Comments and Recommendations to the TRAI Consultation on

Telecommunication Infrastructure Sharing, Spectrum Sharing, and Spectrum Leasing

3 March 2022

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A joint submission by the Centre for Internet and Society (CIS), India & Mozilla on the merits of including "<u>use-it-or-share it</u>" mechanisms within its spectrum sharing and leasing strategies.

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[1] This utilizes and builds upon excerpts from our previous submission on Auction of Spectrum in frequency bands identified for IMT/5G authored by Abhishek Raj, Steve Song, and Udbhav Tiwari.

Table of Contents

Preliminary

The Centre for Internet and Society (CIS) is a non-profit organization that undertakes interdisciplinary research on the internet and digital technologies from policy and academic perspectives. Through its diverse initiatives, CIS explores, intervenes in, and advances contemporary discourse and practices around the internet, technology, and society in India, and elsewhere. Over the last decade, CIS has worked extensively on policy issues related to telecom, internet access, and digital inclusion, etc. and has also contributed to various TRAI consultations in the past.

Mozilla is the maker of the open-source Firefox web browser, the Pocket "read-it-later" application and other products and services that collectively are used by hundreds of millions of individuals around the world. Mozilla is also a global community of contributors and developers who work together to keep the internet open and accessible for all. As a mission-driven technology company and a non-profit foundation, we are dedicated to putting people in control of their online experience, and creating an internet that is open and accessible to all. To fulfill this mission, we are constantly investing in the security of our products, the privacy of our users and in advancing the movement to build a healthier internet.

We appreciate the continued efforts of the Telecom Regulatory Authority of India (TRAI) to have consultations on important policy issues. We are grateful for the opportunity to put forth our views and comments to the consultation paper on "[Telecommunication Infrastructure Sharing, Spectrum Sharing, and Spectrum Leasing](#)"

Introduction

The internet is a necessity for socio-economic development in both developing and developed countries.[2] Broadband (or, high-speed) internet access is a powerful tool not only for delivering essential services such as education and healthcare but also offering increased opportunities for women empowerment and environmental sustainability and contributing to enhanced transparency and accountability of government.[3]

The COVID-19 pandemic has only underscored the need for *meaningful universal connectivity*[4], i.e. among other things, internet access should be "available, accessible, relevant, and affordable" across the world. The pandemic has made it clear to the policymakers and communication regulators that inclusion must be prioritized above everything else if the Internet is not to become an amplifier of inequality. Communication technology is a natural amplifier of human activity. Those with affordable access to communication move forward while those without are quite literally invisible to the connected. The inescapable conclusion is that inclusiveness, making sure everyone has affordable access to broadband, must be a policy priority.

Our comments in this submission relate specifically to Chapter 3 in the consultation on the Sharing and Leasing of Spectrum. We hope this joint submission encourages TRAI to consider implementing "use-it-or-share-it" provisions within its spectrum sharing and leasing strategies. Our objective is to assist TRAI to formulate a strategy that ensures that spectrum will be available to serve the connectivity needs of rural/remote populations. We believe that including these provisions can have a positive impact to increase digital inclusion in India.

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[2] World Bank. Connecting for Inclusion: Broadband Access for All. <https://www.worldbank.org/en/topic/digitaldevelopment/brief/connecting-for-inclusion-broadband-access-for-al> ; Song, S., Moreno, C. R., Esterhuysen, A., Jensen, M., & Navarro, L. (2018). The rise and fall and rise of community networks. *Global Information Society Watch*. p7-12. <https://espectro.org.br/sites/default/files/downloads-article/APC%20-%20GisWatch%202018.pdf >

[3] World Bank. Connecting for Inclusion: Broadband Access for All. <https://www.worldbank.org/en/topic/digitaldevelopment/brief/connecting-for-inclusion-broadband-access-for-al>

[4] State of Broadband Report 2019: Broadband as a Foundation for Sustainable Development. Geneva. International Telecommunication Union and United Nations Educational, Scientific and Cultural Organization. <https://www.itu.int/dms_pub/itu-s/opb/pol/S-POL-BROADBAND.20-2019-PDF-E.pdf >

