



**Telecom Regulatory Authority of India**



## **Recommendations**

**On**

### **Allocation and Pricing of Microwave Access (MWA) and Microwave Backbone (MWB) RF Carriers**

(Response to reference received from Department of  
Telecommunications on recommendations of  
16<sup>th</sup> October 2015)

**17<sup>th</sup> November 2015**

Mahanagar Doorsanchar Bhawan,  
Jawahar Lal Nehru Marg, New Delhi-110002

# **TRAI's RESPONSE TO THE BACK REFERENCE OF DoT**

## **INTRODCUTION**

1. The Department of Telecommunications (DoT) through its letter dated 26<sup>th</sup> November, 2012 had requested the Authority to give its recommendations on the Allocation and Pricing of Microwave Access (MWA) and Microwave Backbone (MWB) RF carriers. In response, TRAI sought certain additional information and clarifications from DoT. The requisite information was made available by DoT in June-2013 and August-2014. After receiving the information, TRAI had initiated consultation process on the subject on 28<sup>th</sup> March, 2014. Based on the comments received from the stakeholders and further analysis and research, on 29<sup>th</sup> August, 2014, the Authority sent its Recommendation on 'Allocation and Pricing of Microwave Access (MWA) and Microwave Backbone (MWB) RF carriers' to DoT.
2. The Recommendations have been considered by DoT. On some of the issues, DoT need clarifications. Therefore, through its letter dated 16<sup>th</sup> October 2015, some of the recommendations have been referred back to the Authority for clarifications/reconsideration. A copy of the DoT's back reference is attached at **Annexure-I**.

## **Response of the Authority to the paras referred in back reference**

3. The Authority, after carefully going through the back reference, has noted that the main issue raised by DoT, in all the Microwave bands recommended by the Authority, is regarding allocation methodology of MWA and MWB carriers on administrative basis. Primarily, the DoT has asked the Authority to reconsider its recommendations with regard to assignment of Microwave carriers on administrative basis, stating that as administrative allotment follows the principle of 'first come first served' and the same has been denounced by the Supreme Court in its judgement on the 2G case.
4. Regarding allocation methodology of MW carriers, the Authority in chapter-2 of the recommendations in paras 2.18 to 2.29 and paras

2.44 to 2.62, has elaborately explained the rationale for continuing with the existing assignment methodology which was on administrative basis. Regarding query of DoT on legal issue of assignment methodology raised in paras from 5.1 to 5.7 and 5.10 to 5.15 of the back reference, the Authority has already communicated its stand vide its letter No. 102-6/2014-NSL-II dated 8<sup>th</sup> July, 2015 (Copy enclosed as **Annexure-II**). Further, a letter No. 102-6/2014-NSL-II dated 14<sup>th</sup> October, 2015 in this regard was also written.

5. On the DoT's request (i) to recommend methodology of allocation of spectrum/carriers to all categories of telecom licensees, methodology of charging including whether it can be linked to market discovered prices in some other band or not and associated terms and conditions and (ii) to provide its recommendations on methodology and pricing for allotment of carriers in these bands other than telecom service providers (DoT view in para 5.1 to 5.7), it is mentioned that these were not the parts of the original reference of the DoT on the subject.
6. Regarding charging of MWB link @Rs.13,900 per KM per annum (para 5.14), it is clarified that this charge is for one carrier of 2x28 MHz bandwidth. Charges for different carrier sizes, say 2x56 MHz should be determined proportionately.
7. On the paras 5.8, 5.17 & 5.19 of TRAI recommendations, DoT's view and TRAI's response to the same is given in the following paragraphs:

#### **A. Para 5.8**

*The Authority recommends that the higher frequency bands viz. 26 GHz, 28 GHz, 32 GHz, 38 GHz and 42 GHz should be earmarked for fixed point-to-point MW carriers and the channeling plan should be kept in line with the ITU-R recommendations. The Authority is also of the view that larger carriers of size 56 MHz (paired) and 112 MHz (paired) should also be assigned to the TSPs in these bands. As the number of assignments made in the 21 GHz band is quite small, the DoT may also examine the feasibility of assigning larger carrier sizes in this band. (Para 2.80)  
(TRAI Recommendation)*

## **DoT View**

- DoT is of the view that in addition to Point to Point links, the Point to Multipoint link/ usage may also be considered.
- Further, DoT is of the view that there is a need for high capacity backhaul links with introduction of newer technologies such as 4G, 5G and beyond to serve the rapidly increasing data traffic and therefore these bands may be opened up. This also happens to be in line with the TRAI recommendation herein. Broader bandwidths of 56 MHz and higher may also be considered as per TRAI recommendation.
- However, it is observed that these are shared bands for point-to-point and point-to-multi point links for public telecom networks as well as for other usages. Hence, there may be variable band width requirement in these bands.
- Further, it is noted that the provision of 56 MHz and higher bandwidths is not feasible in 21 GHz band due to its limited availability.
- These bands will be used for MWA.

Therefore, TRAI may reconsider their recommendation with respect to bandwidths of 56 MHz and higher in 21 GHz band.

In addition, the TRAI is also requested to provide its reconsidered recommendations on methodology and pricing for allotment of carriers in these bands to users other than telecom service providers.

## **Response of TRAI**

**In its recommendations the Authority had recommended to allot carriers for MWA on exclusive basis in 13-42GHz to the Telecom service providers(TSPs). It was also recommended that charging for the same should be done based on Adjusted Gross Revenue(AGR). It was also recommended that larger carriers of size 56 MHz (paired) and 112 MHz (paired) should also be**

assigned to the TSPs in higher frequency bands viz. 26GHz, 28GHz, 32GHz, 38GHz and 42GHz and proportionate charge for the same may be levied on the TSPs. The Authority is in agreement with the DoT's view that in addition to Point to Point links, the Point to Multipoint link/ usage may also be considered. However, the Authority is of the opinion that once exclusive carriers are assigned to the TSPs for MWA spectrum, they can use these carriers for point-point or point-to-multipoint links. Regarding allotment of these carriers to users other than TSPs, it is clarified that the same was not part of the original reference.

