

***Consultation Paper on Spectrum Assignment Methodology for 4G  
and beyond for Fixed and Mobile Broadband Service***

***Telecommunication Regulatory Commission of Sri Lanka***

***276, Elvitigala Mawatha  
Colombo 8***

***Web: [www.trc.gov.lk](http://www.trc.gov.lk)  
e-mail [dgtsl@trc.gov.lk](mailto:dgtsl@trc.gov.lk)***

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## **1.0 Introduction**

TRCSL receives numerous requests for assignment of frequencies for 4G and beyond ,by mobile and fixed broadband operators without proper technical justification of actual spectrum requirement. Therefore TRCSL wishes to formulate a criteria for evaluation of real spectrum requirement of operators and proper spectrum assignment methodology for all Mobile and Fixed Broadband using technologies 4G and beyond.

In above circumstance, TRCSL wishes to circulate the attached consultation paper among all stakeholders for comments and suggestions. This consultation consists of Section 2.0 and Section 3.0 Section 2.0 is with regard to Assignment of Spectrum for additional spectrum by Licensed operators and Section B is with regard to assignment of spectrum for new entrants. Impartial answers for all queries made herein are expected. TRCSL reserves the final right of the decision of this consultation.

### **2.0 REQUEST FOR ADDITIONAL SPECTRUM BY EXISTING USERS**

#### *2.1 General Rule*

*It is mandatory in all scenarios that an operator will be assigned less than 50% of spectrum in each band and all bands to avoid monopolistic market trends.*

***Q1) Do you Agree? If not proper justification should be provided.***

#### *2.2 Eligibility*

*Operators will be considered eligible if they satisfy following criteria with respect to their present operation*

$$R_0 < R_i = \frac{C}{(E * \text{Coverage Area(Sq Km)})} \dots \text{Formula 1 or Approximately}$$

$$R_0 < R_i = \frac{C}{(E * B)} \dots \dots \dots \text{Formula 2}$$

*where  $B > B_0$  (Min No Macro Base Stations to qualify for additional spectrum)*

*Unit of  $R_i$  (GB / (MHz) ) per BS*

- B - No of Macro Base Stations*
- C - Total Averaged Monthly Data Volume*
- E - Effective Bandwidth*

Where  $E = \text{Assigned Bandwidth} \times K_1 \times K_2$   
 $K_1$  -Band Specific economic factor  
 $K_2$  -QOS degradation due to interference

**Q2) It is suggested to use Formula 2 for considering the simplicity. Do you agree? If not please suggest a formula with justification.**

**Q3) Please suggest values for  $B_0$  and  $R_0$  as Bench Mark values that TRCSL should adopt with justification.**

**Q4) suggest values for  $K_1$  and  $K_2$  with justification.  $K_1$  should be decided considering the factors like propagation loss, equipment cost etc in different Bands .  $K_2$  should be decided considering cross border interference and any other interference issues. Suggest Method of calculation  $K_1$  and  $K_2$ .**

### 2.3 Minimum Additional Spectrum Requirement

The Additional Spectrum Bandwidth to be assigned to an Operator who satisfies above should be greater than Existing Bandwidth \*  $\left(\frac{R_i}{R_o} - 1\right)$

**Q5) Do you agree? If not propose a value and justify.**

### 2.4 Assignment Criteria 1

If (No of eligible operators) < N (Number of Available Frequency Slots) then,

2.4.1 administrative allocation can be made for eligible operators by charging the upfront fee as per the upfront formula for a period of 10 years.

