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No. RP/ FY 14-15/ 081/ 033
Dated: 5th May, 2014

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Sub: Consultation Paper on Allocation and Pricing of Microwave Access (MWA) and Microwave Backbone (MWB) RF carriers

Ref: TRAI Consultation Paper No. 02/2014, dated 28th March 2014

Dear Sir,

This is with reference to your above mentioned Consultation Paper. In this regard, please find enclosed our response for your kind consideration.

Thanking you.
Yours Sincerely
For Bharti Airtel Limited

Ravi P. Gandhi
Chief Regulatory Officer (Policy)

Encl : As Above

Bharti Airtel's Response to TRAI's Consultation paper on "Allocation and Pricing of Microwave Access (MWA) and Microwave Backbone (MWB) RF carriers"

Brief:

The cellular operators including Airtel are paying for microwave access and backbone carriers as percentage of AGR defined by DoT order dated 18th April, 2002. The rates defined in the letter are as below:

a. **Microwave Access:**
   The spectrum charges for microwave access networks (normally in the frequency band 10 GHz and beyond) would be as given below:
   - for spectrum bandwidth upto 112 MHz in any of the circles, or 224 MHz in any of the 4 metros, spectrum charges shall be levied @ 0.25% of AGR per annum; and
   - for every additional 28 MHz or part thereof (if justified and assigned) in circles or 56 MHz or part thereof in any of 4 metros areas, additional spectrum charges shall be levied @ 0.05% of AGR per annum.

b. **Microwave Backbone:**
   The spectrum charges for microwave backbone networks to provide connectivity in the circle including spur routes, (generally below 10 GHz frequency band) would be as given below:
   - for spectrum bandwidth upto 56 MHz, spectrum charges shall be levied @ 0.10% of AGR per annum; and
   - for every additional 28 MHz or part thereof (if justified and assigned) additional spectrum charges shall be levied @ 0.05% of AGR per annum.

The above package of spectrum charging on percentage revenue share was made available to the cellular operators on the premise that it is accepted in its entirety and simultaneously all legal proceedings, with regard to spectrum charging, instituted by them or COAI against the Government in Courts and Tribunals (TDSAT) etc. shall be withdrawn. The cellular operators accepted the proposal and have been paying at the above rates since 2002.

Subsequently, DoT revised the charges for MWA and MWB unilaterally vide letters dated 3rd Nov, 2006 and 10th Nov, 2008. The revised rates for MWA/ MWB are as below:

Spectrum Bandwidth	**Spectrum charges as percentage of AGR**	**Cumulative spectrum charge as percentage of AGR**
First carrier of 28 MHz (paired)	0.15%	0.15%
Second carrier of 28 MHz (paired)	0.20%	0.35%
Third carrier of 28 MHz (paired)	0.20%	0.55%
Fourth carrier of 28 MHz (paired)	0.25%	0.80%
Fifth carrier of 28 MHz (paired)	0.30%	1.10%
Sixth carrier of 28 MHz (paired)	0.35%	1.45%
Seventh carrier of 28 MHz (paired)	0.40%	1.85%

Eighth carrier of 28 MHz (paired)	0.45%	2.30%
Ninth carrier of 28 MHz (paired)	0.50%	2.80%
Tenth carrier of 28 MHz (paired)	0.55%	3.35%
Eleventh carrier of 28 MHz (paired)	0.60%	3.95%

The above revised rates were challenged by the COAI and the cellular operators in Hon'ble TDSAT. The Hon'ble TDSAT set aside the above spectrum charging orders and the matter is now in Hon'ble Supreme court. In effect, we are governed by the 2002 rates as the same remains to be effective and in operation.

Besides, it is also pertinent to mention that MWA/ MWB carriers is only a supporting infrastructure for mobile backhaul and should be made available as cheap as possible to facilitate cost effective spread of mobile services. This is only a tool to facilitate the TSP to use the radio access network and spectrum efficiently thereby increasing revenue and hence the license fees & spectrum usage charges to government.

