Counter Comments on
TRAI Consultation Paper on
"Proliferation of Broadband through Public Wi-Fi Networks"

1. At the outset we would like to reiterate that we welcome the initiative of the Authority to enable the spread of Broadband in the country. But the spread of Broadband in the country must be enabled through steps which conform to Indian Telegraph Act and follow licensing and Regulatory Structure of India which have been devised considering interest and security of the nation and citizens. It would not be out of place to mention again some of the submissions that we have made in our response to the Consultation Paper.

   a. **Scope of WiFi-Technology**: Wi-Fi Technology was conceived in order to enable users to communicate over a short range or for indoor communication either through direct Device to Device Communication or by creation of WLAN over an unlicensed spectrum band.

      Over time, Wi-Fi technology was also used for accessing internet as well (by connecting the Wireless access point to the internet gateway at a particular place) to serve the restricted group of users.

      The purpose of assigning unlicensed bands for Wi-Fi was to enable communication between devices for indoor communication or over a short range and not on a city-wide basis. On the other hand, cellular networks were conceived and deployed as Public Networks i.e. Public Land Mobile Network (PLMN) for providing voice and internet access to the masses on a commercial scale on city-wide or LSA basis.

   b. **Notion of "Wi-Fi Service Providers":** In the current Licensing Regime, Internet Access can be provided only by Licensed Service Providers i.e. TSPs or ISPs having their own networks to extend last mile access. In line with the same, only licensed TSPs and ISPs can provide internet access through Wi-Fi Technology (just like any other access technology) either directly or by following business models which are complaint to the Licensing Regime as already elaborated in our response to the Consultation Paper. **Thus, there is no separate category of Wi-Fi Service Providers in the licensing regime and Internet Access can be provided only by Licensed Service Providers i.e. TSP and ISPs.**

In the backdrop of our above submissions, we would further like to make the following submissions on the comments of certain stakeholders on Consultation Paper.

2. Some of the stakeholders have stated that the customers should be allowed to install repeaters

a. It is first submitted that such a proposal seeks to convert a consumer into a telecom operator and offer commercial services. Such a proposal fails to appreciate that any telecom activity [even if it uses de-licensed spectrum] requires a license under the Telegraph Act.

b. Also, as submitted earlier, the purpose of Wi-Fi technology is to enable a short-range or indoor communication. This was the very reason for assigning unlicensed bands for Wi-Fi. Thus, there is no case for allowing the installation of repeaters by customers for extending the Wi-Fi coverage.

c. The long range coverage is meant to be provided by cellular networks for providing city-wide coverage on licensed spectrum.

d. Further, Cellular Telephone Industry has been drawing the attention of Authorities by voicing its concerns regarding the installation of various illegal repeaters by some entities which have been adversely affecting quality of mobile services by causing interference.

e. Therefore, we sincerely submit that there is no case for allowing the installation of repeaters for Wi-Fi as Wi-Fi technology is meant for short-range or indoor communication only and to avoid interference from these repeaters which may hamper the quality of mobile services by causing interference.

3. Some stakeholders have suggested that aggregators should be introduced for Wi-Fi Service

a. As stated earlier that in the current licensing Regime, only Licensed TSPs and ISPs having their own networks are authorized for providing internet access through various technologies including Wi-Fi.

b. Despite all the challenges, the growth of mobile tele-density in the country has been phenomenal. The orderly growth of the telecom industry has been enabled through consistent investments by operators in their telecom infrastructure and retail network. We sincerely believe that the same can be followed for the Wi-Fi services as well. Further, we have already submitted in our response that any reselling of data can happen only through VNO route, for which, the framework has already been laid down.

c. Therefore, there is no case of introduction of any sort of aggregators for Wi-Fi Service, certainly not by regulatory mandate. Such arrangements, if at all feasible, should be left to market forces and mutual commercial agreements.

d. With respect to Hub based model suggested by some stakeholders, we would like to submit that the same is not required as it adds to costs and complexity to the system. Hence there should be no regulatory mandate in this regard and the evolution of Wi-Fi services should left to market forces just like other technologies such as Cellular

Technology. The same would lead to the adoption of most efficient solutions which are technically feasible.

4. Some stakeholders have stated that there are significant white spaces available in India and that TVWS spectrum should be delicensed

a. In this regard, we would like to submit that TV White Spaces refer to the unused TV channels between the active ones in the broadcasting spectrum, typically referred to as the “buffer” channels. In the past, these buffers were placed between active TV channels to protect broadcasting interference. These can also be due to channels becoming available while converting analog broadcasting to digital. Typically white spaces, or “TV white spaces,” consist of unused spectrum in the television broadcasting bands (470-790 MHz in Europe and 470-698 MHz in USA). There is unused spectrum mainly because of the geographical separation required between television stations of the same channel and also part of the spectrum dedicated to the regional TV stations which remain unused in certain areas.

