that by mid 2006, the mobile subscriber base in the country would be approaching 850 000. More significantly, the compound average annual growth rate in earnings from mobile operations (53%) has outstripped that of the mobile subscriber base (36%). This reflects that either minutes of use have been increasing substantially or the decrease in mobile tariffs has been decisively lower than the increase in subscriber base.

In order to address the expanding mobile market, additional spectrum was granted to the incumbent operator in 2004 in the 1800 MHz band to migrate its TDMA mobile network to GSM. The Authority will only allocate additional spectrum for cellular services in the 800 and 1900 MHz bands. These bands will most certainly become more commercially sensitive for provision of cellular services in an imminent three-competitor market.

8.1 Outlook

Indications are that over the period 2006-2009, the voice telephony market in Trinidad and Tobago will be dominated by the maturing of 2.5G technology and the introduction of 3.G solutions which together are expected to surpass one (1) million subscribers. Support is likely from potentially strong growth in the purchase of handsets and services offered on those platforms. Competing mobile network operators are also expected to reap further benefits through investment in MMS and SMS services. This combination of events is likely to compress demand for spectrum both in the 800 MHz and 1900 MHz frequency bands.

The prognosis for continuum of GSM domination of the mobile market in the country through 2009 is very uncertain. Expectations are that expansion of EVDO (Evolution Data Optimised) will increase in spending on WCDMA, though slowly. This means that the 800 MHz, and 1900 MHz frequencies will be in much greater demand which will most certainly impact the value of those frequencies.

Concomitantly, the need for greater bandwidth to satisfy mass E-transactions for business, the introduction of digital radio and expansion of wireless subscriber TV services are likely to encourage network rollout using higher frequencies. Growth in demand for spectrum may also be fuelled by continued shift in the delivery of non-voice services to the higher bands, impacting positively on the values of those bands. These new developments could be accompanied by acute challenges in calculating value chains of derived demand for spectrum.

A peek into the future of a portable Trinidad and Tobago reveals an upturn in demand for spectrum to facilitate possible scenarios such as:

- Parents using mobile handsets for video contact with their children at any time of the day, even in classrooms;
- Sensors on mobile phones enabling doctors to check ailments in patients such as blood pressure, temperature and glucose levels and pulse rate, thereby reducing patient appointments; and
- Crime detection solutions using wireless technology platforms for 24-hour supervision of criminal elements in troubled communities.

Long network planning cycles and high fixed investment costs, are likely to be reduced by the introduction of wireless technologies including: (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. Those solutions together with: Free space optics, HiperLAN2, Ultra wideband (medium range) and Bluetooth, RFID, Zigbee (short range) may induce further demands on the spectrum resources in the country and intensify the

search for new formulae to estimate the market value of spectrum in order to ensure that its commercial worth is properly assessed.

9 Licence fees Methodology for a Sample of Countries

Finland

The regulator does not allocate any particular cost to any particular user. The total amount of the costs of radio administration is calculated and divided among the users. 55% of the total costs are covered by frequency fees and 40 % by license fees.

When there is an increase in the budget, the increase is shared between users (small increase in each of the fees).

Spectrum fees are calculated using the following formula:

$$9. K1 * K2 * K3 * K4 * (\text{frequency band in kHz} / 25 \text{ kHz}).$$

Whereby:

K1 = the band factor (e.g. 0-470 MHz K1 = 1 and 470-960 MHz K1 = 0.8 etc);

K2 = coverage area (for whole Finland K2 = 1; for limited area calculated proportion of 1);

K3 = starting factor (first year begins from 0.1, then increases gradually to 1 on the 6th year);

K4 = network factor, which takes into account different parameters and usage of the system including the national emergency TETRA system; and

K4 = 1 and for meteorological radiosonde system K4 = 0.1).

All factors are not used for the calculation of all systems, e.g. K4 is not used for the calculation of GSM fees.

France

There are no links between "charges and fees". An accounting system is used by the "Agence Nationale des Fréquences" to inform the Ministry of Finance how its budget is used. The "Agence Nationale des Fréquences" has an accounting system upon which it defines its budget, as indicated hereunder:

Table 6

T

	year 2002
PLANNING and INTERNATIONAL AFFAIRS activities	4,94 M€
MANAGEMENT activities	4,90 M€
MONITORING activities	14,68 M€
Work for another entity and defined by conventions	12,01 M€
OTHER activities	1,23 M€
TOTAL	37,76 M€

Spectrum fees are set on the basis of:

- bandwidth
- centre frequency
- shared use.

The fee amount is fixed with a view to promoting economic development.

Ireland

The radio administration is financed exclusively by the fees and charges. The costs of spectrum management are allocated based on the regulator's accounting system records (e.g. salary, travel, training etc). Other costs e.g. rent, insurance, depreciation are recorded centrally and allocated to activities based on the number of staff involved in those activities.

The accounting system provides details on the different costs of spectrum management.

Other factors taken into consideration when setting fees include:

- congestion pricing;
- pricing to ensure spectrum efficiency; and
- the economic value of the spectrum.

Latvia

The Latvian Telecommunication State Inspection (LTSI) works out an annual income and expenditure budget which requires approval at a shareholders' general assembly meeting.

The LTSI uses a cost accounting system predicated on the following:

- Salaries
- Social tax
- Administration expenses
- Work and services purchased
- Information technology
- Capital investments.

The value of the spectrum fee depends on the type of radiocommunication service and the purpose of spectrum use (e.g., satellite, fixed, mobile, maritime, broadcasting, amateur or aeronautic service).

The spectrum fees depend on:

- Frequency band and frequency channel bandwidth;
- Power of radio transmitter;
- Effective radiated power of radio transmitter;
- Carrying capacity of aircraft;

- Area of usage of transmitter (city, rural area).

The regulator is entitled, additionally, to collect payments for:

- issuance and supervision of individual licences;
- registration and supervision of general permits;
- administration of numbering and addresses; and
- other services provided.

Malta

The Administration in Malta does not have any cost accounting system. Fees are benchmarked to those set by other European Administrations and adjusted to reflect the local economic situation.

Malta is in the process of restructuring administrative charges and licence fees in accordance with measures set out in the new EU package.

Portugal

The regulator ANACOM does not have a cost accounting system. Fees and charges represent an approximated value of the cost of the necessary working hours, as well as the corresponding functioning costs (indirect costs).

ANACOM has introduced the step-by-step spectrum fees concept beginning with Land Mobile Service (private networks). In the near future, ANACOM intends to widen the spectrum fees concept to all radio services, namely:

- Other mobile services (private networks)
- Fixed services including:- Point-to-point links, Point-to-multipoint links
- Satellite services (earth stations)
- Broadcasting services (analogue and digital systems)
- Public mobile communications (GSM, UMTS)

The main principles of the proposed spectrum fees regime are:

- (a) bandwidth (standard channel width for a particular usage)
- (b) coverage area (geographical occupancy)
- (c) number of channels used
- (d) operating mode (simplex, semi-duplex, duplex)

Other pricing factors include:

- (a) exclusivity or sharing (exclusive occupancy or sharing of a given channel with others users)
- (b) network operator (public operator or private operator)
- (c) frequency band (congestion of frequency bands)
- (d) radio networks/system (economic potential associated with the business developed by the costumer)
- (e) location (demand for spectrum varies across the country).

New Zealand

The telecommunications legislation gives each selected licensee a “Management Right” to a frequency band empowering them to authorize other licences to utilize frequencies within the band. The fee for management right to spectrum is determined primarily by auction.

USA

The USA has divided its spectrum management functions between the Federal Communications Commission (FCC) and the National Telecommunications and Information Administration (NTIA). Their pricing policy for spectrum is to “recover for the public a portion of the value of the public spectrum made available for commercial use and encourage efficient and intensive use of electromagnetic spectrum.” Since 1994, the FCC has applied auction or competitive bidding to determine almost all licence fees for the use of commercial spectrum to provide new wireless services including:

1. ***Narrowband Personal Communications Services (PSC)*** in the (900 MHz band) including voice message paging, two-way acknowledgement paging and other data services.

2. **Broadband PCS** (1850-1990 MHz) band for mobile and portable radio services, multi-function wireless phones, portable facsimiles and advanced devices with two-way data capabilities to compete with existing cellular services.
3. **Interactive Video Data Services (IVDS)** in the (218-219 MHz) band.
4. **Specialized Mobile Radio (SMR)** in the (800 and 900 MHz) bands, a land-based mobile radio service which enables dispatch, voice and data services to commercial enterprises and specialized users and, in limited cases, to the general public.
5. **Multi-channel Multipoint Distribution Services (MMDS)**, wireless cable television in the 2150-2160 MHz and the 2596-2680 MHz bands.
6. **Direct Broadcast Satellite (DBS)** (two orbital slots) for space stations to transmit and retransmit signals to facilitate direct TV reception.
7. **Satellite Digital Audio Radio Service (DARS)** in the 2320-2345 MHz band for transmission of high-quality audio signals to subscribers via satellite
8. **Wireless Communications Services (WCS)** a radio communication service for a variety of fixed, mobile, radiolocation and broadcasting satellite sound services located in the 2305-2320 MHz and 2345-2360 MHz bands

Australia

The Spectrum Management Authority (SMA) has applied auction and property rights, based on economic rent, as the main instruments to determine spectrum/license fees. Licence fees are calculated on the basis of:

- i. Cost of issuance or renewal;
- ii. Cost of spectrum management; and
- iii. A spectrum access tax for the use of a national resource, as determined by factors such as spectrum location, geographic location, channel bandwidth and coverage area.