Hence, it is submitted that the charges and allocation criteria as enunciated in the letter dated 18th April, 2002 for **the microwave bands presently being allocated** should be continued till final adjunction in the Supreme Court and there is no need to review the same at this stage. Anything to the contrary would tantamount to interfering with a sub-judice proceedings and the existing agreed contracts between the DoT and the operators.

The submission made herein may also be considered without prejudice to our rights and contentions in the extension of licenses matter presently pending in the Supreme Court.

The response to the questions raised in the consultation paper is keeping in view the above and without prejudice to our rights and contention in the pending proceedings.

Q1. How many total Microwave access & Backbone Carrier should be assigned to a TSP deploying:

a. 2G technology only
b. 3G technology only
c. BWA technology only
d. Both 2G and 3G technologies
e. 2G and BWA technologies
f. 2G, 3G and BWA technologies

Bharti Airtel's Response:

Microwave Access (MWA) Carriers:

The MWA carriers that shall be assigned to a TSP are recommended as per table below.

Service	Metro & A Circle	B & C Circle
2G technology only	4	3
3G technology only	5	4
BWA technology only	8	6
Both 2G + 3G technologies	6	4
2G + BWA technologies	9	7
2G+3G+ BWA technologies	10	8

The above recommendation takes into consideration the practical aspects related to multiple parameters that impact MWA requirements and the objective to ensure optimum level of Microwave Access resources that can provide speed and sustainability for growth and evolution of mobile data and services in India. The microwave backhaul remains the principle enabler, considering huge challenges around infrastructure, fiber build feasibility and its cost.

It may be noted that MWA carriers requirement for Category B & C is recommended to be clubbed in one category as almost equal data usage growth has been observed in category B (35%) & C circles (32%) as mentioned in TRAI consultation paper.

While the present subscriber base, access technology deployed, amount of radio access spectrum allocated to the TSP are fundamental drivers to MWA required, there are many other practical parameters that influence the number of microwave access carriers required by a TSP. These include

i. Backhaul capacity required per site
ii. Mobile Network Density
iii. Fiber penetration
iv. Hub density
v. Microwave link capacity
vi. Evolution of existing network
i. Suboptimal angular separations
ii. Line Of Sight
iii. Infrastructure limitations

As mobile networks are in continuous evolution stage, most of these parameters cannot be evaluated on a static ground. The required capacity per site, mobile networks density and infrastructural limitations are continuously on increase. The impact of these cannot be measured in absolute terms and can be only experienced & empirically compared.

Some of these aspects and parameters are discussed in the section below:

a) **Capacity per Site:**

Mobile networks are evolving fast from being only 2G, 3G only to multi-carrier and multi-technology. Heterogeneous radio access networks increases the RAN capacities significantly. Mobile data usage is already doubling Y-o-Y. In future, even more Radio

Access Spectrum might be allocated. This will require multifold capacity upgrades in the backhaul network to support evolution of heterogeneous RAN networks.

Capacity per site vary with type of services offered. The requirement of capacity per site has a significant implications for microwave which has link capacity of 180-200 mbps only. So number of hops in microwave chain/ ring drop drastically with the 3G or BWA network as compared to 2G network. In practice, due to very high capacity per site requirement in case of a 2G+3G+BWA network, single hop star topology is the only practical option, thereby directly impacting the number of carriers required.

Further it must be noted, that capacity requirements per site may scale to 300 mbps+ in future with technical advancements in RAN coupled with additional spectrum allocations. This shall require multi carrier implementations even in star topology. This aspect is not considered today in microwave carrier recommendations.

