

Telenor (India) Response to TRAI Consultation Paper on Proliferation of Broadband through Public Wi-Fi Networks (No.14/2016 dated 13 July 2016)

Preamble

The objective of this consultation paper is to encourage public Wi-Fi networks from a public policy perspective for greater broadband penetration. The Authority has rightly noted that “Wi-Fi is a complementary technology, not competing”.

The paper is aptly placed in time when India is at the cusp of digital evolution. Accelerating broadband penetration from metros and urban areas to smaller cities and rural areas will improve Internet connectivity which is critical for the success of the ‘Digital India’. **We believe that expanding broadband access through public Wi-Fi networks will in all likelihood boost the government’s Digital India initiatives.**

Existing wireless Infrastructure will greatly benefit with short-range wireless connectivity through economical and quick-to-deploy Wi-Fi networks. It is important to **identify the bottlenecks and clear them for mass adoption and quick deployment of Wi-Fi networks. Suitable changes should be made in the licensing conditions** to incentivize and accelerate its adoption; and efforts should be made to avoid double taxation burden on providing internet access via Wi-Fi networks.

Before responding to the questions raised in the paper, it is important to highlight the present regime and necessary changes required for enabling the proliferation of broadband through Wi-Fi hotspots across the country in a short span of time.

Wi-Fi as a means of off-loading mobile data

Wi-Fi technology uses low power access points in the de-licensed ISM¹ bands so as to avoid interference to networks in the same or nearby locations. By design it is meant for indoor or limited outdoor usage but it is designed in a distinctly different form compared with cellular network architecture. Thus, a **ubiquitous network across large geographies cannot be created using this free / de-licensed band.** To that extent the ‘Public Wi-Fi hotspots’ or ‘Wi-Fi in public spaces’ is an appropriate term rather than ‘Public Wi-Fi networks’ as no network can be built using Wi-Fi.

As networks continue to expand, in order to provide better coverage of data services inside buildings / in public spaces at a higher speed, TSPs have a choice to deploy equipment using licensed frequency (small cell, macro cell, IBS) or free/ de-licensed band (Wi-Fi). Both the technologies have their own advantages and disadvantages in terms of high cost of acquisition of spectrum and a trade off with interference in the de-licensed bands.

In our opinion **SUC is not applicable** on those **services which are delivered using de-licensed bands**, hence a clarification may be issued so as to incentivize and promote greater uptake of this technology.

¹ The Industrial, Scientific and Medical Spectrum band

Wi-Fi in public spaces

Wi-Fi in Public Spaces typically refers to Wireless Access Points created in de-licensed bands for provisioning of licensed Internet access services by authorized and licensed service providers. Presently, **there are only two licensed entities that provide end-services 'access' such as Internet - TSPs² and ISPs³** and are rolling out Wi-Fi access points wherever feasible.

The department of telecom has issued licenses to Telecom Service Providers and Internet Service Providers for providing commercial telecom services. These licenses are granted on non-exclusive basis, meaning that more number of such licenses can be granted subject to meeting the eligibility criteria. Hence, **any entity other than TSP/ISP is not allowed to provide telecom services** and at the same time such licenses are freely available.

Our license **does not allow resale of telecom services** and Section 31 of the Operating conditions specifically **restricts the transferability** of Subscriber Identification Module (SIM) or equivalent device or subscriber terminal (CPE) from one subscriber (end user) to another. **The subscription to telecom services are for personal use and hence not transferable.** The telecom consumer charter available on our website clearly mentions under Section 7 that the subscriber shall not assign any right or create third party interests without prior written permission of service provider. Further, the subscriber shall not assign/ transfer/ re-supply/ lease/ rent or create any charge/ lien on the SIM card or the services provided by service provider without prior written permission of service provider.

When the Authority says 'Public Wi-Fi networks' what it actually implies is 'Internet Access through Wi-Fi in public spaces by licensed service providers'.