UK

The UK has employed a combination of auction and opportunity cost pricing to determine licence fees for the following services:

1. *Public mobile telecoms*: The auction in early 2000 of five licences for Third Generation mobile telecommunications services set the framework for the future of licence fees for mobile telephony in the UK. It has been recommended that new licences for commercial services be assigned by auction, with trading rights and maximum flexibility attached to spectrum use.
2. *Private mobile radio*: with over 55,000 licensees across the UK, including a large number of emergency services and other public safety operators, Ofcom is moving to assign spectrum via auction to a number of competing national band managers for a range of private mobile radio bands. Among the objectives is encouragement of innovative use of congested frequencies. This approach will ultimately be extended across the majority of private mobile radio spectrum.
3. *Fixed terrestrial services*: auctions are used for individual assignments of fixed terrestrial point-to-point links and for uplink transmissions by fixed satellite earth stations within the same bands. Exclusive geographical area licences for fixed wireless access for regional 28 GHz licences for broadband services are also auctioned.
4. *Satellite services*: In order to plan and coordinate effectively spectrum access rights and responsibilities of satellite systems operating in the UK, licence fees are based on the opportunity cost of the spectrum satellite users occupy. Mobile and interactive satellite terminals present the most difficult spectrum management challenges in sharing bands with terrestrial systems. To the extent that satellite systems constrain the deployment of fixed terrestrial systems, such as communication links and wireless access, operating in the same bands, Ofcom applies a spectrum fee on satellite system operators based on the opportunity cost of the spectrum.
5. *Broadcasting*: The Government's strategic broadcasting goal is that public service broadcasts should be available to everyone. Increase in demand for

spectrum which can be used flexibly to deliver broadcast services has caused Ofcom to base licence fees for spectrum allocated to broadcast on opportunity cost.

6. *Aeronautical and maritime*: Marine and aeronautical radars occupy some 30 per cent of the spectrum in the 1-3 GHz range. Given the global mobility of on-board communications and radar equipment, OFCOM is seeking to introduce greater spectrum efficiency in that band through the application of administrative pricing. The contention is that the application of administratively set spectrum prices would assist in delivering the best utilization of spectrum reserved for aeronautical and maritime uses.

Canada

Industry Canada has been engaged for some time in overhauling its license fee structure to ensure equity among users and that the economic rent of the resource is captured. The new model proposes to price spectrum usage on geographic coverage, exclusive use and bandwidth. Larger bandwidths, greater geographic coverage and exclusive use will generate higher license fees. A grid/cell pattern has been mapped across the country. The ratio: volume of spectrum consumed in each grid/total volume of spectrum in a specific band determines the licence fees for spectrum in the band.

China

Like most countries, China has been moving away from the old system of basing licence fees on a percentage of revenue. The Radio Regulatory Department has recast its licence fees structure using the following variables:

- i. Bandwidth used;
- ii. The area covered i.e. city or province; and
- iii. Frequency.

For the same service, different fees are charged depending on the frequency used. As a case in point, fees per MHz for a microwave station operating above 10 GHz are half that for stations operating below 10 GHz bands.

Germany

Pursuant to the Frequency Fee Ordinance, licence fees are determined by the product of the frequency assignment fee and the number of transmitters. The frequency assignment fee is a contribution towards the cost of spectrum management activities including planning and updating frequency usage, measurement, testing and compatibility studies to ensure interference-free frequency management.

As an example, where a satellite network consists of 1 hub station and 20 Very Small Aperture Terminals (VSATs) with each VSAT using 1 frequency which is subject to coordination, the formula for the license fee, μ is:

$$\mu = \text{frequency assignment fee} \times 21$$

Israel

Licence fees are determined by the Ministry of Communications of the State of Israel on the basis of the following:

- i. Annual spectrum usage charge;
- ii. A percentage of income for the right to provide the service, and
- iii. One-off payment by the winner in case of an auction.

Spectrum usage charges are based on the economic rent of the frequency band. The fees for frequencies above the 960 MHz band are lower than fees for frequencies in the lower bands. Below 960 MHz the average annual spectrum charge is US\$ 170 000 per 1 MHz.

Kyrgyz Republic

The Kyrgyz Republic models spectrum licence fees using the following variables:

- (a) Annual cost of spectrum management;
- (b) The size of bandwidth and propagation characteristics of the frequency band used;
- (c) Area covered and population density of the Covered area; and
- (d) Social factors.

Russia

In Russia, only operators providing the following services are required to pay license fees:

1. Mobile telephony
2. Cellular telephony
3. Radio paging
4. Radio paging with VHF FM channel multiplexing
5. Distribution of TV programmes using MMDS, LMDS and MVDS systems.

License fee per service is calculated on the basis of:

- i. Service area;
- ii. Number of channels used; and
- iii. The bandwidth used.

Jamaica

Jamaica has been reforming its spectrum pricing regime away from the old method of licence fees based on proportion of revenue, to one based on the market value per MHz of spectrum.

OECS Countries

Like the Spectrum Management Authority (SMA) in Jamaica, ECTEL is finalising the review of its spectrum licence fees to provide for charges per MHz of spectrum assigned, instead of revenue proportion charges.

10 Methodology: Spectrum User Charge, Trinidad and Tobago

There are approximately 1548 bona fide licensees (not including special licences) of which some 962 operate radiotelephone, 559 are amateur operators and 27 are unclassified. Radiotelephone licences include point-to-point, point-to-multipoint, mobile, aeronautical, maritime and VSAT.

Some 33 special licences have been granted for free to air FM broadcast and 7 special licences for free to air television broadcast. One special licence has been granted to a subscription-based satellite TV operator.

In terms of use of spectrum, public mobile services (cellular) are assigned the following bands: 825-845MHz, 870-890MHz, 1880-1910MHz and 1930-1960MHz. Private land mobile operators (trunk radio etc) use the 138-144MHz, 148-156MHz, 158-174MHz, 400-470MHz and 846-869MHz spectrum bands. Private maritime services (large and small vessels) use the 156MHz and sub-30MHz frequencies. Satellite services (earth stations and VSAT) are restricted to the 4GHz, 6GHz, 11.9GHz and 12.2GHz frequencies. The details of frequency use for broadcasting are the following: FM broadcasting, 88-108MHz, AM Broadcasting, 610KHz-730KHz, television broadcasting, 55-88MHz, 174-216MHz and 470-806MHz. Fixed terrestrial services (FM/TV STLs, point to point etc) are assigned to the 225-267MHz, 440-460MHz, 890-913MHz, 930-960MHz, 1.7-2.2GHz, 6.5-7.2GHz and 1.429GHz spectrum bands. Most Licence fees for use of spectrum have been equivalent to 2% of the gross revenue of the licensee.

Table 8
Spectrum Classification & Valuation Principles

Spectrum Grade	Grading Criteria	Scarcity Determination Factor	Use Likelihood	Spectrum User Charge Principle
Grade 1	Scarce	Demand > Available Spectrum	Mainly Public Telecommunications or Broadcasting Services.	Derivation of economic rent or opportunity cost of band used.
Grade 2	Demand Sensitive	Demand \approx Available Spectrum	Public Telecommunications or Broadcasting Services. Closed User Group Services.	Proxy of market value of the band based on proportion of value of Grade 1 spectrum, potential earnings and demand with adjustments for efficiency.
Grade 3	Non-scarce	Demand < Available Spectrum	Personal, Safety-of-Life, Public Health and Safety (non-commercial private radiocommunication service).	No spectrum usage charge.
Grade 4	Reserved	Reserved	National Security purposes.	No spectrum usage charge.

The diagram in Appendix I illustrates the above spectrum classifications as it pertains to the frequency spectrum bands that are currently assigned for use. The Spectrum Usage Charges for frequencies used mainly for commercial purposes are contingent on the economic value of the spectrum and the purpose for which, and manner in which the spectrum is used. These factors may vary depending on the peculiarities of frequency bands. As shown at the table above, Grade 1 spectrum is likely to yield the highest economic rent because of scarcity. Grade 2 spectrum, though not scarce, has a marginal utility greater than zero when used for commercial purposes. Grade 3 spectrum has an estimated marginal utility of the asymptote of zero. Grade 4 spectrum is reserved for

specific national obligations including, but not exclusive to, national security activities, national health and safety and national emergency services and is assigned a commercial value of zero. A detailed spectrum classification Table is at Appendix I.