The Authority has noted DoT's submission that provision of higher bandwidth carrier is not feasible in the 21 GHz band due to its limited availability.

#### **B. Para 5.17**

*The Authority recommends that both E-band and V-band should be opened with 'light touch regulation' and allotment should be on a 'link to link basis'. The responsibility for registration and database management should lie with WPC wing of DoT. For this purpose, WPC should make necessary arrangements for an online registration process by developing a suitable web portal. Responsibility for interference analysis should rest with the licensee, who needs to check the WPC link database prior to link registration (links should be protected on a "first come, first served" basis). WPC can also maintain a waiting list for the same spot. (Para 4.31)*

*(TRAI Recommendation)*

#### **DoT View**

DoT noted the following:

- The 'Digital India' is flag ship initiative of the Government, which would require higher bandwidth to meet the increasing demands for higher data traffic.

- The TRAI has recommended allotment of E-band and V-band carriers on link to link basis, through on-line registration process on a separate web portal.
- The TRAI has also recommended that links should be protected on a “first come, first served” basis, which amount to allotment of carriers on first come, first served basis.
- The Judgement of Hon’ble Supreme Court of India in 2G case on methodology of allotment of spectrum, as mentioned in Annexure-I to this document.
- These bands will be used for MWA.

TRAI is requested to give its reconsidered opinion in respect of methodology of allotment, pricing and charging principles and associated terms and conditions in respect of TSPs and the users other than TSPs in light of views of DoT as detailed in Annexure-A.

### **Response of TRAI**

**Due to technology evolution and availability of wide channel bandwidths, the use of frequency bands in the V-Band and E-Band appear to be of interest for the current and future needs for backhaul networks. Regarding Licensing in these bands, the Authority had deliberated the issues in Chapter-4 of the recommendations and recommended that that both E-band and V-band should be opened under ‘light touch regulation’ and allotment should be on a ‘link to link basis’. With the proper interference management, same carrier can be used by many TSPs.**

### **V-band as license-exempt band for indoor and outdoor access applications:-**

**In India only two bands 2.4GHz (2.400-2.4835 GHz) and 5.8GHz (5.825-5.875GHz) have been defined as License-exempt bands for indoor and outdoor applications. With the rise in bandwidth hungry applications, rise in number of smart phones & devices, congestion is being observed in these two bands. The Digital India programme, a**

flagship initiative of the Government, envisages proliferation of e-government services across all citizens, which will require Government enabled/PPP model Wi-Fi hotspots across the public places to provide seamless access to its citizens. This shall put considerable pressure on the already congested delicensed bands. Therefore there is an urgent need to identify candidate bands which can be delicensed to cater to the huge demand in the near future. The V-band is a strong candidate band for the same. In their comments to the consultation paper on the subject, many stakeholders commented that many countries in the world have adopted the V-band and kept it as un-licensed band. Therefore, it should be kept as an un-licensed band in India too. They suggested that while keeping it under unlicensed category, reporting requirements can be mandated with details of location, spot frequency uses, antenna gain etc. for the purpose of maintaining records in WPC.

In its proposal to WRC-2015, India has proposed this band to be identified for ISM applications. The proposal of India reads as below:

*“IND/107A24/6<sup>1</sup>*

*1.2 to consider identification of frequency bands for ISM applications including possible additional allocations to the ISM on a primary basis around 60 GHz and higher bands;”*

**The Authority in its subsequent recommendations on ‘Delivering Broadband Quickly: What do we need to do?’ dated 7<sup>th</sup> April, 2015, has at para 3.19 mentioned that most countries have already de-licensed the 60 GHz band(V-band or WiGig band using 802.11ad) and this band has a good device ecosystem; India should also de-license the 60 GHz band immediately and make it available for consumers.**

**In view of the above, the Authority recommends that V-band (57-64GHz) should be delicensed for indoor and outdoor based access applications like WiFi hotspots etc.**

**For outdoor usages involving backhaul use, power requirement may be different than that in access applications. WPC may define parameters for access and backhaul applications in this**

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<sup>1</sup> <http://www.itu.int/md/R15-WRC15-C-0107/en>

**band. For V-band in backhaul applications, since it is important to maintain records in WPC about details of location of antennas, spot frequency uses, antenna gain etc so as to avoid any interference from the adjacent channels, it may continue to be on light-licensing and at the price recommended in the recommendations dated 29<sup>th</sup> August, 2014. WPC may carryout Electromagnetic Interference (EMI)/ Electro Magnetic Compatibility(EMC) analysis to ensure interference free coexistence of backhaul and access applications in the V-band in the same geographical locations and may place restrictions on the technical parameters like Max. EIRP, max. Transmitted power, antenna gain in line with international best practices.**

**C. Para 5.19**

*The Authority recommends that:*

- (a) E-band carrier should be charged at Rs. 10,000/- (Rs. Ten Thousand) per annum per carrier of 250 MHz each. More than one channel can be allocated and allowed for aggregation. There should be initial promotional discount of 50% for three years from the date of allocation of first carrier in this band.*
- (b) In case of charging of V-band carriers since there are limitations in this band due to the factors enumerated in para 4.28, it should be charged for Rs. 1000 (Rs. One Thousand) per annum per carrier of 50 MHz each. More than one channel can be allocated and allowed for aggregation. There should be initial promotional discount of 50% for three years from the date of allocation of first carrier in this band.*
- (c) To avoid spectrum hoarding which may be possible by the low fee structure, a rollout obligation should be attached to the licenses and a 12 month time limit for achieving the rollout goal may be given to the licensee failing which the spectrum for that particular spot may be taken back and assigned to next in the waiting list.*
- (d) The prices mentioned for E-band and V-band has to be reviewed after 5 years based on deployment and usage of the links. (Para 4.50)*

*(TRAI Recommendation)*



## **DoT View**

It is noted that TRAI has agreed with one of the stake holder's suggestion that the current pricing model (based on AGR) cannot be applied to these bands considering the quantum of available spectrum and the different characteristics of these bands.

Further, it is observed that TRAI has recommended that E-Band carriers should be charged at Rs. 10,000/- (Rupees Ten thousand) per annum per carrier of 250 MHz each. However, it is not clear that the above rate is for one link or for the entire service area.