So, in our view, this should be made amply clear that **Internet Access through Wi-Fi in public spaces can be provided by Licensed Service Providers only.** This would prevent any rampant alternate/unlicensed network-services creation resulting in resale of telecom / internet services denying the national exchequer their legitimate share of revenue from licensed services.

Business Models (existing)

The following business models have developed in the market place:

- a) Wi-Fi access points created by licensed TSPs/ISPs at public spaces and the services being sold by the service provider through their distribution network.
- b) Wi-Fi hotspots deployed by consumers in their private spaces for their self – consumption i.e. home or corporate wifi-LAN.

² Telecom Service provider offering access services (Voice and data) using access technology through licensed spectrum by obtaining Access Service Authorisation under Unified License.

³ Internet Service Provider offering Internet / data services by obtaining ISP license / Authorisation under Unified License

Sharing as a business model

New business models can be developed but need the requisite policy push:

1. **Passive sharing** – where the Wi-Fi access point is deployed by any entrepreneur and the same can be shared by one or more TSPs/ISPs on rental basis. The owner of the access point infrastructure need not obtain any telecom license to purchase the equipment in de-licensed bands.
2. **Active sharing** – the licensed TSPs/ISPs deploy multiple Wi-Fi access points along with Internet gateway and backhaul to connect to the hotspots. This active infrastructure can be shared by more than one TSP/ISP. Presently active infrastructure sharing is allowed amongst TSPs vide the license amendment dated 11 February 2016, similar active sharing arrangement should be extended to share network between TSPs and ISPs and also amongst ISPs. This implies that if any TSP/ISP has deployed active infrastructure for providing Internet services, other TSP/ISP should be allowed to freely share the same infrastructure including the backhaul, last mile and the Wireless - Access Points. This will reduce the cost burden and catalyze faster deployment of Wi-Fi Infrastructure at public spaces.
3. **Data Roaming** – one of the licensed TSP/ISP deploys the entire access network and other TSP/ISP may like to enter into an roaming arrangement without deploying it's own access network. Presently this is allowed under the Unified License amongst TSPs, same may be extended for Internet services between TSPs and ISPs and also amongst ISPs. This arrangement is a low CAPEX model and will reduce the entry barrier for licensed service providers to provide a seamless consumer experience with higher data speeds using Wi-Fi networks. For a consumer this model would not only provide ease of access but also ease of payment.

Policy bottlenecks

In the earlier section, we have mentioned three business models that can be developed to promote deployment of Wi-Fi technology in public spaces for greater broadband access. However, the present license conditions allow sharing of active infrastructure and roaming only between TSPs. Similar arrangements between ISPs has not happened for need of a license amendment. Going forward, TSPs and ISPs may also like to share active infrastructure and would like to freely allow roaming to each other's customers in order to achieve higher operational efficiencies. Of course this will on the basis of commercial arrangements, but the facility should be provided in the License by way of amendments.

The payment made between TSPs and ISP for Wi-Fi services should be allowed as a pass through, else it will be subjected to double taxation. As long as a licensed entity is paying license fee (**SUC not applicable on Wi-Fi**) then it should be allowed as pass through to the other licensed service provider. As understood, some of the existing ISPs are not paying License fee on pure internet services and currently the matter is sub-judice. In view of the same, applicability of license fee across all ISPs should be uniform – whether existing or new.

Incentivize, proliferate and reap benefits

In line with the Authority's earlier recommendation, the revenue from Wi-Fi services should be excluded from the wireless revenue and added as a line item in the wireline revenue section of the consolidated AGR statement.

TRAI recommendation on AGR:

*3.5 The Authority recommends that the Spectrum Usage Charges should be levied on AGR of respective telecom services which use **access spectrum** in operations or providing services. (Para 2.38)*

The license amendment to UL dated 06 Dec 2013 clearly mentions the specific bands that are defined as access spectrum and de-licensed frequencies are not part of this definition, hence any SUC on Wi-Fi is not applicable as per UL.