10.1 Spectrum User Charge (Grade 1 Spectrum)

All user charges applicable to Grade 1 spectrum will be determined by auction. Auctions take various forms, including:

1. **English Auction:** the auctioneer increases the price until a single bidder is left.
2. **First-price Sealed-bid Auction:** involves submission of sealed bids of which the highest bidders win.
3. **Second-priced Sealed-bid Auction:** bidders submit sealed bids, the highest bidder is selected but pays the bid price of the second highest bidder.
4. **Dutch Auction:** the auctioneer starts at a very high price which is reduced until a bidder shouts “mine”.
5. **Simultaneous Multiple-round Auction:** involves multiple rounds of bidding for a number of blocks of spectrum that are offered simultaneously. The highest bid on each lot is revealed to all bidders before the next round when bids are again accepted on all blocks. The identity of the highest bidder may or may not be revealed after each round but is revealed at the close of the auction. The process continues until a round occurs where no more bids are submitted on any block.

Auction is the main spectrum pricing or assignment mechanism in cases where demand for a particular block of spectrum exceeds supply. An auction awards use of specific blocks of spectrum to the highest bidder/s. This is construed as equivalent to the highest market value or the economic rent of the spectrum.

The result of an auction is also an efficient indicator of the opportunity cost of a resource. Opportunity cost is the second best differential utility of a resource as determined by the

next most efficient user. Since the value of spectrum must be managed and determined in a manner that ensures efficient utilization of the resource, methodologies that capture economic rent and/or opportunity cost serve as useful tools in setting spectrum usage charges in over subscribed bands. Like all natural resources, e.g. oil, auction is a manifest of optimal commercial exploitation of spectrum in that:

- (a) a well designed auction identifies the users with the highest marginal utility of the resource and who are likely to generate highest economic benefits;
- (b) it is a transparent and fair system of allocation since the market sets the price of the spectrum;
- (c) it is fair to new market entrants whenever the license fee of the old entrants for using the same resource is adjusted in accordance with that derived via auction.

Spectrum pricing through auction is now a well established practice among many national regulatory authorities. But this process has not been without pitfalls. The recent travails of the telecoms sector, which followed auctions of 3G licences in a number of countries, including the UK and other EU countries, have led some commentators to suggest that setting spectrum fees by auctions has had significant side effects including higher end user prices and delay in deployment of services.

These arguments were considered in a recent report of the UK based National Audit Office (NAO) which concluded that it was not evident: “that the costs of the licences have been increasing the retail prices of wireless services consequent upon spectrum charges through auction”. The report further concluded that prices of such services, except in monopoly situations, are contingent on market conditions as opposed to simply passing on costs. The NAO report suggested that the core of the issue is the differential in license fees. Incumbent mobile operators were assigned spectrum at negligible fees prior to market liberalization while new entrants have been made to pay much higher spectrum fees through auctions. It was recommended that this problem should be addressed by requiring all mobile operators to pay spectrum fees comparable to that paid by new entrants in order to create equity in rates of return on investments of the incumbent and new entrants.

Like most countries that use variants of auction processes to determine the market value of blocks of spectrum that are subject to scarcity and/or differential use, the Authority

proposes that where spectrum bands attract more qualified applicants than available spectrum, Spectrum Usage Charges will be determined by auction. The final price set by such auction shall be applicable over a prescribed period. Pre-auction price per MHz of spectrum in bands identified for auction shall be adjusted by the Authority in accordance with the fee structure established via auction of such bands

10.2 General Formula Re: Licence fees for Grade 1 Spectrum

In year one of an auction, the liability of the *winning bidder* is twenty-five (25) percent of the value of the *winning bid*. The Licence fee applicable thereafter to Grade 1 spectrum, LF_{1s} is derived by the formula:

$$9. LF_{1s} = RC_{li} + \frac{0.75 AF(1 + i)^{n-1}}{n-1}$$

Where:

RC_{li} = the Regulatory charge applicable to the licence;

AF = the full value the winning bid realised by the auction;

n = the period over which the licence has been granted; and

i is a rate of interest agreed between the Authority and the winning bidder to facilitate instalment payments on winning bid.

10.3 Spectrum Usage Charge (Grade 2 Spectrum)

Grade 2 Spectrum is defined as that not having premium market value as determined by effective demand and commercial value. Since demand for all Grade 2 spectrum is not the same, pricing cannot be based on a mechanism of equivalence. Neither is there a set economic science in establishing the matrix of market values that attend the different frequency bands identified in this category. In the circumstances, the Authority proposes to use percentages of the established average reserve price of Grade 1 spectrum as benchmarks for basic economic values of the relevant frequency bands. The percentages are based on proximity of frequency to Grade 1 spectrum, the level of demand and/or commercial returns associated with the different spectrum bands. User Charges for Grade 2 spectrum will be adjusted for efficient usage of the resource.

The parent formula for Spectrum Usage Charge per MHz pair , S_{uc} , for Grade 2 spectrum is therefore:

$$10. S_{ucj} = K_{smj} (A_{smj})$$

Where:

K_{smj} is a percentage of the weighted average of reserve prices (per MHz pair) of auctioned bands applicable to the spectrum in band used by licensee j ;

$$A_{smj} = f(\sum_{i=1}^5 F_i)$$

The vector, F_i comprises the following variables:

- $F_1 = \frac{1}{\alpha}$
where
 α = number of re-assignments made by the Authority for the same spectrum
- F_2 = value sensitivity coefficient based on the location of use for access spectrum (niche =0.5; otherwise=1)
- F_3 = percentage by which radial distance is < maximum technical specifications as set out by the Authority.
- F_4 = percentage by which EIRP is < maximum technical specifications as set out by the Authority.
- F_5 = percentage by which beam-width is < maximum technical specifications as set out by the Authority.

***Note:** F_3 , F_4 and F_5 are meant to be incentives (discount factors) for licensees to adhere to the technical specifications set out by the Authority for different systems and bands. These factors will be applied by the Authority based on the degree of adherence to the technical specifications in the relevant spectrum plans. Until such time as the Authority prescribes the technical specifications in the relevant spectrum plans, the value of F_3 , F_4 and F_5 will be equal to 1.*

10.4 Licence fees for Grade 2 Spectrum

A License Fee for Grade 2 Spectrum LF_{2s} is therefore:

$$\begin{aligned} 11. LF_{2s} &= RC_{lk} + S_{uej} \\ &= RC_{lk} + K_{smj} (A_{smj}) \\ &= RC_{lk} + K_{smj} (\sum_{i=1}^6 F_i) \end{aligned}$$

Where:

RC_{lk} is sum of the Administrative and Operating Charges (the Regulatory Charge) applicable to the licence .

10.5 Licence fees for Grade 3 Spectrum

A License Fee for Grade 3 Spectrum is the equivalent of the Regulatory Charge applicable to the licence.

10.6 Licence fees for Grade 4 Spectrum

A License Fee for Grade 4 Spectrum is the equivalent of the Regulatory Charge applicable to the licence, a cost which may be borne by the Authority.