Moreover, DoT is of the view that the initial promotional discount of 50%, as recommended by TRAI, may not be advisable as the charges recommended by the TRAI are already insignificant.

Further, it is unmanageable rather non-feasible to monitor and enforce the number of links deployed in these bands.

## **Response of TRAI**

**In its recommendations of V-band and E-band, the Authority recommended that allotment for backhaul should be on a 'link to link basis' and not on exclusive basis. Accordingly, the charges for these links were recommended on 'per-link' basis. Now since clarification on the same has been sought, the Authority would like to clarify that E-band carrier should be charged at Rs. 10,000/- (Rs. Ten Thousand) per annum per link per carrier of 2x250 MHz.**

**In order to promote the usage of these link for carrying higher amount of data and due to the fact that only short distances in line-of-sight can be covered using links in these bands, higher prices will not help in popularising these bands. Therefore, the Authority is of the view that there should be initial promotional**

**discount of 50% for three years from the date of allocation of first carrier in this band. This will help in proliferation of data services in the country. Accordingly, the Authority reiterates its recommendations and recommends that the same rate may be applied to other users viz. NLD, ILD, ISP etc. As mentioned in response to para 5.17 above, DoT may place restrictions on the technical parameters like Maximum EIRP, maximum Transmitted power, antenna gain etc in respect of both E-band and V-band in line with international best practices.**

Government of India  
Ministry of Communications and IT  
Wireless Planning and Coordination (WPC) Wing  
Sanchar Bhawan, 20 Ashoka Road,  
New Delhi-110001

No. L-14035/19/2010-BWA (Pt)

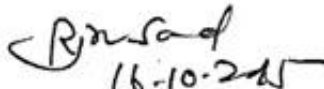
Dated: 16.10.2015

To,  
The Secretary,  
Telecom Regulatory Authority of India,  
Mahanagar Doorsanchar Bhawan,  
Jawahar Lal Nehru Marg (Old Minto Road),  
New Delhi-110002

**Subject:** Reference back/ Clarification on TRAI recommendations dated 29<sup>th</sup> August, 2014 on "Allocation and Pricing of Microwave Access (MWA) and Microwave Backbone (MWB) RF carriers".

Undersigned is directed to refer to TRAI DO No. 103-5/2012-NSL-II (Vol. III) Dated 29<sup>th</sup> August, 2014 vide which recommendations on "Allocation and Pricing of Microwave Access (MWA) and Microwave Backbone (MWB) RF carriers were forwarded to Secretary (T), DoT and to state that:

- (i) The above said recommendations of TRAI have been considered by the Government, but on some of the issues, a need to seek clarifications/ reconsidered recommendation is felt. Such issues are enclosed as Annexure.
- (ii) TRAI is requested to provide clarifications/ reconsidered recommendations in accordance with the provisions of Section 11 of the TRAI Act 1997, as amended in 2000.

  
16-10-2015  
(R.B. Prasad)  
Joint Wireless Adviser

Encl: As above

**Reference back to TRAI for considerations and clarifications on its Recommendations on “Allocation and Pricing of Microwave Access (MWA) and Microwave Backbone (MWB) RF carriers” dated 29<sup>th</sup> August, 2014**

Recommendations of TRAI				Issues for reconsideration/ clarification from TRAI																												
<p>5.1 The Authority recommends that TSPs should be assigned MWA carriers as per their requirement. However, it will be subject to a ceiling on the number of MWA carriers that can be assigned to a TSP as given in Table 2.5 below.</p> <p align="center">Table 2.5 Maximum No. of MWA carriers that can be assigned to a TSP</p> <table border="1"> <thead> <tr> <th>Quantum of Access Spectrum that a Licensee has in a LSA</th> <th>Metro/C at 'A' Circles</th> <th>Cat 'B' Circles</th> <th>Cat 'C' Circles</th> </tr> </thead> <tbody> <tr> <td>Less than 2.5 MHz</td> <td>3</td> <td>2</td> <td>2</td> </tr> <tr> <td>2.5 MHz or more but &lt; 5 MHz</td> <td>4</td> <td>3</td> <td>2</td> </tr> <tr> <td>5 MHz or more but &lt; 10 MHz</td> <td>5</td> <td>4</td> <td>3</td> </tr> <tr> <td>10 MHz or more but &lt; 15 MHz</td> <td>6</td> <td>5</td> <td>4</td> </tr> <tr> <td>15 MHz or more but &lt; 20 MHz</td> <td>7</td> <td>6</td> <td>5</td> </tr> <tr> <td>20 MHz or more but &lt;</td> <td>8</td> <td>7</td> <td>6</td> </tr> </tbody> </table>				Quantum of Access Spectrum that a Licensee has in a LSA	Metro/C at 'A' Circles	Cat 'B' Circles	Cat 'C' Circles	Less than 2.5 MHz	3	2	2	2.5 MHz or more but < 5 MHz	4	3	2	5 MHz or more but < 10 MHz	5	4	3	10 MHz or more but < 15 MHz	6	5	4	15 MHz or more but < 20 MHz	7	6	5	20 MHz or more but <	8	7	6	<p><b>Para 5.1 to 5.7:</b></p> <p><b>(I).</b> In these recommendations, TRAI has proceeded on its premise that the MWA and MWB carriers should be allotted on administrative basis, mainly on the following grounds mentioned in various paragraphs of the body of recommendations:</p> <ul style="list-style-type: none"> <li>(i) There is sufficient availability of carriers in MWA bands and other new bands can also be opened.</li> <li>(ii) MWA carriers are important for roll out and adoption of auction mechanism for MWA carriers may act as a barrier for new entrants due to uncertainty about availability of MWA carriers.</li> <li>(iii) Since access spectrum is assigned through auction, there seems to be no justification for another auction for assignment of microwave carriers, as these will be used by the Telecom Service Providers (TSPs) having access spectrum.</li> <li>(iv) Stake holders have indicated that auction should be the preferred method when demand is expected to exceed supply and currently carriers are available in</li> </ul>
Quantum of Access Spectrum that a Licensee has in a LSA	Metro/C at 'A' Circles	Cat 'B' Circles	Cat 'C' Circles																													
Less than 2.5 MHz	3	2	2																													
2.5 MHz or more but < 5 MHz	4	3	2																													
5 MHz or more but < 10 MHz	5	4	3																													
10 MHz or more but < 15 MHz	6	5	4																													
15 MHz or more but < 20 MHz	7	6	5																													
20 MHz or more but <	8	7	6																													