2.4.2 When assigning spectrum , target for proposed investment ,EBITDA, No of Base stations and Subscribers ,Total Average Monthly Data Volume, should be set to be implemented within 10 year period (with a yearly plan)

2.4.3 Also a Performance bond should be obtained to value X percent of the total proposed investment.

**Q6) Please suggest value for parameters given item 2.4.2 above with justification.**

**Q7) Suggest a value for parameter X in item 2.4.3 with justification**

## 2.5 Assignment Criteria 2

**Administrative Assignments when** If (No of eligible operators > N (Number of Available Frequency Slots) ,

2.5.1 All operator will be evaluated as per following formula and assignment will be made as per merit list. **However an operator who satisfies formula given in 2.2 above will be given highest priority.**

$$X_0 < X_i = \frac{(M_1A + M_2B + M_3C + M_4D)}{(E)}$$

- A - EBITDA (Note: Separate Accounts should be maintained for inclusion of this
- B - No of Base Stations
- C - Total Averaged Monthly Data Volume
- D - No of Subscribers
- E - Effective Bandwidth

$M_1, M_2, M_3, M_4$  - Sensitivity factors for each of above parameters

Where  $E = \text{Assigned Bandwidth} \times K_1 \times K_2$  As described in 2 above

$K_1$  - Band Specific economic factor

$K_2$  - QOS degradation due to interference

**Q8) Do you agree? If yes suggest a value for  $X_0$  . If not suggest a formula with justification. Suggest values for  $M_1, M_2, M_3, M_4$  .**

**Q9) If you disagree, suggest an alternative formula with justification**

## 2.5 Assignment Criteria 3

*Beauty Contest :*

All eligible operators can submit their proposal with respect to financial eligibility, Industry Experience, Technology enhancement , roll out plan and price offering etc. Evaluation through standard procedure. However all eligibility criteria explained above 2.2 should be met mandatorily .

**Q10) When do you think this methodology should be adopted? Explain.**

**Q11) Please indicate Any other general suggestions or alternative methodologies**

## 2.6 Assignment Criteria 4

*Spectrum Auction:*

*Spectrum Auction is an anti-competitive procedure when industry has no healthy competition. Therefore competition issues should be taken into account before proper design). However all eligibility criteria explained above 2.2 should be met mandatorily .*

**Q12) When do you think this methodology should be adopted? Explain.**

**Q13) Please indicate Any other general suggestions or alternative methodologies**

### **3.0 REQUEST FOR SPECTRUM BY NEW ENTRANTS**

#### *3.1 Eligibility Criteria*

*Availability of of a System Licence issued under Section 17 of Sri Lanka Telecommunications Act No 25 of 1991 (As amended) Licence to provide relevant wireless service.*

#### *3.2 General Rule*

*It is mandatory in all scenarios that an operator will be assigned less than 50% of spectrum in each band and all bands to avoid monopolistic market trends.*

**Q1) Do you Agree? If not proper justification should be provided.**

#### *3.3 Minimum Spectrum Requirement*

*Minimum Bandwidth to be assigned =  $B = C_{min}/(R_0)$*

*Where*

*$C_{min}$  is the minimum required monthly volume for a single cell.  $R_0$  is as specified in Item 2.2*

**Q2)Do you agree ? If yes, suggest values for  $C_{min}$ . If not suggest an alternative formula.**

**Q3) What are the minimum set of QOS parameters for mobile and fixed broadband as a new entrant that should be mandatorily met**

*Can assign minimum required bandwidth as above on an administrative basis.*

### 3.4 Commitments

3.4.1 When assigning spectrum, target for proposed investment ,EBITDA, No of Base stations and Subscribers ,Total Average Monthly Data Volume, should be set to be implemented within 10 year period (with a yearly plan)

3.4.2 Also a Performance bond should be obtained to value X percent of the total proposed investment.

**Q4) Please suggest value for parameters given item 3.4.1 above with justification.**

**Q5) Suggest a value for parameter X in item 3.4.2 with justification**

**Q6) Please indicate any other general suggestions or alternative methodologies**

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*The responses to the above consultation document should be addressed to*

*Director General  
Telecommunications Regulatory Commission(TRCSL)  
No 276,Elvitigala Mawatha,  
Colombo 8*

and submitted on or before 26<sup>th</sup> December,2018 by mail or fax

e-mail : [dgtsl@trc.gov.lk](mailto:dgtsl@trc.gov.lk) with a copy to [nihal@trc.gov.lk](mailto:nihal@trc.gov.lk)

fax :0112689341