Appendix 1

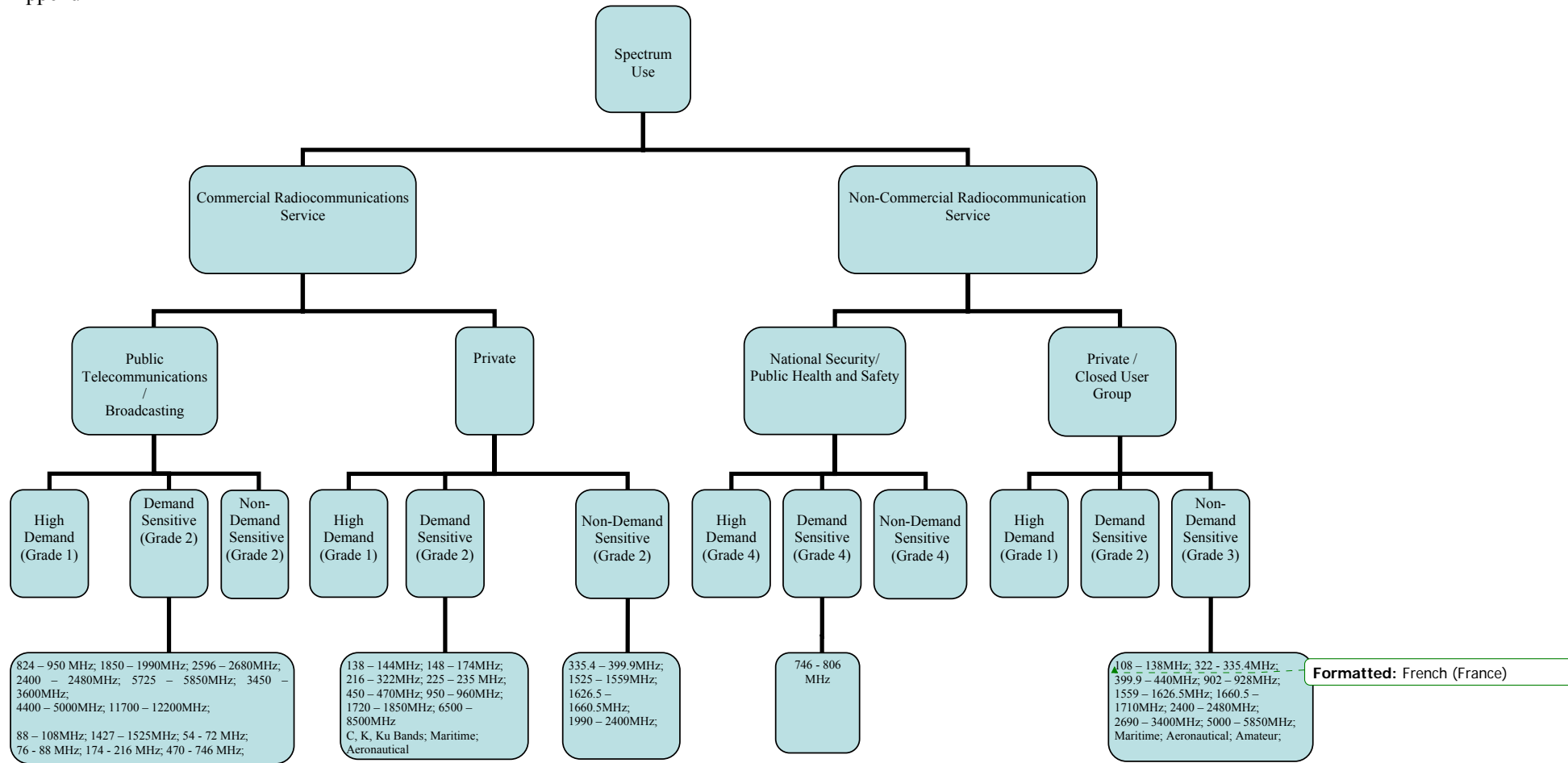


Figure 1: Classification of Spectrum

11 Definitions

Commercial Radiocommunication Service means a wireless telecommunications or broadcasting service provided to the general public or to private entities for purposes of direct or indirect economic gain.

Non-commercial Radiocommunication Service means a wireless telecommunications or broadcasting service provided to the general public or to private entities without intent or realization of direct or indirect pecuniary gain.

High-Demand Sensitive Frequency Band means a frequency band which is scarce or is in high demand for either public or private use on an exclusive or limited basis.

Demand Sensitive Frequency Band means a frequency band which is not scarce, but is used for either public or private use on an exclusive or limited basis.

Low-Demand Sensitive Frequency Band means a frequency band which is either not in high demand for exclusive use, or is used on a shared basis.



Telecommunications Authority of Trinidad and Tobago

DECISIONS ON RECOMMENDATIONS

Document Name: Proposed Fee Structure for Concessions and Licences

Document Sub-Section	Submission Made By: Stakeholder Category ¹	Comments Received	Recommendations Made	TATT's Decisions
General				
	The Association of Independent Internet Service Providers TSTT Illuminat Caribel Omega Telecom DIRECTV Trinidad Trinidad and Tobago Publishers and Broadcasters Association	<p>We feel compelled to write to you at this time given the initial feedback from the Telecommunications Authority of Trinidad and Tobago (TATT) to some of these stakeholders refusing an extension of today's deadline for the submission of comments on the Draft Telecommunications Fee Regulations.</p> <p>These regulations were circulated on 18th July, seeking a response within twelve working days. The stakeholders all agree that this is not only unreasonable, but an unrealistic expectation for getting a thorough response.</p>		<p>The Authority consulted with the relevant stakeholders prior to producing the relevant documents for consultation.</p> <p>However, the Authority agrees to a meeting with stakeholders to discuss the concerns arising from the consultation of the documents.</p> <p>The Authority is of the view however, that in the case of spectrum, it is an input and like all inputs there should be a charge reflective of economic value.</p>

¹ Regional regulatory or Governmental agencies, Existing service and/ or network provider and affiliates, Potential service and/ or network providers and affiliates, Service/ Network Provider Associations/ Clubs/ Groups, General Public

Document Sub-Section	Submission Made By: Stakeholder Category¹	Comments Received	Recommendations Made	TATT's Decisions
		<p>Evenso, these many stakeholders have had an opportunity to review the document and are gravely concerned by the impact the proposed Licence Fees can have on small, medium and large businesses.</p> <p>Using the proposed rates, in the case of some small businesses, current Licence Fees will increase from \$400 per year to \$8,400 per year. In another category of medium business, the proposed licence fee will increase from \$5,000 to \$1.2 million per year, while at least one of the large businesses will face potential increased licence fees in excess of \$50 million.</p>		

Document Sub-Section	Submission Made By: Stakeholder Category¹	Comments Received	Recommendations Made	TATT's Decisions
		<p>In our view, these rates while appearing to have a serious disconnect with reality, will result in the closure of many businesses in the telecommunications sector including the loss of jobs and a negative impact on the consumer.</p> <p>At the same time, in our estimation, the revenue generated from this Fee Structure will far exceed that required to operate the TATT, which some of the stakeholders believe run counter to the provisions of the Telecommunications Act.</p> <p>We believe that these fees also contradict the Government's philosophy on telecommunications and the desire to develop this sector. In this regard we are concerned about the number of Policy Documents emanating from the</p>		

Document Sub-Section	Submission Made By: Stakeholder Category¹	Comments Received	Recommendations Made	TATT's Decisions
		<p>TATT, without an apparent overarching Government Policy. In most of these cases the documents are developed without any prior consultation with the stakeholders.</p> <p>We can only surmise that this approach and such short deadlines for responses are a result of the enormous amount of work expected from the TATT in a very short space of time. Faced with this we request that consideration be given to extending the response time.</p> <p>We also ask for a meeting in which we might be able to discuss our concerns further and get a greater understanding in terms of the Government policy and philosophy on the telecommunications sector.</p>		
	Potential service and/ or facility providers and affiliates (Antilles Crossing)	Antilles Crossing concurs with the principles of recovery of the administrative costs of regulation and allocates such costs on an		Noted.

Document Sub-Section	Submission Made By: Stakeholder Category¹	Comments Received	Recommendations Made	TATT's Decisions
		equitable basis amongst all licencees and user groups.		
	Existing service and/ or facility providers and affiliates (CCTT)	<p>First, any new fee structure ought to be all-encompassing. This means that it should repeal and replace any existing telecommunications regulatory fees and charges that have been levied under previous regulatory regimes in Trinidad and Tobago. This should take place with the enactment of the new fee structure, so that all regulated entities are placed on a level playing field in terms of their financial obligations to the TATT.</p> <p>Second, any new fee structure should be calculated in an open and transparent manner and should be applied to all regulated entities in a non-discriminatory manner. Subject to some specific comments below, Trans-Cable is of the view that the Fee Document adopts this approach.</p> <p>Third, any new fee structure ought to be limited in its scope to the recovery of expenses and charges</p>		<p>Noted, however, the commitment to settle outstanding fees from the prior regime will remain.</p> <p>The revised charges for concessions do not involve the use of spectrum and are consistent with Section 52 of the Act.</p> <p>Noted.</p> <p>The Authority has considered all the elements of fee recovery to recover its Regulatory Costs (in addition</p>

Document Sub-Section	Submission Made By: Stakeholder Category¹	Comments Received	Recommendations Made	TATT's Decisions
		<p>associated with the exercise of the functions, powers and duties of the regulatory body. Fees should be estimated on an annual basis with this principle in mind and should be adjusted annually to maintain this principle. The fee structure ought not to be a profit generating system for the government. Successful concessionaires and licensees will generate employment for the country's citizens. Both concessionaires/licensees and the citizens that they employ will also pay taxes. In addition, to the extent that any fee structure imposes additional charges on concessionaires, those costs will ultimately be reflected in higher than necessary rates to customers. This may ironically reduce the ability of these systems to market their services and impair the laudable policy goals set out in the <i>Telecommunications Act, 2001</i> (the "Act") and specifically subsections 3 (c) (i), (ii), (iv), (d) and (f) which read as follows:</p> <p>"The objects of the Act are to</p>		<p>to contingency) over the review period of the fee structure, and has therefore spread this cost among all the parameters in the fee formulae. The Authority is of the view that this approach has introduced an element of differential charging for different sizes of providers.</p>

Document Sub-Section	Submission Made By: Stakeholder Category¹	Comments Received	Recommendations Made	TATT's Decisions
		<p>establish conditions for—</p> <p>(c) promoting and protecting the interests of the public by—</p> <p>(i) promoting access to telecommunications services;</p> <p>(ii) ensuring that services are provided to persons able to meet the financial and technical obligations in relation to those services;</p> <p>(iv) promoting the interests of customers, purchasers and other users in respect of the quality and variety of telecommunications services and equipment supplied;</p> <p>(d) promoting universal access to telecommunications services for all persons in Trinidad and Tobago, to the extent that is reasonably practicable to provide such access;</p> <p>(f) promoting the telecommunications industry in Trinidad and Tobago by encouraging investment in, and the use of, infrastructure to provide telecommunications services...”</p>		