30 MHz			
30 MHz or but <40 MHz	9	8	7
40 MHz or more	10	9	8

Note:

1. If any TSP requires carriers in addition to what have been recommended above, it may be examined by the DoT on a case-to-case basis.
2. It has been assumed that each carrier is of size 2x28 MHz. Carrier of 2x56 MHz and 2x112 MHz should be counted as 2 and 4 carries respectively when applying the above ceiling.
3. Access spectrum indicated in this table is a paired spectrum. Therefore, unpaired access spectrum shall be counted as half for the purpose of applying the above ceilings e.g. 20 MHz of unpaired spectrum in the 2300 MHz band shall be considered as equivalent to 10 MHz (paired).
4. The above ceilings may be reviewed periodically. (Para 2.22)

5.2 The Authority recommends that the TSP should be assigned MW carriers as per their request as long as it is within the ceiling limit recommended in Para 2.22. (Para 2.29)

5.3 The Authority recommends that TSPs, holding MWA carriers in excess of the maximum number of carriers recommended by the Authority in Para 2.22, should be asked to surrender the excess MWA carriers in one year's time

- abundance.
- (v) For MWA carriers, link by link allotment requires interference management by WPC Wing, which is very difficult exercise.

**(II).** TRAI has recommended that MWA carriers may be allotted on exclusive basis for the LSA while MWB carriers be allotted on link to link basis, as per the existing practice.

**(III).** With the above background, the TRAI in paras 5.1 to 5.7 of summary of its recommendations has inter alia recommended ceiling on number of MWA carriers by linking it to the quantum of access spectrum held, surrender of excess carriers held, allotment in future of maximum four carriers 13/ 15 GHz bands, exclusive allotment of MWA carriers in 13-42 GHz bands, link by link allotment of MWB carriers and finally simultaneous allotment of access spectrum (through auction) and MWA carriers (within one month of payment for access spectrum) failing which, effective date of access spectrum should be shifted and compensation may be paid to the TSP.

**(IV).** The TRAI is requested for its reconsidered recommendation for MWA/MWB bands, taking into account the facts as detailed in **Annexure-A**.

**(IV.1) Microwave Access Spectrum (MWA):**

- A. The TRAI is requested to re-consider its recommendations for administrative allocation of MWA taking into account the facts mentioned in **Annexure-A**. In case reconsidered opinion on method of allotment is through auction or any other appropriate methodology ensuring transparency and

<p>period with effect from the date the new guidelines come into force. However, in case TSP is left with excess MWA carriers as a result of trading of spectrum, it will have to surrender the excess MW carriers within three months of the effective date of trade. In case TSP wants to retain them, it should be permitted to do so, only if it is able to justify the need of additional carriers to the satisfaction of the DoT. (Para 2.40)</p>	<p>taking into account the judgement of Hon'ble Supreme Court of India in 2G case, TRAI is requested to recommend reserve price, Spectrum Usage Charge (SUC), quantum of spectrum/carriers to be allotted to the existing licensees holding MWA spectrum and licensees who do not hold MWA spectrum, migration path for existing administratively allocated MWA spectrum to auction based allocation of MWA spectrum, methodology of auction and associated terms and conditions.</p>
<p>5.4 The Authority recommends that, in future, no TSP should be assigned more than 4 MWA carriers in the 13/15 GHz band. In other bands too, there should be equitable distribution of carriers as far as possible. However, this would not have any impact on existing assignments. This is because of the fact that any re-arrangement of MWA carriers already assigned to TSPs will force them to redesign their network which will require them to incur significant costs. (Para 2.43)</p>	<p><b>(IV.2) Microwave Backbone (MWB):</b></p> <p>It is noted that microwave backbone carriers are allotted on link to link basis in a service area or between service areas and not on exclusive basis i.e. same carrier can be allotted to more than one operator (which is not the case for MWA spectrum). The SUC is levied on the basis of percentage of AGR. Further, allotment of MWB carriers through auction may result in exclusivity for successful bidders and thus sub-optimal use of MWB carriers as the usability of that frequency spot by others licensees will be blocked..</p>
<p>5.5 The Authority recommends that the assignment of MWA carriers should be done on an exclusive basis for the various spectrum bands in 13-42 GHz range whereas the assignment of MWB carriers should be done on a link-to-link basis. (Para 2.58)</p>	<p>However, in the light of the Supreme Court judgement of 02.02.2012 in 2G case, it is clear that while allotting spectrum, the issues relating to 'First Come First Served' (FCFS) as well as auction of spectrum are to be addressed. TRAI in its recommendations has suggested that Microwave Backbone Spectrum should continue to be allotted administratively. Any administrative allotment follows the principle of FCFS which has been denounced by the Supreme Court.</p>
<p>5.6 The Authority recommends that the assignment of MWA and MWB carriers should continue to be done administratively. (Para 2.62)</p>	
<p>5.7 The Authority recommends that:</p>	