The section B of chapter II of the consultation paper presents the current abysmal state of adoption of Wi-Fi networks. India needs to catch-up fast with the global developments and faster adoption of Wi-Fi technology is possible only when the regulatory and licensing impediments are suitably addressed and incentive based forward looking liberalized approach is adopted.

Summary

- Presently only TSPs and ISPs are licensed to provide telecom services on commercial basis (including data services) there is no provision of Wi-Fi service provider. Any entity who would like to participate in commercial deployment of Wi-Fi infrastructure may obtain Unified License / ISP license.
- Suitable licensing amendment may be issued to enable active infrastructure sharing and data roaming between TSPs and ISPs networks in order to increase broadband access footprints for the benefit of data consumers..
- The Advance Authentication by using protocols such as EAP⁴, AKA⁵ may be promoted as an alternate to existing voucher authentication. This will enable seamless customer experience while availing Wi-Fi access points at public places.
- Clarification may be issued on the non-applicability of SUC on internet services using Wi-Fi technology in free/ de-licensed bands.
- To avoid double taxation, the treatment of payment made between TSPs and/or ISPs for Wi-Fi services should be allowed as a pass through.

⁴ Extensible Authentication Protocol

⁵ Authentication and Key Agreement Protocol

Question wise Response

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

Response:

- There are regulatory issues and licensing restrictions which were earlier not envisaged, these needs to be addressed for the faster adoption and massification of Wi-Fi access points across the country.
- The present license conditions allow sharing of active infrastructure and roaming between TSPs basis mutually decided commercials. Similarly, **TSPs and ISPs would also like to share active infrastructure and freely allow roaming to each other's customers, same is not allowed** and require license amendment.
- In view of above licensing restrictions, it is envisaged that for the deployment of Wi-Fi at public spaces, together TSPs and ISPs cannot do integration of their networks and billing system **to provide seamless customer authentication and payment experience**. This impediment can be done away by **allowing sharing of active infrastructure and roaming between TSPs and ISPs**.
- Wi-Fi uses free/ de-licensed band and hence any **SUC is not applicable** on the revenue earned from the services offered using this spectrum. The amendment to UL dated 06 Dec 2013 defines 800/900/1800/2100/2300/2500 as access spectrum. Suitable clarification would increase the uptake of this technology.
- The payments made by one licensed entity to another on account of Wi-Fi services is presently not allowed as pass through. This result is dual taxation of license fees at the hands of both licensed entities sharing a network. Suitable amendment in the licensing finance norms would eliminate this regulatory hurdle.

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

Response:

- A city wide network of Wi-Fi may not be supported by this technology itself as it is for low power indoor or limited outdoor usage. It is also not designed in a cellular architecture, rather it is designed for localised use or creation of hotspots.
- Nevertheless, pockets of high speed data hotspots can be created only by licensed entities, any other entity which aspires to provide internet on commercial basis whether through Wi-Fi or other host of technologies should **come under the ambit of existing licensing and regulatory framework by acquiring UL / ISP license**. We are of the view that it will accelerate the deployment of public Wi-Fi hotspots in a transparent

manner protecting exchequers revenue and also ensure level playing field for TSPs/ ISPs who have invested heavily in building the networks with the licensed spectrum.

- While increasing the footprints of Wi-Fi access points, it is critical to ensure that all security compliances are being complied at all the times. It may be noted that unlicensed and unsecured Wi-Fi access can lead to unlawful activity including threat to national security. Thus, it is important that only licensed entities should be allowed to offer Wi-Fi access points as these service providers are under obligation to ensure that all security related conditions to be followed scrupulously.
- Wi-Fi networks are not using any commercial natural resources and offering pure internet service using **unlicensed ISM band hence SUC is not applicable** on the revenue regenerated from Wi-Fi networks. However, a clarification is needed.
- The dual payment of License Fee between network sharing licensees can be avoided by **allowing pass through for revenue share payments between these licensees.**
- The telecom networks have benefited immensely from the share of infrastructure, similar amendments for active infrastructure sharing and roaming should be allowed between TSPs and ISP and also between ISP/ISP. New business models will evolve, conceptually a few are explained in preamble.
- Broadband penetration has direct relationship with the overall growth of the economy of any nation. In view of the same, it is suggested to incentivize the Wi-Fi service provider by way of offering USOF subsidy as well as relaxation in corporate taxes for the deployment of Wi-Fi hotspots especially in rural and remote areas of the country.