Making spectrum sharing and leasing more inclusive

In conventional principles, spectrum, especially the mid-band spectrum, is visualized as a 'scarce natural resource'. Spectrum management strategies are naturally centered around this principle. However, the reality is that most government and commercial bands are underutilized.[5] Scarcity of spectrum as a natural resource is a principle that applies more to urban areas than rural areas; in rural areas, a large amount of spectrum remains unused. Furthermore, this perceived scarcity leads to excessively high reserve prices. Since 2010, the Government of India has consistently used auctions for spectrum allocation and in only 1 out of the 7 auctions held so far, the government was successful in selling 100% of the spectrum. Unsold spectrum also implies revenue loss for the government. One of the reasons for this lackadaisical response, barring the 2010 auctions, is the high costs of spectrum acquisition in India – higher than many other countries in the world. According to one estimate, at 7.6% of their aggregate revenue, spectrum costs in India are amongst the most expensive in the world.[6] Since network operators shell out significantly higher costs for spectrum compared to other emerging markets, their ability to invest in network upgradation and infrastructure is severely impacted.

The spectrum licenses, or the *right to use certain specified radio spectrum frequencies*[7] are typically national or sub-national in scope.[8] As a result, national mobile operators tend to orient their business models towards investing in more densely populated urban areas. Urban areas have a large customer base and higher income levels. Therefore, operators pin their hope for a higher return on investment (ROI) from such areas. On the contrary, rural and remote areas have a lower population density coupled with lower income levels. Consequently, operators refrain from making large investments in rural areas. The

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[5] Calabrese, M. (2021). Use it or Share It: A New Default Policy for Spectrum Management. *Available at SSRN 3762098*.
<https://papers.ssrn.com/sol3/Delivery.cfm/SSRN_ID3762098_code2826029.pdf?abstractid=3762098&mirid=1 >

[6] Shivansh Mehta & Aribba Siddique. The Telecom Story: Ringing in the Reforms.
<https://ijpiel.com/index.php/2021/11/25/the-telcom-story-ringing-in-the-reforms/>

[7] See p. 7 of 174, Notice Inviting Application for Auction of Spectrum
<https://dot.gov.in/sites/default/files/Notice%20Inviting%20Applications%20%28NIA%29%202021_1.pdf>

[8] In India, a Unified License holder with authorization of access services can submit an application for obtaining the *right to use of spectrum* which is given through auction of spectrum at a sub-national level, called Licensed Service Areas.

unfortunate result is that spectrum in many rural and remote areas, even though assigned to an operator, remains unused.[9]

For the exclusively licensed spectrum, a property-rights-based approach that guarantees exclusivity to the license holder is the international norm for the IMT frequency bands. Undoubtedly, this model has enabled highly successful investment in national mobile telephony (and now mobile broadband) networks all over the world. However, as demand for spectrum has exceeded its administrative availability, the cost of access to IMT spectrum has risen dramatically. While this may ostensibly be a boon to governments who see the telecom sector as a critically-needed influx to the treasury, the rise in the cost of spectrum has had the unintended consequence of establishing an insurmountable barrier[10] to smaller operators who are the likely source of innovation needed to bridge the digital divide.

Recently, the vice-chairperson of a leading telecom operator of India made a statement that very well enlightens the discussion:

> "…If the spectrum price remains too high, then quite clearly with lack of funds the operators will have to confine the rollouts to top cities only, which definitely would not be desirable"[11]

Responsive spectrum management can help bridge the digital divide

Telecommunications has evolved from a state-owned public utility sector to a more liberalized and private-dominated sector. Liberalization and privatization of the telecommunications market resulted in a massive investment in telecom infrastructure and remarkable spread of telecommunication networks around the world, not to mention the growth of the internet.