<p>i. The assignment of MWA carriers should be done for the entire LSA.</p> <p>ii. Assignment of both access spectrum and MWA carriers should be done simultaneously within a period of one month from the date the TSP makes the payment for access spectrum, failing which TSP should be paid compensation at the SBI PLR rate of the amount it had already paid to acquire the access spectrum.</p> <p>iii. In case of delay in the assignment of MWA carriers for a new TSP in a LSA, the effective date of access spectrum assignment may be taken as the date of assignment of the first MWA carrier. (Para 2.69)</p>	<p>Further, there may be instances where a particular spot frequency is claimed by two licensees and the policy should provide for resolution of such situations.</p> <p>Therefore, the TRAI is requested to re-consider its recommendations for allotment of microwave backbone spectrum. TRAI is also requested to recommend methodology of allocation of spectrum/carriers to all categories of telecom licensees, methodology of charging including whether it can be linked to market discovered prices in some other band or not and associated terms and conditions.</p> <p>In addition, the TRAI is also requested to provide its reconsidered recommendations on methodology and pricing for allotment of carriers in these bands to users other than telecom service providers.</p>
<p>5.8 The Authority recommends that the higher frequency bands viz. 26 GHz, 28 GHz, 32 GHz, 38 GHz and 42 GHz should be earmarked for fixed point-to-point MW carriers and the channelling plan should be kept in line with the ITU-R recommendations. The Authority is also of the view that larger carriers of size 56 MHz (paired) and 112 MHz (paired) should also be assigned to the TSPs in these bands. As the number of assignments made in the 21 GHz band is quite small, the DoT may also examine the feasibility of assigning larger carrier sizes in this band. (Para 2.80)</p>	<ul style="list-style-type: none"> <li>• DoT is of the view that in addition to Point to Point links, the Point to Multipoint link/ usage may also be considered.</li> <li>• Further, DoT is of the view that there is a need for high capacity backhaul links with introduction of newer technologies such as 4G, 5G and beyond to serve the rapidly increasing data traffic and therefore these bands may be opened up. This also happens to be in line with the TRAI recommendation herein. Broader bandwidths of 56 MHz and higher may also be considered as per TRAI recommendation.</li> <li>• However, it is observed that these are shared bands for point-to-point and point-to-multi point links for public</li> </ul>

	<p>telecom networks as well as for other usages. Hence, there may be variable band width requirement in these bands.</p> <ul style="list-style-type: none"> <li>• Further, it is noted that the provision of 56 MHz and higher bandwidths is not feasible in 21 GHz band due to its limited availability.</li> <li>• These bands will be used for MWA.</li> </ul> <p>Therefore, TRAI may reconsider their recommendation with respect to bandwidths of 56 MHz and higher in 21 GHz band.</p> <p>In addition, the TRAI is also requested to provide its reconsidered recommendations on methodology and pricing for allotment of carriers in these bands to users other than telecom service providers.</p>
<p>5.10 The Authority recommends that there should not be any upfront charges for the assignment of MWA and MWB carriers. (Para 3.17)</p>	<p>The DoT's views on Para 5.1 to 5.7 above may be referred.</p>
<p>5.11 The Authority recommends that the AGR based spectrum charging mechanism for MWA carriers should be continued. However, for MWB carriers, the charging should be done on a link-to-link basis as is being done for all other terrestrial MW links. (Para 3.25)</p>	<p>The DoT's views on Para 5.1 to 5.7 above may be referred.</p>
<p>5.12 The Authority recommends that the following spectrum charges for MWA carriers (28 MHz paired) should be made applicable for access service providers.</p>	<p>The TRAI is requested for its reconsidered recommendations of methodology for allotment and pricing of MWA/MWB carriers, as mentioned in the DoT's views on paras 5.1 to 5.7</p>



Table 3.7					<p>above.</p> <p>In addition, the TRAI is also requested to provide its reconsidered recommendations on methodology and pricing for allotment of carriers in these bands to users other than telecom service providers.</p>
No. of MWA carriers assigned to a TSP	Applicable Percentage of AGR as spectrum charge for MWA carriers				
	13/15 GHz	18/21 GHz	26/28/32	38/42 GHz	
1	0.17%	0.12%	0.10%	0.07%	
2	0.34%	0.24%	0.20%	0.14%	
3	0.51%	0.36%	0.30%	0.21%	
4	0.68%	0.48%	0.40%	0.28%	
5	0.85%	0.60%	0.50%	0.35%	
<p>5.13 The Authority recommends that if a TSP, holding MWA carriers in excess of the maximum number of carriers recommended by the Authority in Para 2.22, fails to justify the retention of additional carriers to the DoT and does not surrender the excess MWA carriers within the specified time limits (i.e. either one year or three months as the case may be), it shall be liable to pay an additional 25% of total MWA spectrum charges that the TSP is otherwise liable to pay for the period in excess of permissible period. (Para 3.42)</p>					DoT's views on Para 5.1 to 5.7 above may be referred.
<p>5.14 The Authority recommends that spectrum charges for MWB link shall be Rs. 13,900 per KM per annum. (Para 3.57)</p>					DoT's views on Para 5.1 to 5.7 above may be referred.
<p>5.15 The Authority recommends that present spectrum</p>					

<p>charges for terrestrial Point-to-Point MW links (other than MWB links used in cellular network) should be rationalized and should be the same as have been recommended for MWB links. (Para 3.60)</p>	<p>DoT's views on Para 5.1 to 5.7 above may be referred.</p>
<p>5.16 The Authority recommends that in order to increase broadband penetration in India, the usage of high capacity backhaul E-band (71-76 / 81-86 GHz) and V-band (57-64MHz) may be explored for allocation to the telecom service providers. (Para 4.17)</p>	<p>DoT is of the view that there is a need for high capacity backhaul links with introduction of newer technologies such as 4G, 5G and beyond to serve the rapidly increasing data traffic and therefore these bands may be opened up. This also happens to be in line with the TRAI recommendation herein.</p>
<p>5.17 The Authority recommends that both E-band and V-band should be opened with 'light touch regulation' and allotment should be on a 'link to link basis'. The responsibility for registration and database management should lie with WPC wing of DoT. For this purpose, WPC should make necessary arrangements for an online registration process by developing a suitable web portal. Responsibility for interference analysis should rest with the licensee, who needs to check the WPC link database prior to link registration (links should be protected on a "first come, first served" basis). WPC can also maintain a waiting list for the same spot. (Para 4.31)</p>	<p>DoT noted the following:</p> <ul style="list-style-type: none"> <li>• The 'Digital India' is flag ship initiative of the Government, which would require higher bandwidth to meet the increasing demands for higher data traffic.</li> <li>• The TRAI has recommended allotment of E-band and V-band carriers on link to link basis, through on-line registration process on a separate web portal.</li> <li>• The TRAI has also recommended that links should be protected on a "first come, first served" basis, which amount to allotment of carriers on first come, first served basis.</li> <li>• The Judgement of Hon'ble Supreme Court of India in 2G case on methodology of allotment of spectrum, as mentioned in Annexure-I to this document.</li> <li>• These bands will be used for MWA.</li> </ul> <p>TRAI is requested to give its reconsidered opinion in respect of methodology of allotment, pricing and charging principles and associated terms and conditions in respect of TSPs and the users other than TSPs in light of views of DoT as detailed in <b>Annexure-A</b>.</p>