Document Sub-Section	Submission Made By: Stakeholder Category¹	Comments Received	Recommendations Made	TATT's Decisions
		<p>It appears to Trans-Cable that the Fees Document does not adopt this approach, since the proposed quasi-royalty charges, discussed below, are proposed to be levied in addition to the costs of the TATT and that they will ultimately form part of the government's Consolidated Fund. As telecommunications is, by its very nature, an international business, and the TATT undoubtedly wishes to promote world class services being offered, it is important to create a regulatory environment (and fee regime) that is compatible and competitive with other international markets where operators' capital could be deployed as an alternative.</p> <p>Fourth, any new fee structure should be easy for the regulator to administer and amounts owing should be predictable and easy to calculate. It appears to Trans-Cable that the Fees Document does not achieve this principle, for the reasons set out below. Trans-Cable</p>		<p>The royalty charge has been exempted from the revised document.</p> <p>The Authority does not agree with this view. The Regulatory charge is a fixed fee per authorization category. However, the Authority has provided greater clarity in the document on the formulae and the information</p>

Document Sub-Section	Submission Made By: Stakeholder Category¹	Comments Received	Recommendations Made	TATT's Decisions
		<p>urges the TATT to consider a much simpler method of fee calculation that still meets the principles of openness/transparency and non-discriminatory application.</p> <p>Fifth, in an era of increasing convergence of traditional telecommunications and broadcasting sectors, the new fee structure ought to avoid any double charging and should clearly set out what authorisations the relevant fee includes. In this regard, Trans-Cable strongly supports clear definitions of terms to be used in the new fee structure.</p> <p>By way of specific example, as the TATT is aware, Columbus Communications Trinidad Limited (“CCTL”), which has proposed to acquire the business of Trans-Cable, has filed an application for a facilities-based cable television operation to serve Trinidad. The filing was made prior to the release of the Consultative Document entitled <i>Draft Policy on the Authorisation of</i></p>		<p>that would be required for the calculation of the fees.</p> <p>The Authority has provided clarity in its authorization as to the applicability of the service neutral concession for telecommunications and broadcasting services. Service neutrality on any network extends to the flexibility in the provision of telecommunications services. Therefore an additional authorization and hence an additional charge is required to provide a broadcasting service. However, the Authority will take into consideration the possibility of providing a broadcasting service over a telecommunications network when prescribing the relevant fees.</p>

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		<p><i>Telecommunications Networks and Services and Broadcasting Services in Trinidad and Tobago, June 14, 2005 (the "Draft Authorisation Policy") and as such, did not use the terminology subsequently adopted in the Draft Authorisation Policy. Trans-Cable understands that there are a number of other applications for cable television authorisations that have been filed and that may be in the same situation as CCTL. It now appears that these applications (CCTL's in any event) are for what the Fees Document refers to as a public telecommunications network and more specifically a "Domestic Fixed Telecommunications Networks (DFTN) including: PSTN, Cable, power line, fibre, fixed wireless, etc."</i>²</p> <p>What is not clear from the Fees Document is whether such concessions, if granted, would also include a requirement to pay a fee for a concession to provide "broadcasting services", since that</p>		

² Fees Document, page 8.

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		<p>term includes “subscription television services” a term which is undefined in the Fees Document. CCTL is clearly seeking to operate a facilities-based cable television network, but its packages will be subscription-based. It is Trans-Cable’s respectful submission that any concession fee for a DFTN should include all fees for providing any facilities and/or services under that concession; this would include all programming services normally associated with modern cable television services, e.g. free-to-air television and radio, non-broadcast television and radio³, pay television and pay-per-view television (all using the most appropriate transmission facility as selected by the provider and whether in digital or analogue format), a cable-originated ‘community channel’, Internet access/retail service and telecommunications services. Accordingly, Trans-Cable specifically asks that the TATT clarify in any Fees Regulations that</p>		

³ Sometimes referred to as ‘cable channels’ or ‘specialty channels’.

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		<p>this understanding is correct.</p> <p>Clarity in this regard is in the public interest. With modern technologies available to provide various broadcasting and telecommunications services, concessionaires should be encouraged by the TATT to offer customers the widest range of services at the lowest prices. They should be encouraged to capture the synergies and lower costs available to them from using one transmission platform to offer a variety of different services. They should not be artificially constrained in providing services by having to pay additional fees that might discourage them from fully utilizing such facilities.</p>		
Section 1				
Objective Function	Existing service and/ or facility providers and affiliates (TSTT)	This document elucidates that the proposed fee structure relating to concession is predicated in the main on Section 3 of the Telecommunications Act, 2001. However, it must be noted that	TSTT recommends that Concession fees be imposed within the substantive of Section 52 of the Act, and should only recover the associated related costs.	The fee provisions are clearly articulated in Sections 41 and 52 of the Act. They both need to be read in conjunction with the other.

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		<p>Section 3 of the Act specifically established the overarching framework of government's telecommunications and broadcasting policy. Application of this framework to concessions/licences fees can impact negatively upon:</p> <ol style="list-style-type: none"> 1. The financial viability of the operators and service providers; 2. The level of investment in infrastructure and network rollout; and 3. Affordability of services to end-users, especially where fee may be a significant part of operators and service providers' operating costs. <p>Additionally, TSTT notes that fees for concession are to be charged in accordance with the Section 52 of the Act, which states that, except with regards to licensing frequency bands</p>		

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		under Section 41, concession and licence fees charged by the Authority shall be commensurate with the cost of providing its services, operating the Authority and administering concessions or licences, and charged to concessionaires and licensees on a just and reasonable basis.		
Objective Function	Existing service and/ or facility providers and affiliates (TSTT)	TSTT agrees with the Authority that any fee structure implemented by the Authority will impact directly upon the ability of network operators and service providers to Invest, make access ubiquitous and affordable to the citizenry of Trinidad and Tobago. However, TSTT draws to the Authority's attention Section 52 of the Act which authorizes the Authority to charge fees to cover the cost of regulations and not the market value of provisioning telecommunications. TSTT recognizes that concept of	TSTT recommends that the substantive of Section 52 (Concession and licence fees) and 41 (fees for licensing frequency bands) be applied. Further, to avoid ambiguity, this part of the consultative document should be redrafted to separate the Act's dichotomy between concession and licence fees.	The Authority agrees with this recommendation and has re-drafted the document accordingly.

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		market values is applicable for licensing frequency bands; yet this area of the Section 1 addresses both concessions and spectrum. This therefore creates some ambiguity that requires clarity.		
1.1	Existing service and/ or facility providers and affiliates (TSTT)	TSTT draws to the Authority's attention that dispute resolution has a particular connotation under the Act to which the Authority is not a party. However, TSTT duly notes that the Authority has the right to resolve consumer complaints.	TSTT suggest that the word dispute be replaced with " <i>complaint</i> "	The Authority disagrees with TSTT's interpretation of Section 82 (2) with regard to the meaning of 'party'.
1.1	Existing service and/ or facility providers and affiliates (CCTT)	Trans-Cable supports the concept of an administrative fee, as contemplated in section 1.1 of the Fees Document. More specifically, Trans-Cable agrees that the overall administrative costs of regulation should be borne by the entities that it regulates and further that such costs should be collected from regulated entities in an open and transparent manner, based on a formula that is applicable in a non-discriminatory fashion to all regulated entities.		Noted.

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1.1	Existing service and/ or facility providers and affiliates (CCTT)	<p>The Fees Document proposes that the concession fee will be comprised of the above administrative fee and a “quasi-royalty charge” which is described as being for the right to supply the public a commercial resource and which is “based on the economic value of the concession which may be adjusted to give consideration to socio-economic and cultural factors”.⁴</p> <p>For the general reasons noted above, Trans-Cable strongly opposes this proposed charge. However, more specifically, Trans-Cable opposes any regulatory charge that is based on the notion of “the economic value of the concession”, since that requires a calculation of economic value of the enterprise. Economists themselves can hold legitimately differing views on how this calculation should be effected. In addition, this approach suggests that the calculation might be made more than once with respect to any</p>		<p>The quasi-royalty charged has been removed from the revised document.</p> <p>The Authority notes the comments of CCTT, however we are of the view that the methodology is the most fair approach to encouraging investment by all industry players regardless of size.</p> <p>The Authority has also provided greater clarity with regard to the formulae outlined in the document.</p>

⁴ Fees Document, page 7.