b. We believe that in the case of India, the term TV White Spaces is a misnomer. This is because, while other countries have multiple broadcasters, giving rise to genuine white space availability, we effectively have only one public broadcaster viz. Doordarshan here and hence; most of this spectrum is vacant or empty in India. It is for this reason, it would be inappropriate to use the term 'white space' for India. Rather, it is right to refer to it here as the regular TV UHF Band. These unused (vacant) spectrum blocks are similar to any other “newly auctioned” spectrum bands.

c. Further, in this regard, we submit that DoT has also clarified to us that it will not be delicensed and any decision regarding methodology of allocation and pricing shall be taken by the Government.

d. We also submit that unlicensed spectrum does not guarantee exclusivity and therefore, there is no coordination between operators/users using this spectrum. Hence, other than managing interference from adjacent access points (the equivalent of towers), managing interference from users of other operator's network also assumes paramount importance**.** Since, at higher frequencies, the RF signals tend to attenuate faster as compared to those at lower frequencies, usually the operators/users are mandated to transmit at much lower power as compared to their licensed counterparts (4 watts ERP vs 20 watts ERP) so that multiple networks can coexist in the same frequency band very close to each other. However, uncoordinated use makes it impossible to eliminate the possibility of interference and hence, the technologies using unlicensed spectrum uses frequency hopping techniques and dynamically choose a block of spectrum (among multiple) with least interference. Thus in order to enable reasonable data rates, an unlicensed operation needs much larger quantum of spectrum compared to its licensed counterpart (typically a block of 100/200 MHz) of which only a fraction (20/40 MHz) is used at a time. This is also the reason why lower frequencies (less than 1 GHz) are not good for unlicensed operations as it is difficult to find such large blocks of spectrum at these frequencies. Also, RF signals (even at lower power levels) in the sub-GHz frequency tend to travel far causing severe interference to uncoordinated networks operating nearby.

e. Other challenges are that it cannot be used for ubiquitous coverage and there is no guarantee on SLAs. The threat of interference from unlicensed spectrum assignments forces one to over-design the network with a large number of access points (e.g. for a cricket stadium it could be as high as 500 to 700 APs). This also significantly increases the number of backhaul access points compared to networks running on licensed spectrum.

5. Some stakeholders have stated that TVWS is a cost efficient solution, which is easy to set up and maintain

a. It is submitted that TVWS requires proprietary hardware & software and also the Consumer devices to support TVWS (802.11af and 802.22), which are not available at present. To be able to have a harmonious sharing of resources dynamically between multiple operators and users would need the availability of highly complex technologies viz. Software Defined Network Control, Cognitive Radios, and writing of complex algorithms. None of these technologies are commercialized as of now, even in developed countries where trials have been going on for far longer periods than in India. The use of such technologies would make the network cost prohibitively expensive.

b. The assumptions made by them to call it cost efficient in itself are fallacious and are given below:

i. That spectrum (TV UHF band) will be unlicensed and hence 'free' for use in the rural areas and that most of the spectrum in the TV UHF band -Band IV completely (470-590MHz) and also parts of Band V (590-698MHz) will be made available and permitted for use in the rural areas, thereby making a large chunk of spectrum available for contiguous use. This assumption would obviate the need to have a Cognitive Radio and even a database assisted approach, thereby saving on the network costs drastically.

ii. That the Wi-Fi devices to the end users in the villages will also be subsidized/ provided free by the Government.

iii. The cost of the customized prototype BTS which uses 802.11g (Wi-Fi) with RF of 500Mhz and a Wi-Fi Access Point (AP) with special RF interface card and proprietary software to access White Space shall serve as the Price benchmark for Base Stations in India.

All these assumptions seem to be overly optimistic and highly impractical to form the basis of a viable business case for broadband in rural areas.

6. Some stakeholders have suggested Authentication methods for Wi-Fi services

a. The current system of authentication for Wi-Fi hotspots have been adopted by DoT after consulting with Ministry of Home affairs. We believe that OTP based logins are sufficiently convenient for people to attach to the Wi-Fi network and the same may be continued.

b. Therefore, we sincerely believe that there is no need for the introduction of new authentication mechanism for access to Wi-Fi services.

c. However, if Authority still feels the requirement for the introduction of new authentication mechanism for the ease of access to Wi-Fi services then the same can be introduced after consulting the Ministry of Home Affairs if the same conforms to the security requirements/standards to ensure the safety of the nation and citizens.

7. Use of USOF Subsidy for provision of Wi-Fi Services

a. For any allocation of USO Fund, as suggested by some stakeholders, for the provision of Wi-Fi hotspots in the remote areas, the well-defined process of floating of the tender should be followed. This would ensure all the competent parties get a fair chance to participate in the process and would thus ensure transparency in the complete process.

8. Some Stakeholders have suggested that there should be no SUC on Wi-Fi services

a. We agree to the views expressed by some stakeholders in their submissions that SUC should not be applicable on Wi-Fi services. The same is clear from the Recommendation of TRAI on Definition of AGR and definition of Access spectrum by DoT.

b. Further, we would like to submit that in order to avoid double taxation, the treatment of payment made between TSPs for Wi-Fi services should be allowed as a pass through.

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