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Date: 24th August 2016

To,

Shri Arvind Kumar,
Advisor (Broadband & Policy Analysis)
Telecom Regulatory Authority of India
Mahanagar Doorsanchar Bhawan
J.L. Nehru Marg, Old Minto Road
New Delhi - 110002

Subject: Consultation Paper on Proliferation of Broadband through Public Wi-Fi Networks

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

A handwritten signature in blue ink, appearing to read 'R. Gandhi', with a horizontal line extending to the right.

Ravi P. Gandhi
Chief Regulatory Officer

Bharti Airtel Limited's Response to TRAI Consultation Paper on "Proliferation of Broadband through Public Wifi Networks"

At the outset, we thank the Hon'ble Authority for providing us an opportunity to submit our views on this consultation paper.

While the ambition to create a 'Digital India' through affordable and reliable broadband-on-demand is laudable; we must also recognize that this dream faces immense challenges. Thus, policy makers need to provide an enabling environment for increasing Internet/broadband penetration including Wifi.

We believe that the current licensing framework is largely conducive for the proliferation & expansion of Wifi services as it allows both technical and commercial interoperability between the telecom operators. However, the major hindrance is getting permissions for Right of way (RoW) for laying fiber/ cable, which is critical for building backhaul connectivity. A national Right of Way (RoW) policy is a need of the hour and is required as an enabler for speedy and effective deployment of Wifi network. Other issues which need consideration are sharing of public infrastructure, uninterrupted supply of power and ensuring safety and security of Wifi infrastructure. The Government need to address these bottlenecks on urgent basis to promote Wifi.

The Wifi technology was conceived to fulfil the requirement for short range wireless communication either directly between the devices or by creating a WLAN for personal or closed groups. Over time, Wifi technology has also been used for accessing Internet to serve the restricted group of users. Thus, the purpose of designating unlicensed bands for Wifi was to enable communication between devices for indoor communication or over a short range and not on a city-wide basis. Wifi cannot be deployed to provide ubiquitous coverage due to its inherent technical limitations. Cellular operators on the other hand offer high quality Internet and Broadband services in wider areas but may not always cover indoor locations well. Wifi, therefore, supplements the cellular network in filling these indoor gaps on complementary basis at such locations.

In the current licensing regime, Internet services in the country, through any access technology, be it Wi-Fi, Cellular networks or any wired technology, can be provided only by licensed telecom operators. Reselling of telecom services including Wifi services can only be done by a licensed operator. The end customer/ enterprise has a limited right to create Wifi hotspots only for its own usage and not for others. Therefore, an unlicensed entity cannot sell or share Wifi services with any entity/person, either directly or indirectly.

Significantly, in a market-driven economy, commercial freedom and engagement are critical for attracting investments, running a business and delivering a value proposition to end customers. Thus, the freedom to explore various commercial models, both as a stand-alone wifi network and as complementary Wifi network to cellular, is a key to the development of Wifi infrastructure across the country. Any regulatory intervention on this aspect would tantamount to curbing the flexibility of doing business and should be avoided.

In the above context, our views on the various questions raised by the Authority in the current consultation paper are as follows:-

Q1. Are there any regulatory issues, licensing restrictions or other factors that are hampering the growth of public Wifi services in the country?

Airtel's Response:

1. We believe that there are no licensing restrictions hampering the growth of Wifi services in the country.
2. The present licensing regime allows telecom operators to deploy Wifi hotspots in the delicensed bands. For this, telecom operators are required to deploy Access Points along with associated backhaul bandwidth. While, there is no challenge in the deployment of Access Points, but lack of timely RoW permissions with exorbitant charges limit the ability of telecom operators to connect these Access Points with sufficient backhaul bandwidth. In the absence of fiber connectivity, telecom operators have to rely on wireless backhaul which has inherent capacity constraints resulting in poor customer experience.
3. Thus, to promote Wifi services, there is a need for a national RoW policy which enables an operator to get permissions for laying fiber/cables promptly and at reasonable charges. A single window clearance for installation of tower, laying of fiber and creating infrastructure of Wifi hotspots is critical to overcome the difficulties being faced by operators in the deployment of Wifi network. Further, the Government should also consider permitting sharing of public infrastructure such as electricity poles, traffic light poles, telephone line poles, etc. We believe that an enabling policy framework for RoW related issues will go a long way in the proliferation of Wifi services.

Q2. What regulatory/licensing or policy measures are required to encourage the deployment of commercial models for ubiquitous city-wide Wifi networks as well as expansion of Wifi networks in remote or rural areas?

Airtel's Response:

1. Wifi as a technology is meant for coverage in indoor locations or small outdoor areas. This technology is therefore deployed on higher frequencies and at low power so that it can be used in a free and non-coordinated manner. Due to these limitations, Wifi can neither be used to build ubiquitous stand-alone city-wide Wifi networks nor for expansion of Wifi network in remote/rural areas.