However, despite this growth, we still see an existing digital divide between rural and urban areas, poor and rich areas. As per the TRAI's Performance Indicator Report (July -Sept 2022),

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[9] Song, S., Rey-Moreno, C., & Jensen, M. (2019). Innovations in Spectrum Management: Enabling community networks and small operators to connect the unconnected. *Internet Society*. <https://www.internetsociety.org/resources/doc/2019/innovations-in-spectrum-management/ >

[10] India may have finally realised it needs to reduce 5G spectrum base price. Disruptive.Asia <https://disruptive.asia/india-to-reduce-5g-spectrum-base-price/>

[11] Taneja, M. (2021) 5G to remain confined to top cities if spectrum price is high: Akhil Gupta. *ET Telecom* <https://telecom.economictimes.indiatimes.com/news/5g-to-remain-confined-to-top-cities-if-spectrum-price-is-high-akhil-gupta/88291735 >

while the urban teledensity is 134.62%, rural teledensity is only about 58%. Similarly, urban internet subscriber density (internet subscribers per 100 population) is 104.77 %, whereas rural internet subscriber density is only 38.33 %. A digital divide is apparent between rural and urban India.

The growing value of "being connected" coupled with slowing growth in poor and rural areas suggests that favorable provisions are needed to incentivize and lower the cost of access to the unserved and under-served regions in the country. While devising policies to bridge this divide, it must be borne in mind that the cost of deploying infrastructure in remote areas can be nearly twice as expensive, while revenue opportunities can be ten times lower, as demonstrated by a GSMA report in 2018.[12]

Since licenses and spectrum are typically assigned for service areas that are predominantly identified by state boundaries (there are 22 of them), therefore the cost of spectrum in Lucknow is the same as for Dadri, for Bangalore the same as for Ramanagara and so on.[13] With operators predominantly catering to urban markets, spectrum in remote areas remains under or in places unutilized due to lack of investment in allied infrastructure. Consequently, this has led to a stark digital divide, one which has thus far been the most difficult for Indian policymakers to overcome.

Challenge with Coverage Obligations

Coverage obligations or roll-out obligations have been in use in operator and spectrum-licensing frameworks since the 1990s. These obligations are an attempt to ensure the equitable provision of telecommunication services. While little has been documented regarding operator compliance with coverage obligations, it is an 'open secret' that many operators fail to meet their obligations by hoarding spectrum,[14] preferring to either engage in lengthy debate as to whether they have met their obligations or to simply pay a fine rather than undertake investment in less profitable regions in order to meet their obligations.

This is not to say that coverage obligations are altogether a bad idea, or that they don't work at all, or that operators always default on obligations. But rather we want to emphasize that complementary mechanisms (such as spectrum sharing or 'use it or lose it provisions') are

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[12] GSMA (2018). Enabling Rural Coverage: Regulatory and policy recommendations to foster mobile broadband coverage in developing countries. <https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2018/02/Enabling_Rural_Coverage_English_February_2018.pdf >

[13] Rajat Kathuria, Isha Suri. Why spectrum needs a change in approach. Indian Express. <https://indianexpress.com/article/opinion/columns/why-spectrum-needs-a-change-in-approach-8235997/>

[14] Sandeep Joshi. New policy will force operators to pay for spectrum hoarding. The Hindu. <https://www.thehindu.com/news/national/new-policy-will-force-operatorsto-pay-for-spectrum-hoarding/article2604595.ece>

needed to mitigate risk. There is a need for a more affirmative, non-punitive (i.e. sharing unused spectrum rather than losing it) approach than use-it-or-lose-it build-out requirements.[15] A more responsive spectrum-management framework, that enables cooperation between large and small players alike, is the need for the hour. This can enable the market to adapt to changing requirements, including the rapid increase in demand for connectivity during the COVID-19 pandemic, in rural and underserved regions.

Although the application of universal service funds in some countries has been able to mitigate some of these problems in bridging the connectivity divide by subsidizing the capital costs of rural deployments, the operational costs in many cases still do not match the income levels in rural areas. In India, a sizable portion of Universal Funds has gone into building a state-sponsored optical fibre backbone network through *Bharat Net* with an assumption that the private sector will build access networks at user level in the last mile.[16] But, there have been very few takers for the *Bharat Net* infrastructure and rural internet access through this infrastructure has not really happened.