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

Q4. What measures are required to encourage interoperability between cellular and Wi-Fi networks?

Response to Q3 & Q4:

- Wi-Fi comes in many shapes and sizes. It is widely used by consumers and enterprises and in recent years it has become increasingly more popular with mobile operators globally. In 2012, with the launch of Hotspot 2.0, also known as Passpoint, eliminates the need for user intervention when connecting to Wi-Fi hotspots, and delivers state-of-the-art WPA2 security⁶. Mobile operators have started using Wi-Fi to extend their offerings and augment their cellular experience with seamless Wi-Fi connectivity.
- TSPs and ISPs offer various access services including Wi-Fi networks / hotspots to their respective consumers. However to do massification of public Wi-Fi networks, TRAI has rightly noted the need of interoperability between the Wi-Fi networks as well as between

⁶ Ericsson research blog on "Carrier Wi-Fi – what to expect in the near future" <https://www.ericsson.com/research-blog/uncategorized/carrier-wi-fi-what-to-expect-in-the-near-future/>

Wi-Fi and Cellular networks which is similar to the existing roaming arrangements between TSPs to get access to other TSPs cellular networks.

- TSPs already have bilateral roaming arrangements between them and the same can be used for Wi-Fi networks as well.
- Necessary changes in policy is required to facilitate Wi-Fi roaming between TSPs and ISPs to promote seamless customer experience between the networks and the same can be achieved by TSPs / ISPs by entering into bilateral agreements for data roaming with each other on mutually agreeable technical and commercial conditions.

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 Wi-Fi technology? Please provide international examples, if any, in support of your answer.

Response:

- We are of the view that TRAI should reiterate its earlier recommendation to the government as specified in para 2.24 of the paper.
- TRAI should also recommend to DoT to make frequency bands 5150-5350 MHz and 5725-5875 MHz to use the same for outdoor and dedicated short range communications within the specified power limits to promote Wi-Fi networks.

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

Response:

- All users of Wi-Fi are also the subscriber of telecom service provider and/or internet service provider. Their authenticated profile is always available with the TSPs/ ISPs and they use it frequently for recharging their connections. Once data roaming is allowed between TSPs and ISPs and also amongst ISPs the authentication will be shared at the network layer and give seamless experience to subscribers.
- The OTP based authentication is the only tool being used till now for authentication purposes. In addition to above, we would like to suggest Mobile Connect (m-connect) as an option for customer. It is a simple and secure authentication platform for providing a universal authentication solution which is being facilitated by mobile operators by leveraging their existing mobile network and SIM authentication (e.g. EAP, AKA authentication protocols) processes, and based on the concept, brand and technical specification developed by the GSMA globally. This platform will offer customers a seamless and secure way of authentication. The entire process of captive portals, SMS OTPs, manually entering the information has too many dependencies and

is also subject to a high fail-rate. Mobile Connect can offer the simplicity and flexibility that customers want and something the operators should offer to make the customer journey better.

- TRAI should recommend that the TSPs/ISPs should have flexibility to adopt any of the authentication methods in line with their business requirements as long as it is secure and meets the security requirements.