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		<p>given enterprise. Such an approach will cause considerable uncertainty and will have direct repercussions in any attempt by such entities to raise capital in the financial markets.</p> <p>This approach has the potential to punish the most successful concessionaires, who through their own efforts and entrepreneurial abilities are able to increase the economic value (however defined) of their operations and who as a result are required to pay higher quasi-royalty charges. It would be quite ironic and undesirable if this result did in fact occur, while the less successful concessionaries were shielded from such increases by virtue of their lack of success!</p> <p>This uncertainty is only compounded by the suggestion that the calculation may also be adjusted by undefined socio-economic and cultural factors. Since the Fees Document does not elaborate on what these factors might entail, Trans-Cable is not in a position to comment on them,</p>		

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		<p>other than to state that they appear to be completely subjective in nature and it is highly unlikely that they will be applied in an open and transparent manner or that they will be applied in a non-discriminatory fashion to all concessionaires. Such an outcome would not be in the public interest or contribute to the achievement of any of the objects of the Act.</p> <p>In addition to its opposition to the proposed quasi-royalty charge generally, Trans-Cable submits that the charge as set out is very difficult to calculate and will not be easy for the TATT to administer. The quasi-royalty charge is based on a portion of a concessionaire's annual net cash flow. However, this calculation requires the use of seven separate equations that cover three pages of the Fees Document. Trans-Cable submits that this is unnecessarily complex.</p>		
1.4	Existing service and/ or facility providers and affiliates (TSTT)	TSTT agrees with the Authority that fees should be comprised of an administrative charge. This in TSTT opinion is in keeping with	TSTT strongly recommends that quasi-royalty charges be omitted, as it constitutes a tax.	Noted. The Authority regulatory charges are now compliant with Section 51 and 52 of the Act.

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		<p>Section 52 of the Telecommunications Act. However, in TSTT's opinion this said section does not allow TSTT to impose a tax (progressive or otherwise) upon any concessionaire or licensee in terms of its revenues or net free cash flow. TSTT opines that there are no linkages between Section 52 of the Act and subsection (b) of Section 4.1. Further, TSTT strongly believes that the imposition of a quasi-royalty fee would impose a heavy financial burden upon operators such that network built out and investment are impinged upon.</p>	<p>As an alternative TSTT recommends that the Authority apportion its approved budget, similar to the cess contained in Section 30 of the RIC Act (No, 26 of 1998) on concessionaries. Furthermore, TSTT strongly recommends that Concession fees should be equally distributed among equally situated concessionaires.</p>	
Section 5				
5	Potential service and/ or facility providers and affiliates (Antilles Crossing)	<p>Antilles Crossing has concerns about the definition of Net Free Cash Flow (NFCF) used in the equation.</p> <p>(a) TOR or the total operating revenue of the operator should be readily quantifiable but there should be proper benchmarks put in</p>	<p>Based upon the 32-years experience of the undersigned in regulated industry cost of capital proceedings, it is Antilles Crossing's belief that the use of any CPEX or WACC mechanism is extremely difficult to administer an audit and its use should be avoided.</p>	<p>Based on the revised version of the document the comment is now longer applicable.</p>

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		<p>place to ensure that all carriers are accounting for outpayments (carrier settlements) on a comparable basis and to ensure that there is no double counting of revenues.</p> <p>(b) TAC or the average total cost in the local industry for providing the particular resource may prove to be very difficult to quantify given the multiplicity of product offerings. Moreover, the utilization of average unit cost for a particular subscriber unit may not reflect accurately reflect the actual unit costs of a particular concessionaire given varying labour productivity levels and network capacity utilization.</p> <p>(c) OPEX comprises all direct, indirect and common costs, including depreciation of the network. The formula provides no regulatory incentive for carriers to operate efficiently and as a consequence, efficient carriers cross subsidize inefficient carriers from a regulatory cost recovery perspective.</p>		<p>The Authority disagrees with this since the formulae proposed actually takes into consideration the expenses of an operator, as opposed to the methodology used in the previous fee regime.</p>

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		<p>(d) CPEX is an acronym to describe the weighted average cost of capital (WACC). Antilles Crossing notes that regulators in most other jurisdictions have moved away from rate of return mechanisms and suggests that the TATT should do likewise in this instance given the complexities of determining such costs. For purposes of the calculation, the average interest rate is deemed to be “the weighted average of nominal lending rates over a period of time on the local market.” There exist a number of difficulties with the use of such a broad definitions for interest rates and before-tax return on capital including:</p> <p>(i) There is no prescribed term to the imputed debt (short term, 90 day, one-year or ten year). Most asset-based telecommunications entities attempt to match asset lives (1-12 years) with bond maturities;</p> <p>(ii) The actual cost of a carrier's debt may be significantly above the imputed interest rate due to start-up and risk factors;</p>		

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		<p>(iii) Due to absence of well-developed local interest rate markets in Trinidad and Tobago, carriers may be forced to borrow in other currencies, notably the U.S. dollar, which may have significantly different interest rates;</p> <p>(iv) An individual carrier's equity risk premium will vary significantly from the industry average ERP and in particular, there will be a tremendous variance between the ERP of a well-established carrier and a new market participant.</p> <p>(v) The balance sheet structure can altered to inflate the before-tax cost of capital, notably by inflating the amount of higher cost equity relative to lower cost debt.</p> <p>(e) The regulated cost recovery formula provides no incentives for carriers to invest prudently in network facilities. Carriers which invest prudently cross subsidize those carriers who are capital inefficient.</p>		
	Existing service and/ or facility providers and	In TSTT's opinion the methodology adopted by the	TSTT recommends that in the interest of regulatory certainty and simplicity a	α is not an arbitrary figure, as it is a factor derived from activity-based costs.

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	affiliates (TSTT)	<p>Authority can imposed an onerous burden upon both the Authority and telecommunications concessionaires. This can create a high degree of uncertainty, especially where it can be argued that some of the indicators are chosen arbitrarily (<i>α per se</i>).</p> <p>TSTT suggest the following comments on the proposed methodologies (Section 5 & 6):</p>	fee structure should be chosen that minimizes the costs of regulatory oversight and compliance by concessionaires, as suggested in its comments to Section 1.4 above.	
Equation 1	Existing service and/ or facility providers and affiliates (TSTT)	The rules should be clear that the total expenses per annum (TAE_{t+1}) used in the equation for Concession fee per annum (CFNP) should be the annual approved budget for the Authority as determined by the Government of Trinidad and Tobago.	TSTT recommends that the document indicate that TAE is the annual budget for the Authority as determined by the Government of Trinidad and Tobago.	TAE is calculated in reference to the Annual Budget but is actually less than it.
	Existing service and/ or facility providers and affiliates (TSTT)	There is no indication how $\alpha_{i,j}$ (the proportion of total Authority expenses paid by a particular network-based provider in a particular time	TSTT recommends that $\alpha_{i,j}$ should be equal among similarly-situated concessionaires	α_{ij} is the same for similarly-situated concessionaires.

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		period) will be determined.		
	Existing service and/ or facility providers and affiliates (TSTT)	Notwithstanding TSTT's comments to Section 1.4 above, there is not enough information regarding the determination of β_i in the equation for Concession fee per annum. The draft document suggests that β will be the "rate of interest on Government Bonds," without specifying which Government Bonds' rates will be used.	Notwithstanding TSTT's comments to Section 1.4 above, if the Authority believes a β factor is required, TSTT believes it should be re-defined more specifically, and in consultation with the industry.	The issue of β is no longer applicable based on the revised document.
Equation 2	Existing service and/ or facility providers and affiliates (TSTT)	Notwithstanding TSTT's comments to Section 1.4 above, the calculation of the Net Free Cash Flow includes two components: (1) TOR, which is company-specific total revenue, and (2) TAC, which is average cost for the entire industry. This suggests that the Authority will annually determine average industry costs. Such an undertaking would be costly, time-consuming, and entirely unnecessary. The costs associated with developing average industry costs annually	Notwithstanding TSTT's comments to Section 1.4 above, TSTT recommends that TAC be the company-specific accounting costs for the previous year, if the Authority believes the Net Free Cash Flow should be determined.	The Authority agrees. The relevant changes have been made in the revised document.

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		<p>significantly outweigh the benefit of using average industry cost rather than company-specific cost. The Authority's approach will be costly for the consumers in Trinidad and is entirely unnecessary. Simply looking at other regulators around the world reveals that virtually no other regulatory body includes a measure for "average industry cost" in determining license fees. License fee revenue bases are sometimes offset by company-specific accounting costs, but we are not aware of any regulator that offsets revenue bases with hypothetical economic costs. If the Authority were intent on making current cost calculations each year there would be a number of highly contentious issues (e.g., the annual growth rate in prices for various pieces of equipment, the economic life of each asset) that the Authority would have to address. A</p>		<p>The Authority will use the actual accounts submitted by the provider for the purposes of fee calculation. However, where necessary, the Authority may require an audit process to confirm the accuracy of accounts submitted, and impose the relevant adjustments to the fee charged thereafter.</p>

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		<p>proceeding to address these issues would be costly and time-consuming. Economic cost proceedings can take 12 months to conclude in some instances, making them entirely inappropriate for inclusion in license fee determinations.</p> <p>The equation postulated herein also serves as a disincentive for efficiency and innovation, Efficient operators and service providers that maximizes TOR would be penalized heavily under this methodology. Similarly, innovativeness as per introducing new services would also increase the operator/provider's TOR and act as a disincentive. In fact, the converse hold true. Lack of innovativeness and Inefficient operators/providers are rewarded under this approach.</p> <p>Where the Authority's proposes to use industry cost a similar</p>		

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		effect arises.		
Equation 3	Existing service and/ or facility providers and affiliates (TSTT)	Equation 3 is unnecessary and confusing. It suggests that first the total volume of services must be calculated, and then the resulting number is multiplied times a total of all the prices. Clearly this is not a correct description of the proper way to calculate total revenues. Equation 4, while incomplete, is a more accurate representation of the method for calculating total revenues. TOR should be the sum of multiplying each service quantity by each service price.	TSTT recommends that Equation 3 be deleted.	Equation 3 applies to a single service while equation 4 applies to multiple services. This section has been revised to provide greater clarity.
Equation 4	Existing service and/ or facility providers and affiliates (TSTT)	Notwithstanding TSTT's comments to Section 1.4 above, Equation 4 is a more correct method for calculating total revenues than Equation 3; however, it is incomplete in the draft document. It appears to be the correct method for calculating total revenues, but there is no indication what D and P represent in the equation.	Notwithstanding TSTT's comments to Section 1.4 above, TSTT recommends that Equation 4 be clarified if this is to be employed.	The parameters have been defined to provide greater clarity.