Type of Service	**Backhaul capacity in Mbps**	**Typical value in Mbps**
2G	4-8 mbps	6 mbps
3G	24-60 mbps	30 mbps
BWA	60 - 240 mbps	100 mbps
Additional spectrum carriers 1800 MHz	40 - 100 mbps	40/80 mbps depending on spectrum

b) Higher site Density due to 2G@1800 MHz, 3G/ UMTS @ 2100 MHz & 4G/ LTE@ 2300 MHz with less inter-site distance:

Mobile network density refers to the number of sites in a geographical area. Higher network density leads to higher number of microwave hops deployment per unit area. To cover same geographical area different number of cell sites are required depending on RAN spectrum, technology & clutter to have effective coverage. Typically, the relative variation observed for cell site radius in cities is :

- B & C category circle is 1 : 1.2 : 1.6 for 2G, 3G & BWA network
- Metro & A category circle is 1.4 : 2 : 2.5 for 2G, 3G & BWA network.

In order to have coverage similar to 2G, a BWA network requires much higher density of mobile network sites. Higher network density means smaller inter-site distances, which makes it more difficult to reuse the limited number of microwave channels at maximum bandwidth at adjacent/near site locations. The microwave network becomes more prone to far end interference.

c) **Number of Links per MW carrier:**

Although technically 4 links per MW carrier can be originated from one site but due to practical scenario on ground such as suboptimal angular separation, Line of Sight (LoS) limitations, uneven site distribution and geographical restrictions on hub sites etc. achieving for all available carriers is not possible. Considering the practical experience, and continuously increasing network density, the average number of links per MW carrier on a hub site ~ 2 only.

d) **Fiber Penetration:**

Number of fiber pops in the network directly impacts the number of hub locations in network. Limited fiber means higher number of microwave links originating from one hub site. Higher number of links originating from one site, will require higher number of microwave carriers to maintain threshold degradation less than 3 db & availability of 99.999%.

In India the wireless networks are still in expansion stage with number of sites consistently growing to meet capacity or coverage needs. Fiber rollout being expensive and a slow process, cannot be expanded at the pace of wireless networks. Moreover extremely high RoW charges and poor feasibility in dense urban areas leaves microwave as only dependable option.

e) Topology to support high Bandwidth for 2G, 3G & LTE N/W:

Supporting higher Bandwidth of 100-180 Mbps per site is not possible Ring M/W Network topology and the architecture has to be modified to **Star configuration.**

In the star configuration, all transmitters on the common node should have the same duplex half (L), hence frequency planning is difficult and very sensitive to the geometry (mutual angles). If the node is a concentration point for high-capacity links, wide bandwidth is required, thus making the allocation of smaller channels in other portions of topology becomes extremely challenging and difficult.

Also in a Hub site, where Fiber is not available, it is recommended that the link carrying the traffic out of the hub should use a frequency band other than the one employed inside. Hence, more Microwave carriers are required.

f) **Pre-aggregation network deployment is on Microwave:**

Due to Low penetration of fiber, up to 95% of network – Access & pre Aggregation is planned on Microwave. This forces high microwave carriers reuse in nearby hops. This creates high near end and far end interference problems in network. To avoid this, additional microwave carriers are required.

g) **High Microwave Link density originating from one Fiber node / MW Hub:**

Due to low penetration of fiber, the microwave network is highly concentrated on few critical fibered node/ microwave Hub sites. Most of the links need to be planned in very narrow angular separation to each other, which creates high near end interference. Also, with the microwave hops radiating on complete 28MHz to achieve maximum bandwidth per hop, the microwave network is becoming more and more susceptible to near end interference. To avoid this, high number of microwave carriers are required. There are 5% to 8% sites with 10-14 microwave links originating from single Hub site.

h) **Maintaining microwave network availability @ 99.999% and robust network with minimum interference:**

Modulation schemes up to 1024 QAM are supported by latest microwave, but higher modulations require much higher C/I-values and hence are more susceptible to near end as well as far end interference. It is extremely difficult to maintain network availability of microwave access transport network as per designed criteria. So, to implement high QAM microwave needs more MWA carriers.

i) **Poor feasibility of Next generation technologies**:

MIMO & XPIC, Radio Link bonding etc. are the Next generation technologies available in microwave which can enhance the bandwidth per hop 500Mbps from the currently available 200Mbps. While on one side these technologies claim to provide for much needed capacity but on the other side have poor interference tolerance and need exclusive carriers. In any site location if 2 such hops are implemented then minimum 4 channels are required. Hence, the microwave carrier requirement goes up substantially.

j) **Tough terrain and hilly circles with extremely low fiber penetration:**

Circles like Jammu & Kashmir, North East, Assam, West Bengal and Himachal Pradesh have tough terrain due to which laying fiber is a challenge and hence, the fiber penetration is very low. Networks are highly dependent on microwave spectrum to offer services like 3G & LTE. Due to hilly terrain and climatic effect, the opportunity to effectively utilize the spectrum through higher modulation (256/512 QAM) is limited. Hence, more number of microwave carriers is the only way out to meet bandwidth requirement in microwave transport network.

k) **High Capex required to upgrade Legacy microwave deployed with low capacity capabilities:**

For existing TSPs, up gradation of huge legacy microwave network which has lower QAM support capabilities to achieve high capacity is a very big challenge as this requires very high Capex. Due to these legacy limitations, more number of microwave hops needs to be implemented which in turn increases near end and far end interference issues. To avoid this, more number of microwave carriers are required.

l) **Shortage of Infra availability in Metro's / Dense areas of Circles :**

Due to sharing of tower infrastructure, desired height for LoS clearance is difficult to achieve. Also high rise structures in the vicinity makes it more difficult to achieve clear LoS, which further lead to concentration of microwave antennas at the tower top, leading to more near end interference and requirement of more microwave carriers.

An example of relative variation of multiple aspects related to type of service is given below considering Metro & A circle.

S.No.	Parameter	2G	2G+3G	2G+BWA	2G+3G+BWA
1	Backhaul capacity required per site	6 Mbps	36 Mbps	106 Mbps	136 Mbps
2	Mobile Network Density	Medium	High	Very High	Very High
3	Fiber penetration required	Low	Medium	High	High
4	Hub density	Medium	High	Very High	Very High
5	No of Sites parented at one fiber / Hub site	26-32	20-24	12-18	12-18
6	Topology	Ring + Chain	Ring + Chain	Star	Star
7	Ring Size	8-12	4	0	0
8	Chain Length	2-3	2-3	1.2	1
9	No of MW Links originating per Fiber/Hub site	8-9	11-12	10-15	12-18
10	MWA Carriers required (2 Links / Carrier Per Site)	4	6	9	10

It may kindly be noted that the above example is indicative of the relative variation of the requirement of microwave access carriers under different scenario. However, there may even be a requirement of additional carriers other than what has been mentioned above depending upon the increase in backhaul capacity, network density etc.

Microwave Backbone (MWB) Carriers:

At present, the assignment of microwave backbone carriers is done on a case by case and link by link basis, considering full justification of the requirements and availability of spectrum.

It is recommended that the present allocation methodology in respect of microwave backbone links may be continued in future.

Q2. How many MWA/MWB Carriers needs to be assigned to TSPs in case of 2G, 3G & BWA at the start of their services (i.e. Beginning of rolling of services) Please justify your answer

Bharti Airtel's Response:

Microwave Access (MWA) Carriers:

The key factor that differentiate a new TSP from existing TSP are:

a) Benefit of latest equipment – Higher QAM, Compression, interference control techniques and advanced antenna can be used.
b) Lower initial subscriber base and low network density.
c) No legacy microwave & RAN equipment to carry. For example new 2G services can be implemented with AbiS over IP and sharing effective microwave capacities.

It is therefore recommended that the new TSPs can be allocated microwave access carriers basis the recommendations of the DoT Committee report dated 7th Oct, 2011 as indicated below:

Service	Metro & A Circle	B Circle	C Circle	Remarks
2G	3-4	2-3	2	
3G	One additional RF pair in each category compared to 2G			
BWA	4-6	3-4	3	This is requirement for a standalone BWA operator as well as for an operator having 2G and 3G services in a service area.