2. However, Wifi as a technology is an invaluable complement/supplement to cellular network in the delivery of broadband services, particularly in indoor areas. Cellular operators offer high quality broadband services in widespread areas, but may not always cover indoor locations well. Wifi can fill these indoor gaps on complementary basis at such locations. Qualitative and quantitative analysis of some of the most advanced¹ markets reveals that the majority of today's Wifi traffic is incremental or complementary to cellular traffic.
3. We believe that once the issues related to RoW, as stated in our response to Q. No.1, are addressed, it would result into proliferation of Wifi services and will significantly improve the business case of Wifi services in India.
4. The cost of providing Wifi services can be brought down by way of enabling policies such as zero licence fee for Internet services, free RoW permissions, availability of uninterrupted power supply, permission to set up kiosks at select locations, ensuring safety and security of Wifi infrastructure, etc. Further, telecom operators may continue to have the flexibility to adopt and explore diverse business models to improve the viability of Wifi services.
5. It may also be noted that Wifi services have often been marketed and viewed as a free service whereas telecom operators incur huge costs in building and maintaining Wifi network. While customers are more than happy to use Wifi services as long as they are made available free of cost but they are not keen to pay for the same service once they cross the prescribed free limit. Thus, the myth of Wifi as a free service should also be dismantled to encourage more people to pay for Wifi services. This will significantly improve the business case of a stand-alone Wifi network.
6. In the consultation paper, TRAI has attempted to approximate the Wifi data cost. We believe that the costs and assumptions require validation. Since hotspot model would vary in each city/location and economies of scale would be different, the cost are bound to vary accordingly.

¹ <http://www.gsma.com/spectrum/wp-content/uploads/2014/05/Wifi-Offload-Paper.pdf>

Q3. What measures are required to encourage interoperability between the Wifi networks of different service providers, both within the country and internationally?

Q4. What measures are required to encourage interoperability between cellular and Wifi networks?

Airtel's Response:

1. As per the current licensing framework, Wifi services can only be provided by a UASL/CMTS/Unified Licence (Access Service Authorization) or ISP/Unified Licence (Internet Services Authorization).
2. We believe that the current licence provisions allow the technical interoperability of Wifi network for seamless Wifi connectivity and experience to end customers. The licence permits telecom operators to share their Wifi access points with each other and to offload cellular data traffic on Wifi access points. Roaming is also permitted between telecom operators. The recent direction on active infrastructure sharing among telecom operators is also a right step in this direction. Further telecom operators are also allowed to interconnect with other operators via Peering/Internet Ports directly. Therefore, we do not foresee and recommend any further change in the licensing framework for the technical interoperability of Wifi networks between two telecom operators.
3. There is also no issue with respect to commercial interoperability as telecom operators are sharing their Wifi access points based on mutual agreements. Some mobile operators are also offloading their cellular data traffic on Wifi access points of other telecom operators, based on mutual agreements. Since the current framework is working fine and enables all telecom operators to explore various business models, we do not recommend any regulatory intervention on commercial interoperability or for any form of mandatory interoperability as such a step will be detrimental to innovative business models and will dis-incentivize investments in the sector.
4. It may be noted that currently, the integration between two telecom operators sharing the common access points requires integration in respect of type of SSIDs, type of authentication being used, IP address scheme used for access points and the complex WLC/Access separation basis the transport. Due to non-standardized integration methods, different methods/techniques are presently being used for integration with different operators. Hence, a policy framework is required which may enable all Wifi hotspots to be technically interoperable (such as 'passpoint' and 'hotspot 2.0')

compatible) thereby making it easy for all telecom operators to connect with each other. TRAI/DoT may collaborate with telecom operators for the standardization of technical standards.

Q5. Apart from frequency bands already recommended by TRAI to DoT, are there additional bands which need to be de-licensed in order to expedite the penetration of broadband using Wifi technology? Please provide international examples, if any, in support of your answer.

Airtel's Response:

1. Presently, 255MHz of access licensed spectrum in various bands is assigned to telecom operators which is serving more than a billion wireless customers in India whereas 483.5MHz is being used as unlicensed spectrum for Wifi services. It is clearly evident that the quantum of unlicensed spectrum is almost double as compared to the access licensed spectrum assigned to telecom operators. Furthermore, reuse of Wifi frequencies is better owing to it being deployed as low power higher frequencies, thereby allowing the operators to deploy greater capacities. Despite these facts, Wifi frequencies are under-utilized at present. Thus, we do not recommend de-licensing of any additional spectrum band for Wifi services until the current unlicensed spectrum is fully utilized. This is to ensure that there is no wastage of precious spectrum in any manner.
2. Presently, spectrum from 2400-2483.5MHz is allowed to be used for Wifi, both for indoor as well as outdoor. In outdoor, the maximum effective radiated power is allowed to be 4W (36dBm). This Wifi band is very close to 2.3 GHz and 2.5 GHz licensed band assigned to mobile operators after payment of auction determined price and is being used for deployment of LTE networks. It is worth mentioning that several instances of interference are being observed at many locations in this licensed band from transmission in the Wifi band. This is primarily on account of out of band emissions from the said Wifi radio equipment (due to inferior quality of the deployed equipments) and power limits imposed for outdoor usage of Wifi not being adhered to by the Wifi operators.
3. We, therefore, recommend that as a policy unlicensed band for outdoor usage should be kept away from licensed bands assigned to telecom operators via auction. The outdoor usage of Wifi frequencies assigned in 2400–2483.5 MHz should be stopped. Instead, similar quantum of frequencies in 5 GHz band may be allowed to be used for outdoor Wifi transmission with effective radiated power greater than 4 W (36 dBm),

thereby reducing the incidences of interference in the licensed 2.3 & 2.5 GHz bands and ensuring increase in range as well as decrease in overall Capex requirements for Wifi deployments. Suitable amendments to this effect may also be carried out in the NFAP.

4. In respect of TV White spaces, we would like to submit that there are no TV White Spaces in India. Unlike in some countries where Digital terrestrial transmission is well developed and many broadcasters radiate in the band from 470-698 MHz, the said spectrum is largely unused in India. Therefore the very term White Spaces, is a misnomer and any allocations in the spectrum band 470-698 MHz should not be done in a manner that will distort the market through inappropriate or inequitable regulation resulting in an unfair advantage much against the principle of level playing field.

We also believe that allocating spectrum in 470-698 MHz band in a delicensed manner, being sub GHz frequency, will result in a sub optimal /inefficient usage of this spectrum, as there will be need for very large protection zones to manage the interference resulting in inefficient frequency reuse/hopping. This contradicts the very basic advantage of using lower frequencies. Also if de-licensed, there would neither be any incentive to use spectrum more efficiently nor any control over unlicensed usage of devices.

In this context, it is also relevant to state that in response to COAI's letter on the issue, DoT has conveyed that the 470-698 MHz band or part thereof will not be delicensed and decision regarding methodology of allocation and pricing of this band shall be taken by government, taking into account all relevant aspects.

5. We believe that any spectrum band, which can be granted commercially, should not be declared as unlicensed spectrum as such an action will not only cause huge revenue loss to the national exchequer but will also lead to sub-optimal usage of that precious spectrum.

Q6. Are there any challenges being faced in the login/authentication procedure for access to Wifi hotspots? In what ways can the process be simplified to provide frictionless access to public Wifi hotspots, for domestic users as well as foreign tourists?

Airtel's Response:

1. The current process of login/authentication including OTP has been prescribed by DoT and Ministry of Home Affairs after taking into consideration the national security aspects. However, based on technology development, DoT/TRAI may review the process and scope of login/authentication procedure for Wifi to ensure that it does not become a hindrance for the proliferation of Wifi services without compromising with the national security requirements.
2. For example, as a progressive step, the Government has recently allowed use of “Aadhaar” e KYC service of UIDAI for issuing mobile connections to subscribers. The whole process is tamper proof and paper less as the requirement of submission of Proof of Identity and Proof of Address has been done away with.
3. For Wifi, one such initiative can be use of ‘Mobile Connect’ for authentication. Mobile Connect is a simple and secure digital authentication solution that uses existing mobile network and SIM authentication processes. Mobile Connect allows its users to quickly and easily authenticate third party online service providers’ websites/portals integrated with Mobile Connect without the need for end-users to create or remember usernames and passwords.
4. Mobile Connect authentication service will allow a secure registered access to Wifi through automated means on the user device and it eliminates both the insecure SMS password element and the retention of customers’ photo-IDs thereby, helping to protect consumers’ identity while meeting regulatory obligations. We request TRAI to review this method of authentication.

Q7. Are there any challenges being faced in making payments for access to Wifi hotspots? Please elaborate and suggest a payment arrangement which will offer frictionless and secured payment for the access of Wifi services.

Q9. Is there a need for ISPs/ the proposed hub operator to adopt the Unified Payment Interface (UPI) or other similar payment platforms for easy subscription of Wifi access? Who should own and control such payment platforms? Please give full details in support of your answer.

Airtel’s Response:

1. As per the RBI guidelines, there are three types of wallet – closed wallet, semi-closed wallet and open wallet. To promote telecom services and to facilitate recharging of telecom services instantly, telecom operators are already integrating their systems

with semi-closed wallets, open wallets and other online payment solutions such as banks besides using their own closed wallet. Thus, there are multiple payment options available for end customers to recharge telecom services including Wifi.