<p>5.18 The Authority recommends that:</p> <p>(a) Channel bandwidth for E-band (71-76 GHz and 81-86 GHz) should be 250MHz with a guard band of 125MHz at the top and bottom of each 5 GHz band. More than one channel can be allowed and allocated for aggregation.</p> <p>(b) Channel bandwidth for V-band (57-64 GHz) should be 50MHz with a 100MHz guard band at the beginning of the band. More than one channel can be allowed and allocated for aggregation. (Para 4.37)</p>	<p>(a) DoT is of the view that ITU-R recommendations for this band may be followed, which also happens to be in line with TRAI recommendation.</p> <p>(b) DoT is of the view that ITU-R recommendations for this band may be followed, which also happens to be in line with TRAI recommendation.</p>
<p>5.19 The Authority recommends that:</p> <p>(a) E-band carrier should be charged at Rs. 10,000/- (Rs. Ten Thousand) per annum per carrier of 250 MHz each. More than one channel can be allocated and allowed for aggregation. There should be initial promotional discount of 50% for three years from the date of allocation of first carrier in this band.</p> <p>(b) In case of charging of V-band carriers since there are limitations in this band due to the factors enumerated in para 4.278, it should be charged for Rs. 1000 ( Rs. One Thousand) per annum per carrier of 50MHz each. More than one channel can be allocated and allowed for aggregation. There should be initial promotional discount of 50% for three years from the date of allocation of first carrier in this band.</p> <p>(c) To avoid spectrum hoarding which may be possible by the low fee structure, a rollout obligation should be</p>	<p>(a) to (d):</p> <p>It is noted that TRAI has agreed with one of the stake holder's suggestion that the current pricing model (based on AGR) cannot be applied to these bands considering the quantum of available spectrum and the different characteristics of these bands.</p> <p>Further, it is observed that TRAI has recommended that E-Band carriers should be charged at Rs. 10,000/- (Rupees Ten thousand) per annum per carrier of 250 MHz each. However, it is not clear that the above rate is for one link or for the entire service area.</p> <p>Moreover, DoT is of the view that the initial promotional discount of 50%, as recommended by TRAI, may not be advisable as the charges recommended by the TRAI are already insignificant.</p> <p>Further, it is unmanageable rather non-feasible to monitor and enforce the number of links deployed in these bands.</p>

attached to the licenses and a 12 month time limit for achieving the rollout goal may be given to the licensee failing which the spectrum for that particular spot may be taken back and assigned to next in the waiting list.

(d) The prices mentioned for E-band and V-band has to be reviewed after 5 years based on deployment and usage of the links. (Para 4.50)

Hence, in respect of Para 5.16 to 5.19, TRAI is requested to provide its reconsidered recommendations on methodology of allotment, pricing and basis for levy of spectrum usage charges, enforcement of roll out conditions and associated terms and conditions.

**Analysis of the issue of the administrative allotment and pricing of  
MWA/MWB carrier**

1. It is noted that:

(i) That para 2.2 of Notice Inviting Applications dated 28.09.2012 for auction of Right to Use spectrum held in November, 2012 stipulates the following in respect of MWA/MWB:

*“Allotment of spectrum for individual point-to-point fixed links i.e. Microwave Backhaul Spectrum would be subject to separate application and the allotment of the same is not linked to the compliance of roll out obligations. The allotment of backhaul spectrum is subject to the usual processes, terms and conditions, and applicable charges. The Government shall make available spectrum for these purposes under the terms and conditions specified by the WPC Wing, subject to availability. However, it must be noted that these frequencies are not part of the Auctions, and payment of the Successful Bid Amount does not ensure allotment of backhaul spectrum. Separate charges as prescribed from time to time, are payable for backhaul spectrum”.*

The same clause has been repeated in the subsequent auctions.

(ii) Further, in the queries and responses in respect of auction of Right to use spectrum held in November, 2012 , it was clarified that

“Queries & Responses No. 23 & 44 dated 12.10.2012 on Auction of Spectrum in 1800MHz and 800MHz Bands:

S. No.	Query	Response
23	For holders of quashed licenses who have	Completion of formalities

	<p>existing operations, it is necessary to have continuity of operations without disruption. Hence, in this case since their eligibility is already established, can they be granted licenses along with the spectrum allocation and the requisite license fee be paid along with the payment for spectrum won in the auction? The operators who wish to avail this option can select their option for the type of license which they want in the application for the upcoming auction. Please confirm.</p>	<p>relating to grant of licenses and allocation of spectrum is expected to be completed within 40 days from the date of conclusion of auction.</p>
44	<p>The current auction is a Supreme Court (SC) mandated auction, arising out of the quashing of 2008 licenses. However some of the holder of quashed licenses like ourselves, who are serious operators, have invested in roll-out of extensive networks and currently provide services to millions of customers. However the Information Memorandum (IM) has now put such licensees on par with any new entrant (who has no current investment or existing subscribers). In case such a serious operator bids and wins in the auction, in order to ensure continuity of services to its customers, please confirm the following :</p> <p>a. All our current 1800 MHz spectrum allocation spots would remain unchanged.</p> <p>b. Existing roll-out obligations, if already met, would not need to be re-done.</p>	<p>a. This cannot be confirmed.</p> <p>b. Quashed licensee needs to re-offer.</p>