It may kindly be noted that the above requirement is only limited to a start-up operator. The operator that has a deployed network will require additional microwave access carriers to meet the requirement depending upon the subscriber base, access technology deployed, amount of radio access spectrum allocated to the TSP etc. The response to Q1 may be referred to in case of an existing TSP.

Microwave Backbone (MWB) Carriers:

The assignment of microwave backbone carriers is done on a case by case and link by link basis, considering full justification of the requirements and availability of spectrum and the same may be continued with in case of a new TSP as well.

Q3. Should excess spectrum be withdrawn from existing TSPs?
&
Q4. If yes, what should be the criteria for withdrawal of excess allocation of MWA and MWB carriers, if any, allocated to the existing service providers?

Bharti Airtel's Response:

- The existing MWA carrier allocation to TSPs has been done after proper justifications and as per applicable guidelines at the time.

- Huge rollouts have been carried out by TSPs on allocated carriers (~ 7 lac+ microwave links pan India). Any withdrawal shall result in large scale network changes, wastage of deployed resources and even further investment will be required.
- The allocated MWA carriers should be seen from long term network and services evolution perspective considering the RAN spectrum acquired by the TSP.
- The allocated microwave carriers are being paid for as additional percentage of AGR and there is no incentive for any operator to hoard excess microwave carriers.

Moreover, only 810 microwave carriers have been allocated to the existing TSPs out of the available 2190 carriers and 1280 microwave access carriers are available with DoT. Thus, there is no immediate case for withdrawal of microwave access carriers from the existing TSPs. It is therefore recommended that the future allocations of microwave access carriers to the existing as well as new TSPs should be governed based on justified requirements and as per the criteria.

Q5. What should be the preferred basis of assignment of MWA/MWB carriers to the TSPs i.e. 'exclusive basis assignment' or 'link-to-link based assignment'?

Bharti Airtel's Response:

Microwave Access Carriers:

- Considering the prevailing arrangement and large scale deployments required in case of microwave access carriers, Link by Link assignment is not a feasible or practical option today for already allocated bands (13GHz/15GHz/18GHz/21GHz). It is therefore recommended that new carrier allocation in these bands should continue to be on Exclusive basis.
- The allocation for new MWA bands (26GHz/28GHz/38GHz/42GHz) can be done on link by link basis under full regulation of WPC.

Microwave Backbone Carriers:

The assignment of microwave backbone carriers is presently done on a case by case and link by link basis and the same should be continued with in future.

Q6. In case 'exclusive basis' assignment is preferred, whether MWA and MWB carriers should be assigned administratively or through auction. Please comment with full justifications.

Bharti Airtel's Response:

It is recommended that the assignment of microwave access carriers be done exclusively and administratively due to the following reasons:

- Microwave access carriers are only a supporting infra resource for already auctioned Radio Access spectrum (2G, 3G & LTE) and should therefore be given basis justified requirement.
- Moreover, only 810 microwave carriers have been allocated to the existing TSPs out of the available 2190 carriers and 1280 microwave access carriers are available with DoT.

Therefore, administrative assignment of microwave access carriers on exclusive basis is recommended.

Q7. In case 'link-to-link basis' assignment is preferred, how the carrier assignment for different links should be carried out, particularly in nearby locations?

Bharti Airtel's Response:

Link by link assignment is only recommended for Microwave Backbone carriers. The assignment of microwave backbone carriers presently done on a case by case and link by link basis, considering full justification of the requirements and availability of spectrum and the same may be continued with in future.

Q8. Considering the fact that different TSPs may require additional carriers at different point of time, what should be the assignment criteria for allocation of additional carriers for MWA and MWB?

Bharti Airtel's Response:

Microwave Access Carrier:

Allocation of microwave access carriers should be in line with response to Q1. Due validation of TSP demand can be evaluated basis deployed network size in terms of cell site density, loading of existing carriers, radio access spectrum acquired, services offered, existing subscriber base etc. to ensure that carriers already taken by TSP are efficiently utilized.