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Equation 5-7	Existing service and/ or facility providers and affiliates (TSTT)	As discussed above, TSTT recommends that TAC reflect company-specific accounting costs. The description of OPEX and CPEX costs identified in Equation 5 are appropriate; however, pages 15-16 of the document are irrelevant to the discussion because they pertain to an adjustment to reflect "current costs." As discussed above, the Authority should not include any adjustments since they will be costly, time-consuming, and will result in hypothetical costs that may not reflect a single provider's actual costs. There is no other regulatory body in the world that we are aware of that accounts for hypothetical economic costs in the determination of license fees.	TSTT recommends that pages 15-16 of the document be deleted.	This comment is no longer applicable based on the revised version of the document.
Section 5.1: Secondary Allocation of Administrative Expenses Table 2	Existing service and/ or facility providers and affiliates (TSTT)	TSTT notes the different allocation to the various classes of services. Although not clear within this document, there may be an implicit understanding by	TSTT recommends that the weighting factor be revisited to achieve the overarching policy objectives that are eloquently outlined in Section 3 of the Act. In TSTT's view, once facility-	The Authority is of the view that the allocations for α is not biased, since the administrative requirements for network-based concessionaires will be significantly higher than that required for service-based concessionaires. However the Table has been revised in light of the sub-classifications proposed in

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		the Authority that Table 2 pertains to the weighting associated with α . However, it is very unfortunate that the weighting adopted by the Authority is biased against facility-based competition and favors service-based. This approach, from TSTT reading of the various policy documents published but TATT, is at variance with what has been expressed explicitly by the Authority. IN TSTT opinion, this approach can inhibit investment in network infrastructure and stymie the long-terms development of competition.	based competition is firmly established, the Authority should thereafter introduce service-based competition.	the revised Authorisation Policy.
5.1	Existing service and/ or facility providers and affiliates (CCTT)	Trans-Cable is unable to comment on the primary allocation of the TATT's total administrative expenses as between Concession-related Activities (50.41%) and Licence-related Activities (49.59%), as set out in Table 1 of the Fees Document, since the underlying calculations have not been provided to interested parties.		The Authority has used activity based criteria in determining the appropriate allocations / authorization category. However these allocations may change on review of the Regulatory Costs for the Authority after the review period for the fee structure.

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		In addition, Trans-Cable cannot comment on the secondary allocation set out in section 5.1 of the Fees Document for the same reason. Trans-Cable would appreciate the opportunity to review the underlying methods used to derive these allocations, which appear to have been based on relatively precise formulae, and to have a right to submit comments on those allocations after such review.		
5.1	Existing service and/ or facility providers and affiliates (CCTT)	The annual net cash flow begins with the “total operating revenues” of the concessionaire, apparently with no exception for revenues that are not derived from regulated telecommunications activities. Trans-Cable respectfully submits that this is an incorrect principle and that such exclusions should be allowed. If they are not, concessionaires will be obliged to structure their operating entities as strictly limited to the provision of regulated activities. This could unnecessarily impair the ability of concessionaires to maximize	For the foregoing reasons, and again without altering its fundamental opposition to the quasi-royalty charge in general, Trans-Cable respectfully submits that this charge ought to be calculated in a much simpler and more transparent manner. Trans-Cable submits that a simpler method, which could easily be understood by all and administered by the TATT, would be to base the charge on a concessionaire’s gross revenues from regulated activities.	Net Free Cash Flow is no longer applicable since the document has been revised.

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		<p>synergies within one corporate entity.</p> <p>Concessionaires are permitted to deduct "TAC_k" from total operating revenues. At one point, TAC_k is defined as "average total cost in the local industry for providing the particular resource/s" (emphasis added). At another point, it is defined as being the sum of "OPEX and CPEX" which are defined as follows: "OPEX comprises all the direct, indirect and common costs, including depreciation, of operating the network. CPEX involves network cost of capital i.e. payment due on debt (interest) and return to equity (dividends)" (emphasis added).⁵</p> <p>There appears to be an inconsistency in these two definitions. The first suggests that the TATT will create some average of all concessionaires' costs, while</p>		

⁵ Fees Document, page 14.

⁶ Fees Document, page 15.

⁷ Fees Document, page 11.

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		<p>the second suggests that the calculation will be based on each individual concessionaire's network. Without altering its objection to the concept of a quasi-royalty charge, Trans-Cable submits that it would be inequitable to base any deduction on some average of costs that are completely outside the control of any one concessionaire.</p> <p>The Fees Document also proposes to make further adjustments to the TAC_k "where markets are not sufficiently competitive".⁶ This statement creates an additional level of uncertainty, since there is no guidance given as to when a market would be considered to be insufficiently competitive, what factors the TATT would take into account in reaching this conclusion, whether the affected concessionaire would be advised and given an opportunity to make representations, or the basis upon which any adjustment would be calculated. Moreover, it is unclear what, if any, protection a concessionaire has from having its</p>		

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		<p>TAC_k calculated in one manner (assuming a competitive market) in one year and being advised in the subsequent year that the market is no longer sufficiently competitive and the method of calculation will be altered (presumably to reduce the TAC_k and increase the quasi-royalty charge payable).</p> <p>Once the net cash flow has been calculated, the portion of that amount that is payable is defined as “β” which is “the rate of interest on Government Bonds (risk free premium) at the relevant time”.⁷ Trans-Cable respectfully submits that this is an inappropriate factor to use. The rate for Government Bonds can vary, depending both on their length, which is not specified in the Fees Document. The rate can also vary, depending on the view that international lenders may take of the government at any particular time. If they conclude that the government has not managed its affairs responsibly, they will attach a greater premium than they would for prudent management.</p>		<p>This comment is no longer applicable as β has been removed.</p>

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		Therefore, using this factor in effect rewards the government of the day for acting imprudently and thereby raising the cost of its bonds. Trans-Cable submits that this cannot have been the intention of the TATT in suggesting this factor.		
5.1	Potential service and/ or facility providers and affiliates (Antilles Crossing)	Antilles Crossing is not in a position to question the year one allocation of Administrative Expenses contained in Table 2 and we hope that the Authority is in a position in future years to provide the underlying quantitative formula (number of licences, licence application flow, intervention flow, consumer complaints, etc.) to justify such allocations.	The associated policy could include similar provisions under 5.1., particularly items 3.	The Authority has used activity based criteria in determining the appropriate allocations / authorization category. However these allocations may change on review of the Regulatory Costs for the Authority after the review period for the fee structure.
Section 7				
7	Existing service and/ or network provider and affiliates (Caribbean Communications Network)	In respect of Commercial TVRO the reserve band is set at 550MHz, however we at TV6 only utilize at any one time channel bandwidths of a maximum of 6MHz of analogue space and approximately 2MHz of digital space. In addition the license admin fee of \$151,900+		In respect of commercial TVRO, the Authority will only charge for spectrum that is actually used for reception by the licensee.

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		<p>is way out of sync with the fees for other satellite services such as \$39,200 for VSAT.</p> <p>We believe therefore that the proposed structure is inconsistent and should be in line with the satellite services fee.</p>		
Section 9				
Review: Derived Demand for Spectrum in T&T	Existing service and/ or facility providers and affiliates (TSTT)	<p>TSTT duly notes in Section 9 of this document that the Authority spoke to the issue of rapid expansion of the T&T mobile market between 2000–05 and attempted to establish a correlation between average annual growth rate in earnings and that for mobile subscribe base.</p> <p>However, draws to the Authority's attention that the correlation alluded too can be very misleading, especially where there exists an implicit assumption that increase in subscriber base implies an increase in earnings. In fact, the evidence globally suggests otherwise. By its own</p>	<p>TSTT suggests that profitability of mobile providers is a direct derivative of effective demand. Further, this demand impacts directly upon the providers' profitability and ultimately fees.</p> <p>TSTT recommends that in deriving an appropriate fee methodology that the Authority continually incorporate the absence of a correlation between effective demand and provider's earning capabilities.</p>	The comment provided does not disprove the correlation spoken to in the document.