<p>c. All TERM cell roll-out certifications would remain valid.</p> <p>d. <u>All backhaul spectrum-access and backbone would remain unchanged.</u></p> <p>e. All approvals such as SACFA, Deployments &amp; Wireless Operating license would remain unchanged.</p> <p>f. All Interconnect agreements and existing PoIs would remain unchanged and we would not be forced by large/ existing operators for any changes in existing agreements. Typically, we would not be forced to become interconnect seekers afresh and existing operating interconnect routes will not be disturbed.</p> <p>g. All our existing mobile number series, Signaling point codes, MNC codes allocations would remain unchanged.</p> <p>h. All other approvals from DOT /MHA / other Central and Local Government</p>	<p>c. Same as above.</p> <p>d. <u>These are expected to remain unchanged unless any specific situations require a review.</u> <b><i>(emphasis provided)</i></b></p> <p>e. SACFA clearances are to be revalidated, wireless operating licenses are to be obtained afresh, deployment plans to be re-submitted and approvals obtained.</p> <p>f. The interconnect agreements would be governed by the relevant TRAI regulations/ directions/ guidelines.</p> <p>g. These resources are expected to remain unchanged unless any specific situations require a review.</p> <p>h. Same as above. However,</p>
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	agencies like Lawful Interception, EMF Certifications, ROW, Site Clearances, pollution Control etc would remain valid	the licensees may check themselves about the clearances relevant to the Central/ State Governments/ local bodies.
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(iii) In I.A. No. 11 of 2012 in Writ Petition (Civil) No. 423 of 2010, the Hon'ble Supreme Court in its order dated 15/02/2013 has inter-alia directed that

*".....(iv) **The licensees**, who did not give bid in the auction conducted on 12.11.2012 and 14.11.2012 or who remained unsuccessful shall forthwith discontinue their operations in the concerned circles/ areas and **the successful applicants should be allowed to operate in those circles/ areas...."***  
(Emphasis added)

**(iv) Provisions in respect of expired licenses:**

In the Queries & Responses issued to the Notice Inviting Applications dated 12.12.2013, on the related matter under Query No. 146, it was clarified as below:

<b>Query</b>	<b>Response</b>
<p>146. DoT may please confirm that the clearances and approvals already taken by the companies/ licensees whose licenses are expiring in 2014 as per DoT, will continue to be valid and applicable and will not have to be applied / taken afresh, assuming that the same company takes UL before expiry of its current UASL in 2014 (as per DoT) and is also successful bidder for spectrum. This is important to ensure continuity and quality of service to consumers. These clearances and approvals include, inter alia:</p> <ul style="list-style-type: none"> <li>• SACFA clearances to the extent that the</li> </ul>	<p>Please Refer Amendment No. 2 to NIA for Resources Transfer.</p>



<p>same spots are re-acquired</p> <ul style="list-style-type: none"> <li>• MW Access carriers for metros and non-metros/ MW backbone carriers for non-metros</li> <li>• Access codes (mobile number series)</li> <li>• MSC codes</li> <li>• SP codes</li> <li>• MCC codes</li> <li>• MNC codes</li> <li>• Separate Mobile Number series to telemarketers</li> <li>• EMF certifications</li> <li>• LI clearances</li> <li>• Interconnect agreements and existing POIs</li> <li>• Clearances for launch of Data &amp; Voice/ SMS Services</li> <li>• Roll out obligations/ verifications from TERM cells</li> </ul>	
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(v) Amendment No.2 to the Notice Inviting Applications (NIA) dated 12 December, 2013 regarding Resources Transfer stipulates that:

“12 Clause No. 3.6.3: Resources Transfer: This para is added and may be read as: The Resources, coverage test certificates issued to existing licensees as a part of compliance to roll-out obligations and the service authorisations already granted to existing licences whose licences are expiring in 2014 and are treated as new entrant, will be transferred to the respective authorisations for Access Services under Unified Licence for that service areas.”

(vi) Keeping in line with the clarifications, UL guidelines were amended to state as below:

*"8.4 The Resources, except the spectrum won in the auction, coverage test certificates issued to existing licensees as a part of compliance to roll-out obligations, extant permissions for deployment for foreign Nationals and the service authorisations already granted to existing licences whose licenses have expired/ are expiring in future, will be reassigned/ revalidated to the respective authorisations under new Unified License for that service areas unless any specific situation requires a review. This shall be subject to realisation of charges/ fees for each resource as applicable in conformity with the extant guidelines/ instructions.*

*Resources shall mean Mobile Country Code (MCC), Mobile Network Code (MNC), Access Codes, Signalling Points Codes (SPC), Location Routing Number (LRN), Telemarketers Numbers, and Frequency for Microwave backhaul, Very Small Aperture Terminal (VSAT) clearances from Network Operation and Control Centre (NOCC), Frequencies for Satellite Based Service, Standing Advisory Committee for Frequency Allocation (SACFA) clearances and other administratively assigned frequencies."*

## **2. Microwave Access Spectrum (MWA):**

In the light of the Supreme Court judgement of 02.02.2012 in 2G case, it is clear that while allocating spectrum the issues relating to 'First Come First Served' (FCFS) as well as auction of spectrum are to be addressed. The TRAI, in its recommendations, has suggested that Microwave Access Spectrum (MWA) should continue to be allotted administratively on exclusive basis in a service area. Any administrative allotment follows the principle of FCFS which has been denounced by the Supreme Court in 2G case. Further, the DoT feels that any allotment on exclusive basis is desirable only on the basis of auction or any other appropriate methodology ensuring transparency and taking into account the judgement of the Hon'ble Supreme Court in 2G case. As per the present method, MWA spectrum has been allotted on exclusive basis in a service area and SUC is levied on the basis of percentage of AGR.

2.1 Therefore, DoT is of the view that in respect of Microwave Access spectrum, TRAI may be requested to re-consider its recommendations for administrative allocation of MWA taking into account the facts mentioned above. In case reconsidered opinion on method of allotment is through auction or any other appropriate methodology ensuring transparency and taking into account the judgement of Hon'ble Supreme Court of India in 2G case. TRAI may also be requested to recommend reserve price, Spectrum Usage Charge (SUC), quantum of spectrum/carriers to be allotted to the existing licensees holding MWA spectrum and licensees who do not hold MWA spectrum, migration path for existing administratively allocated MWA spectrum to auction based allocation of MWA spectrum, methodology of auction and associated terms and conditions.