2. Therefore, we do not recommend any regulatory intervention or any special measures for separate payment solutions for Wifi service and the same should continue to be driven by market forces.

Q8. Is there a need to adopt a hub-based model along the lines suggested by the WBA, where a central third party AAA (Authentication, Authorization and Accounting) hub will facilitate interconnection, authentication and payments? Who should own and control the hub? Should the hub operator be subject to any regulations to ensure service standards, data protection, etc?

Airtel's Response:

1. From a plain reading of the consultation paper, it appears that TRAI seems to be referring to a third party payment settlement/platform. If this implies the settlement of payment between the customer and telecom operators using semi-closed/open wallet or through other payment solutions, this is already in place as telecom operators have already integrated their systems with such platforms. Hence, the issue does not warrant any regulatory intervention.
2. Another impression apparent from the consultation paper is that there might be a case of a third party payment platform integrated with telecom operators and acting as a reseller of telecom services. Since the platform will be interacting with the end customer and presumably the balance of one telecom operator's access point can be used in another telecom operator's access point, such platform will also control the end tariff for Wifi across all telecom networks. If this understanding is correct then we do not recommend such a model. This model/concept will not only take away the entire flexibility of tariff/package formations from telecom operators reducing them to a mere pipe, but such a super distributor/hub operator will effectively control the business of telecom operators without actually being a licensee.
3. Such a model has neither been envisaged in our licensing regime nor is a recommendable solution. Currently, the policy framework of Wifi services has broadly been divided into two parts - one a legal entity, who can install the Wifi network and sell the Wifi services to their customers commercially and second, any legal entity/person, who can install the Wifi network and can use Wifi services for its

own use. For first category, a legal entity is required to obtain a valid telecom licence in India and for second category, there is no requirement of any telecom licence. In our licensing framework, no other category is envisaged unlike TRAI's apparent suggestion in the consultation paper.

4. According to our understanding from the paper, this neutral third entity/super distributor would be selling the telecom services of all telecom operators to end consumers, which is nothing but reselling of telecom services. It is to be noted that under the Unified Guidelines, VNO cannot have an agreement with more than one NSO for providing the access services. Since Wifi is also access service, any VNO can only resell the Wifi services of one telecom operator in a particular service area and not for multiple telecom operators.
5. As explained earlier, Internet services including Wifi services can only be provided by a licensed entity. Licensed operators are solely responsible for all such activities including AAA, which are directly related with the access of their network and closed wallet. Thus, outsourcing such activities through regulatory intervention is unwarranted and would require a much deeper deliberation from national security perspective. It will also disturb the existing licensing framework for a purpose, which can easily be achieved through other means such as sharing of Wifi access points. Furthermore, there can never be a common Wifi pack across all Wifi networks and hence having a common Hub does not make sense at all. Such an arrangement will raise the concern of monopolization. Therefore, we do not recommend this model at all.

Q10. Is it feasible to have an architecture wherein a common grid can be created through which any small entity can become a data service provider and able to share its available data to any consumer or user?

Q11. What regulatory/licensing measures are required to develop such architecture? Is this a right time to allow such reselling of data to ensure affordable data tariff to public, ensure ubiquitous presence of Wifi Network and allow innovation in the market?

Airtel's Response:

1. In the consultation paper, TRAI has used various terminologies such as 'neutral Wifi network', 'data service provider' and 'Wifi networks and service providers'. Wifi is one of the technology used to provide Internet access services to end consumers. In India, Internet/Broadband services can only be offered by a UASL/CMTS/Unified

Licence (Access Service Authorization)/ISP/Unified Licence (Internet Service Authorization). Therefore, while any initiative to increase growth of Wifi services is laudable, there should not be a separate category of 'Wifi service providers', 'data service area', neutral Wifi network' in the licensing regime.

2. The reselling of telecom services including Wifi services cannot be done without obtaining a Unified Licence (VNO). Therefore, any entity who wants to resell Wifi on commercial basis to any consumer has to take a telecom licence granted under Section 4 of the Indian Telegraph Act 1885. Since sharing of available data by any customer with another customer against commercial consideration would tantamount to reselling of data services, the same cannot be done without obtaining a valid telecom licence.
3. Furthermore, tariffs are offered to individual customers based on the premise that the services will be consumed by the individual himself and will not be offered for reselling. Allowing such customers to resell their data for commercial considerations will not only vitiate the entire licensing regime but will also jeopardize the investments made by telecom operators.

Q12. What measures are required to promote hosting of data of community interest at local level to reduce cost of data to the consumers?

Airtel's Response:

N/A

Q13. Any other issue related to the matter of Consultation.

Airtel's Response:

N/A