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		<p>admission, the Authority demonstrates at page 10 of its Revised Draft Interconnection and Access Policy, that in the Canadian market, that 89% of earnings are derived from approximately 36% of the market. This appears to be a trend replicated in T&T.</p> <p>Further, TSTT wishes to place on record that the rapid growth of the mobile market in T&T was directly correlated to TSTT business acumen wherein it introduced pre-paid and calling party paid in the period commencing 2000. Today, the market is witnessing the benefits of these insights of the company.</p>		
Section 11				
11	Existing service and/ or network provider and affiliates (Caribbean Communications Network Limited)	With respect to Spectrum Usage Fees the constraints of the physical terrain should be considered. To this end we at TV6 utilised CH 18 to aide in the distribution to parts of Port of Spain and its immediate environs, which area is consistent		CH 18 and 19 are UHF channels and therefore the \$20.00 / KHz fee would apply. The spectrum usage charges for both National and Niche are the same. The difference in charge would be based on whether the frequency falls in the VHF or UHF band.

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		<p>with the Authority's definition of niche market coverage. CH 19 is used as a repeater service specifically for addressing coverage in Scarborough and environs, another niche market.</p> <p>Accordingly the spectrum usage fee for CHs 18 and 19 should be \$20 per KHz as defined for the niche and minor territorial fee instead of the \$40. per KHz for national or major territorial.</p>		
11	Potential service and/ or facility providers and affiliates (Antilles Crossing)	Antilles Crossing believes that spectrum grading criteria and pricing theory is generally appropriate.	<p>However, we believe that the number of Grades should be increased to reflect the following factors:</p> <ul style="list-style-type: none"> (a) The use of spectrum for emergency restoration purposes of terrestrial fibre; (b) The use of unprotected spectrum; <p>The use of spectrum to provide connectivity between the island of Trinidad and the island of Tobago.</p>	<p>Unprotected spectrum falls within the category Grade 3.</p> <p>Spectrum for backhaul systems will be treated as a normal transmission link and fall in category Grade 2.</p>
Section 11.1 Fees for Grade 1 Spectrum	Existing service and/ or facility providers and affiliates (TSTT)	TSTT notes that the Authority has concluded that spectrum usage charges shall be derived through auction, via a	TSTT firmly objects to this provision, and believes that it needs to be revised, examining international best practice. At this time, the Authority	The Authority does not agree that the method used for determining the spectrum fee for bands outside of the auctioned bands

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		<p>suggestion within an National Audit Office Report, which has not even been adopted by the UK. TSTT has been unable to source this report to review its findings, and would appreciate the Authority providing its source.</p> <p>TSTT wishes to advise that throughout the world, it is recognized that the value of a licence at an auction is dependent upon the time at which the auction is conducted, the state of the market and the technologies and market demand available. Industry Canada has even remarked in its framework for Spectrum Auctions, that auction results will not be used to recalibrate the fees of incumbent licensees with similar spectrum, due to the uncertainty it places on licence holders, that its licence fee being continually</p>	<p>should determine an appropriate licence fee to allow the incumbent licensee to make an adequate return on its investment, much as how fees are determined for renewing auctioned licences.</p> <p>If however, the Authority is intent on re-calibrating licence fees based on auction outcomes, this is only applicable where the spectrum assignments are equitable, and if not, an appropriate concession/adjustment should be made for the disadvantaged party.</p>	

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		<p>adjusted during the term of its licence⁸, creating uncertainty in licence valuation. Furthermore, recalibration implies the retroactive application of today's valuations to licences awarded in the past, which is economically flawed.</p> <p>Furthermore, errors in winners' estimates of the value of a licence (the winner's curse) would be passed on to the entire industry.</p> <p>In the US, UK and Australia, auction outcomes are not used to assess licence fees for incumbent licensees. There is no country in the world that TSTT is aware of, where the full outcome of an auction is passed on to incumbent licensees.</p>		
11.1.1.1 Section 11.2 Spectrum	Existing service and/ or facility providers and affiliates (TSTT)	The methodology identified by the Authority for determining Spectrum Usage Charges is incomplete, confusing, and provides little, if any, guidance	TSTT recommends that the Authority delete Section 11.2 of the document and issue a new methodology for determining Grade 2 Spectrum Usage Charges that is clear, concise,	The formula for the calculation of Grade 2 spectrum is $S_{ucj} = K_{smj} (A_{smj})$ Reference can be made to the revised document.

⁸ Framework for Spectrum Auctions in Canada, Industry Canada, [http://strategis.ic.gc.ca/epic/internet/insmt-gst.nsf/vwapj/FRAME.PDF/\\$FILE/FRAME.PDF](http://strategis.ic.gc.ca/epic/internet/insmt-gst.nsf/vwapj/FRAME.PDF/$FILE/FRAME.PDF)

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<p style="text-align: center;"><i>Usage Charge for Grade 2</i></p> <p>Equation 11</p>		on the Spectrum Usage Charges.	straightforward and complete.	
	Existing service and/ or facility providers and affiliates (TSTT)	In Equation 11 K_{sm} is defined as a benchmark of the basic economic value of a frequency band. However, there is no indication how K_{sm} will be estimated. TSTT must be provided an opportunity to comment on the method by which the Authority intends to estimate K_{sm} .	TSTT recommends that the Authority indicate how it will estimate K_{sm} and provide parties an opportunity to comment on that method.	K_{sm} is a percentage of the weighted average of reserve prices(per MHz) of auctioned bands. These reserve prices are used as benchmarks for the basic economic value of the relevant frequency band.;
	Existing service and/ or facility providers and affiliates (TSTT)	A_{sm} is indicated as a secondary factor in the equation for the Spectrum Usage Charge, and is the function of seven variables. However, the document does not indicate <i>how</i> A_{sm} is a function of the seven variables. Is A_{sm} the product of each of the variables? Is A_{sm} the sum of each of the variables? The document sheds no light on how A_{sm} is calculated. It is virtually impossible for TSTT to comment on a spectrum usage	TSTT recommends that the Authority define how A_{sm} is a function of the seven variables.	Clarity has been provided in the revised document. $S_{uc} = K_{sm}[(\sum_{i=1}^5 F_i)/i]$

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		charge component that has not been defined.		
	Existing service and/ or facility providers and affiliates (TSTT)	In the explanation of F ₂ α is defined as the number of re-users of the same frequency. However, the term “re-user” is not defined.	TSTT recommends that the Authority define a “re-user” as it pertains to F ₂ .	Re-use means the re-assignment of spectrum by the Authority to additional licenses. Clarification has been made in the revised document.
	Existing service and/ or facility providers and affiliates (TSTT)	The definition of F ₃ is unclear and incomplete. It is not clear what the low density (L _d) is, what the high density (H _d) is, or what population and geographic area is used to calculate the population density coefficient D _i . Furthermore, there is no indication what defines a particular area as rural, suburban or urban.	TSTT recommends that the Authority clarify F ₃ .	F ₂ has been redefined in the revised document.
	Existing service and/ or facility providers and affiliates (TSTT)	F ₄ requires that the Authority determine a “basic standard radial distance”. There is no indication in the document what the standard is, nor how the Authority will determine the standard. All parties should be provided an opportunity to comment on both the method and the final result of such a	TSTT recommends that the Authority indicate how it intends to determine a “basic standard radial distance”.	The Authority has changed “basic standard” in the revised document to “technical specifications as set out by the Authority”. The technical specifications will be set out in the relevant spectrum plans/ or as a schedule to the relevant licences.

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		methodology.		
	Existing service and/ or facility providers and affiliates (TSTT)	F ₅ requires that the Authority determine a “basic standard EIRP”. There is no indication in the document what the standard is, nor how the Authority will determine the standard. All parties should be provided an opportunity to comment on both the method and the final result of such a methodology.	TSTT recommends that the Authority indicate how it intends to determine a “basic standard EIRP”.	The Authority has changed “basic standard” in the revised document to “technical specifications as set out by the Authority”. The technical specifications will be set out in the relevant spectrum plans/ or as a schedule to the relevant licences.
	Existing service and/ or facility providers and affiliates (TSTT)	F ₆ requires that the Authority determine a “basic standard beamwidth”. There is no indication in the document what the standard is, nor how the Authority will determine the standard. All parties should be provided an opportunity to comment on both the method and the final result of such a methodology.	TSTT recommends that the Authority indicate how it intends to determine a “basic standard beamwidth”.	The Authority has changed “basic standard” in the revised document to “technical specifications as set out by the Authority”. The technical specifications will be set out in the relevant spectrum plans/ or as a schedule to the relevant licences.
	Existing service and/ or facility providers and affiliates (TSTT)	F ₇ requires that the Authority determine a “basic standard number of units”. There is no indication in the document what the standard is, nor how the Authority will determine the	TSTT recommends that the Authority indicate how it intends to determine a “basic standard number of units”.	F ₇ has been removed as one of the coefficients in the revised documents.

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		standard. All parties should be provided an opportunity to comment on both the method and the final result of such a methodology.		