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

Response:

- Subscribers are regularly recharging their mobile or internet accounts using various payment methods viz. cash, wallet, credit/ debit card, internet banking, ATM machines etc. The relationship for payments by consumers to TSPs / ISPs is well established and robust. The same can be extended to internet usage using Wi-Fi.
- TSP and ISP should have the flexibility of combining the Wi-Fi data plan with their consumers existing 2G/ 3G/ 4G data plan/ pack.
- In case of data roaming, the appropriate amount can be passed on by the home service provider to the roaming partner. This should be allowed as pass through so that double taxation can be avoided. This shall provide seamless experience to consumers.
- It is suggested that the all payment methods should be allowed including deduction from talk time so that customer does not go through the hassle of buying special coupons or recharge vouchers or access payable Wi-Fi through Visa / Master card.

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?

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 Wi-Fi access? Who should own and control such payment platforms? Please give full details in support of your answer.

Response Q8 & Q9:

- At the outset, **we do not support any hub based platform for Wi-Fi services**, as a non-licensee cannot provide telecom services (including data services).

- All the functions such as **Authorization, Accounting and Authentication (AAA)** are performed even today though bilateral roaming arrangements between the TSPs for Interconnection, authentication and payments. This has evolved as a mature and successful way of enabling subscribers to use the services seamless even when they roam outside their networks. We see no requirement for building an additional layer when the existing arrangements are robust.
- **Adopting any central third party AAA hub will increase the overall cost similar to MNP services.** This will be an additional cost which can be avoided by doing roaming arrangements between TSP and ISP.
- We recommend that all TSPs and ISPs should be allowed to connect with each other through commercially mutually agreed roaming agreements as long as Government interest and revenue is protected.
- Similarly, UPI may also be allowed to act as an aggregator which will be an option available for TSPs and ISPs to adopt depending upon their business models.

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?

Response:

- Any licensed entity (TSP/ ISP) is within its right to create a common grid for the purpose of sharing excess end consumer bandwidth with other consumers on mutually agreed commercial terms & conditions. However, such sharing can solely be done by the internet service provider for its customers.
- This is very much feasible and already deployed by various TSPs in USA and Europe. However, **to make Wi-Fi hotspots as successful and massification in India, an appropriate policy regime is imperative for addressing regulatory and licensing issues.**
- For instance, **British Telecom**, a leading communications services provider of UK is having **UK's largest Wi-Fi networks with over 5 million hotspots**⁷ with varied tariffs.
- Even, some of the global Wi-Fi roaming aggregators like Boingo, iPass etc are also offering their services covering over 58 million hotspots worldwide covering ~60 percent of the countries. In India, **such entities should be allowed to do business only after obtaining Unified License / ISP License.**
- In another example, FON is offering multi-functional Wi-Fi Service Management Platform supporting TSPs to rollout Wi-Fi access points. Presently, FON is offering over 20 mn hotspots globally. Such platform allows consumers to securely share a

⁷ <http://www.btwifi.co.uk/>

little part of their own bandwidth out of the subscribed data quota with fellow consumers in exchange for access to other people's FON portals all over the world thereby creating Wi-Fi sharing community. This kind of business model is made possible by the involvement of licensed telecom service provider.

- All service providers need to be incentivized adequately for faster deployments of Wi-Fi access points. Further details are given in response to Q2, same can be referred.

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 Wi-Fi Network and allow innovation in the market?

Response:

- Please refer our response to Q1, Q2, Q3 and Q4.
- The current Unified Licensing regime doesn't allow end consumer to transfer the SIM and services subscribed by him to any third party / person. Similarly, the **reselling of data is prohibited and is against the Unified Licensing Regime**. Only licensed operators can offer Internet services on commercial basis.
- However, we are of the view that instead of allowing reselling of data, **roaming between Wi-Fi and Cellular networks should be allowed** enabling faster adoption of Wi-Fi networks across the country.
- **Allowing reselling of data by any person / entity other than licensed entity may not only pose a security issues but also a revenue loss opportunity for exchequer.**

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

Response:

- The hosting of data of community interest at local level is important for the overall growth of broadband services in the country.
- This is being done even today wherein local caching of the frequently accessed content on Internet is done in order to increase the speed of accessing this popular content to the consumer.

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

Response: None