### **3. Microwave Backbone (MWB):**

3.1 Since MWB carriers are allotted on link to link basis in a service area or to another service area and not on exclusive basis (unlike MWA spectrum), the auction may result in sub-optimal use of MWB carriers as usability of those frequency spots by others will be blocked in that service area or across service areas.

3.2 However, in the light of the Supreme Court judgement of 02.02.2012 in 2G case, it is clear that while allocating spectrum, the issues relating to 'First Come First Served' (FCFS) as well as auction of spectrum are to be addressed. TRAI in its recommendations has suggested that Microwave Backbone Spectrum should continue to be allotted administratively in a service area. Any administrative allotment follows the principle of FCFS which has been denounced by the Supreme Court.

3.3 Therefore, the issue of first come first served has to be addressed in order to ensure that the principles emphasised by the Hon'ble Supreme Court in 2G case are adhered to. There may be instances where a particular spot frequency is claimed by two licensees and the policy should provide for resolution of such situations.

3.4 In the light of the above, TRAI is requested to re-consider its recommendations for allotment of microwave backbone spectrum. TRAI is also requested to recommend methodology of allocation of spectrum/carriers to all

categories of telecom licensees, methodology of charging including whether it can be linked to market discovered prices in some other band or not and associated terms and conditions.



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TELECOM REGULATORY AUTHORITY OF INDIA

भारत सरकार/Government of India

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No.102-6/2014-NSL-II

Dated: 8<sup>th</sup> July, 2015

To,

The Secretary  
Department of Telecommunications,  
Ministry of Communications & IT,  
Sanchar Bhawan,  
20, Ashoka Road  
New Delhi-110001.

**Subject: TRAI Recommendations on Allotment of Spectrum to captive users (in IMT/Non-IMT bands) and for to various satellite usages.**

Please refer to your letter dated 08.06.2015, wherein it has been stated that in continuation of Ministry's letter No. R-11014/01/2014-NT dated 21.02.2014 and in view of Hon'ble Supreme Court Judgment dated 02.02.2012 in Writ Petition (Civil) No. 423 of 2010 and Writ Petition (Civil) No. 10 of 2011 (2G Case) and Opinion of Hon'ble Supreme Court dated 27.09.2012 upon the Special Reference by the President of India, the Department of Telecom is deliberating on appropriateness of allotment of spectrum administratively at administrative pricing to captive users (in IMT/ non-IMT bands) and for satellite networks of broadcasting and captive VSATs, commercial satellite usages.

2. The DoT has, vide its aforesaid letter dated 08.06.2015, requested TRAI to provide its recommendations on "*whether it is appropriate to allot spectrum administratively at administrative pricing to captive users (in IMT/Non-IMT bands) and for satellite usage. If so, its methodology and pricing may be recommended. In case, in all or for few services, it is considered appropriate to allot spectrum in auction, recommendation on auction methodology as well as reserve price along with associated conditions may also be given.*"

3. In this regard attention is invited to **DoT's earlier letter No.R-11014/01/2014-NT dated 21.02.2014**, vide which, while conveying its decision to allot spectrum on administrative basis for commercial and captive usage of satellite network and that SUC for captive networks will be levied administratively on formula basis, it has sought TRAI's recommendations only on the applicability of differential spectrum charges for such usage.

4. Further, DoT had also sought recommendations on the pricing of spectrum in cases where it cannot be discovered through auction. In this connection the DoT had categorized the spectrum in three categories viz. (a) non-commercial usage, (b) captive usage by commercial entities and (c) for social purposes e.g. Community Radio Stations. Regarding spectrum usage for social purposes, DoT has communicated that "*the spectrum usages for social purposes such as Community Radio Stations (CRS) etc. spectrum allotment to such usages is being made on administrative basis at administrative spectrum pricing.*"

Contd...2/-



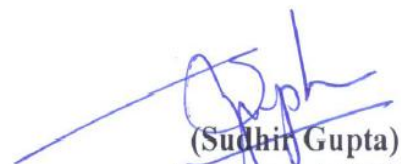
5. As is evident from the contents of the above mentioned two letters dated 21.02.2014 and 08.06.2015, there is apparent contradiction in as much as DoT having already communicated its decision regarding allotment of spectrum for captive as well as for commercial satellite services to be on administrative basis, now in its second reference dated 08.06.2015, is asking the Authority to give its recommendations on appropriateness of allocating spectrum administratively to captive users and for satellite usages. It is pertinent to note that the judgment of the Hon'ble Supreme Court dated 02.02.2012 and the decision on the Presidential Reference, which have been quoted in the reference dated 08.06.2015 as the reason for seeking recommendations of the Authority, was available with the Government at the time of making the first reference dated 21.02.2014.

6. From the letter of DoT dated 08.06.2015, it emerges that the main issue is that, in view of the judgment of the Supreme Court dated 02.02.2012, whether spectrum can be allotted by a mechanism other than auction. The Authority, as the Regulator, is mandated under section 11(1) (a) of TRAI Act to make recommendations, either suo motu or on request from the licensor, only on the matters listed under sub-clauses (i) to (viii) of section 11(1) (a) of TRAI Act. **It is for DoT to take a policy decision as to whether it is legally tenable to allocate spectrum by any other mechanism (viz. administrative) than auction in consultation with the Ministry of Law.**

7. It is also seen that in its reference dated 08.06.2015, DoT has sought recommendations of TRAI on the methodologies and pricing for allocation of spectrum to captive users (in IMT/Non-IMT bands) and for satellite usage. It may be noted that spectrum for telecom services ranges from audio frequencies (few KHz) to the extremely high frequencies (EHF) (several hundred GHz). As per the National Frequency Allocation Plan, 2011 there are 41 different kinds of services which can be provided on these frequencies. Multiple services can be provided in one band and one service can be given in multiple bands. In view of the above, DoT's reference seeking recommendations of the Authority on such a wide range of frequencies covering so many services needs review.

8. In view of the above, **DoT may take appropriate decision in the matter and thereafter, seek fresh recommendations of the Authority, in accordance with the provisions contained under sub-clauses (i) to (viii) of sub-section (1)(a) of section 11 of TRAI Act on specific services and/or bands.**

This issues with the approval of the Authority.

  
(Sudhit Gupta)  
Secretary, TRAI