Microwave Backbone Carrier:

The assignment of microwave backbone carriers should continue to be on link by link basis post considering full justification and availability of spectrum

Q9. How can it be ensured that spectrum carriers assigned are used optimally and the TSPs are encouraged to move towards the OFC?

Bharti Airtel's Response:

- Fiber Right of Way (RoW) permissions are presently regulated by multiple local agencies today and there is huge variations in cost making fiber laying extremely expensive or non-

viable in many urban areas. It is requested that the fiber be treated as resource of national importance and there should be uniform governing guidelines from DoT on the subject to facilitate fast clearances and reasonable RoW charges across Pan-India. This will enable and incentivize the TSPs to roll out fiber in every nook and corner.

- It is also important to mention that with the deployment and uptake of mobile broadband services, the requirement for backhaul capacity will increase tremendously. Therefore, TSPs will be required to roll out fiber consistently and they will continue to do so wherever economically justified and feasible. Fiber roll out beyond such sites will unnecessarily add cost to the network and end-user cost. Significant incentives will be required to counter this cost and shall vary from circle to circle depending upon the fiber laying costs.
- It is also pertinent to mention that the prevailing spectrum charges for microwave access and backbone carriers are already high enough to force TSP to use the microwave access/ backbone carriers efficiently. However, minimum carrier loading criteria in terms of BTS/carrier or subscriber /carrier with time limit can be defined as an allocation obligation to rule out underutilization. Relevant data can be submitted to DoT once or twice a calendar year to ensure efficient and optimum utilization of allocated microwave carriers.

Q10. Should an upfront charge be levied on the assignment of MWA or MWB carriers, apart from the annual spectrum charges?

Bharti Airtel's Response:

Microwave is only a supporting infrastructure for mobile backhaul and should be made available as cheap as possible to facilitate cost effective spread of mobile services. This is only a tool to facilitate the TSP to use the radio access network and spectrum efficiently thereby increasing revenue and hence the license fees & spectrum usage charges to govt. There is no need for any upfront charge

Q11. What should be the pricing mechanism for MWA and MWB carriers? Should the annual spectrum charges be levied as a percentage of AGR or on link-by-link basis or a combination of the two?

&

Q12. In case of percentage AGR based pricing, is there any need to change the existing slabs prescribed by the DoT in 2006 and 2008? Please justify your answer.

Bharti Airtel's Response:

A. Pricing Mechanism for presently assigned bands , i.e. 6 MHz/ 7MHz/ 13 MHz/ 15 MHz/ 18MHz/ 21 MHz:

a) For the allocation of microwave links in the presently allocated bands, i.e. 6 MHz/ 7MHz/ 13 MHz/ 15 MHz/ 18MHz/ 21 MHz, **the pricing should continue to be on the basis of percentage of AGR as per DoT order dated 18th April, 2002** for the present as well as future allocations.

b) It is further submitted that the percentage of AGR as prescribed by DoT in 2006 and 2008 are quite high and does not take into account the fact that MWA/MWB carriers

is only a supporting infrastructure for mobile backhaul and should be made available as cheap as possible to facilitate cost effective spread of mobile services. This is only a tool to facilitate the TSP to use the radio access network and spectrum efficiently thereby increasing revenue and hence the license fees & spectrum usage charges to government.

c) The charging of microwave carriers on an AGR basis which increases with the increase in number of carriers also incentivize the operators to opt for the least number of microwave carriers that are required for running the network. No operator would want to hoard an excess spectrum and pay an extra percentage of AGR without having a proper need for that microwave carrier.

d) Huge rollouts have been carried out by TSPs on allocated carriers (~ 7 lac+ microwave links pan India). Any change in charging methodology from the present AGR basis per carrier to a link by link basis may pose a lot of operational and administrative difficulty.

It is therefore recommended that the for the allocation of microwave links in the presently allocated bands, i.e. 6 MHz/ 7MHz/ 13 MHz/ 15 MHz/ 18MHz/ 21 MHz**, the pricing should continue to be on the basis of percentage of AGR as per DoT order dated 18th April, 2002** for the present as well as future allocations.

B. <u>Pricing Mechanism for spectrum bands to be explored and opened in future, i.e. 10 MHz/ 11 MHz/ 26 MHz/ 28 MHz/ 32MHz/ 38 MHz/ 42 MHz:</u>

a) For new bands, that the DoT intends to explore and open in future for allocation of microwave carriers, the charging/ pricing of the same may be explored on a link by link basis.

b) The parameters and the method of charging is explained in response to Q13.

Q13. In case link-by-link based charging mechanism is adopted then:
(a) Should the spectrum be priced differently for different MW spectrum bands (6GHz/7GHz/13GHz/15GHz/18GHz/21 GHz/26 GHz/28GHz/32GHz/42 GHz etc)? If yes, by what formula should these be charged?
(b) What are the factors (viz as mentioned in para 3.22), that should appear in the formula? Please elaborate each and every factor suggested.

<u>Bharti Airtel's Response:</u>

Although Link by Link assignment is not recommended for already allocated bands as detailed in response to Q11 & 12. However, the allocation of microwave in other bands may be done on a link by link basis to enable fair charging and effective usage of allocated resources.

It is proposed to keep charging simple (for example given formula for UAE ref page 165 of Consultation paper No. 02/2014)

Q14. Should the option of assignment of MWA carriers in all the spectrum bands in 6-42 GHz range be explored in line with other countries? What are the likely issues in its assignment MWA carriers in these additional spectrum bands?

Bharti Airtel's Response:

Yes, the option of assigning MWA carriers in all spectrum bands in 6-42 GHz can be explored in line with the other countries. This will result in availability of more MWA carriers. Further it is recommended to increase carrier bandwidth to 2x56 MHz per channel to support higher bandwidth required for high capacity Radio access networks (RAN.) This will also and this will reduce demand for exclusive MWA carriers in existing bands.

Q15. In your opinion, what is the appropriate time for considering assignment of MWA carriers in higher frequency bands viz. E-band and V-band?

Bharti Airtel's Response:

a) E- band & V- band are already in use across multiple countries and it is right time to allocate the same in India as well. It is pertinent to mention that allocation of microwave carriers is E/ V band is not a substitute for allocation of MWA carriers in the presently allocated band. This is primarily on account of the very short distances to the tune of a Km for which E/V Band connectivity can be utilized. The bands should therefore be allocated under a separate category i.e. Microwave - Very Short Haul (MWVSH) as the use of these bands is limited by their propagation characteristics.
b) Considering different charges around fiber roll out in different geographies/ cities and the difficulty in fiber layout in dense areas, these high frequency bands are expected to compliment fiber roll out and extend its reach in last mile although over very short distances. High sensitivity of this band to rain attenuation, limits the practical ranges of equipment operating in this technology, and actual implementation only will speak out the scale of success under heavy rain or monsoon scenarios.
c) It is also proposed that V band allocation be divided in two exclusive categories:
    - First, for front haul (Wifi) & Enterprise applications and;
    - Second, for TSPs RAN backhaul so that band can be used for telecom applications with some degree of reliability so that coordination, if required, is among TSPs only.

Q16. Should E-band be fully regulated or there should be light touch regulations?

Bharti Airtel's Response:

Carrier grade implementation of E band is of utmost importance for it to be a successful telecom technology. Whatever it takes to make it reliable carrier grade technology under dense environment should be implemented, preferable it should be link by link assignment "fully regulated"

Q17. What charging/pricing mechanism would be appropriate for these bands?

Bharti Airtel's Response:

Nominal link by link charging should be adopted for microwave carrier assignment in E band and V band.

Q18. Apart from Q1-Q17, stakeholders are requested to bring out any other issue, which needs to be examined, with justification

Bharti Airtel's Response:

No comments