Limitations of unlicensed Wi-Fi spectrum and the need to provide small operators access to wireless broadband spectrum

The economic value that can be unlocked when wireless technologies are made available through a combination of affordability and regulatory accessibility through license-exempt regulation or Wi-Fi is well-established. It is estimated that the *baseline*[17] *(i.e. 2.4 and 5 GHz Wi-Fi) economic value* of Wi-Fi in India alone in 2021 is USD 130 billion, which is forecasted to reach USD 177 billion by 2025.[18] License exempt spectrum represents one of the few avenues through which small operators can enter the wireless broadband market. Small operators

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[15] Calabrese, M. (2021). Use it or Share It: A New Default Policy for Spectrum Management. p.6. *Available at SSRN 3762098*.
<https://papers.ssrn.com/sol3/Delivery.cfm/SSRN_ID3762098_code2826029.pdf?abstractid=3762098&mirid=1 >

[16] Ponappa, S. (2020). Response to TRAI Consultation Paper on Broadband Connectivity and Speed. <https://cis-india.org/telecom/cis-trai-consultation-response-broadband >

[17] Regulations in India allow license-exempt usage only in 2.4 GHz and 5 GHz band.

[18] Source: The Economic Value of Wi-Fi: A global view (2021-25). Authors: Raúl Katz, Juan Jung, Fernando Callorda. <https://www.wi-fi.org/downloads-public/The_Economic_Value_of_Wi-Fi-A_Global_View_2021-2025_202109.pdf/37346 >

have leapt to take advantage of improvements in Wi-Fi technologies as both an access and a backhaul technology.

However, Wi-Fi has distinct limitations, evident especially when it is used to service more sparsely populated regions. The restricted power output of Wi-Fi – which enables its license-exempt status– also has the impact of significantly increasing the number of access points required to cover a given region.[19] If we were to compare LTE and Wi-Fi in terms of coverage, what a single LTE base station can cover might actually require dozens or even hundreds of Wi-Fi access points in order to provide the same coverage.

There is a need to empower and create an ecosystem for small operators by providing them access to wireless broadband spectrum beyond certain license-exempt frequencies. We believe this can be achieved through a use or share approach, described in more detail below.

Digital Inclusion through a *Use-or-Share* approach

The National Digital Communication Policy (NDCP) 2018 recognizes *spectrum as a key natural resource for 'public benefit' to achieve India's socio-economic goals.[20]* Telecom Minister Ashwini Vaisnaw, recently in an interview, remarked about the 'public good' element in spectrum pricing and striking a balance between maximizing revenue and maximizing services to the poor.[21] Quoting his statement:

> "Earlier, spectrum was seen as a resource that should maximize revenue. Today, there is a balance in thought process between maximizing revenue and providing

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[19] Deepak Gupta. 4G vs WiMax vs Satellite, which Internet is better for rural areas. TechUnwrapped. <https://techunwrapped.com/4g-vs-wimax-vs-satellite-which-internet-is-better-for-rural-areas/>

[20] See 1.8 on p. 16 of 24, National Digital Communication Policy, 2018 <https://dot.gov.in/sites/default/files/2018_10_29%20NDCP%202018.pdf >

[21] PTI (Dec 13, 2021) Public good' element in spectrum pricing now widely recognised: Telecom minister Ashwini Vaishnaw. *Zee Business* <https://www.zeebiz.com/india/news-public-good-element-in-spectrum-pricing-now-widely-recognised-telecom-minister-ashwini-vaishnaw-173290 >

maximizing service to the poor… somewhere the balance should be struck… that balance is today in a consultation process in the country."[22]

Even the draft telecommunications bill, 2022 provides for administrative allocation of spectrum for governmental functions or purposes in view of public interest or necessity. Furthermore, Clause 5(8) of the draft telecommunications bill, 2022 states "The Central Government may, to promote optimal use of the available spectrum assign a particular part of a spectrum that has already been assigned to an entity ("primary assignee"), to one or more additional entity/ entities ("secondary assignees"), where such secondary assignment does not cause harmful interference in the use of the relevant part of the spectrum by the primary assignee, subject to the terms and conditions as may be prescribed."[23] Amidst this backdrop, we suggest that there is an opportunity to bridge the chasm that exists between expensive exclusive spectrum licensing and the license-exempt ecosystem in the auctions by enshrining "use-it-or-share-it" provisions in the spectrum licenses that will be issued to winning bidders. This would effectively alter the rights of the primary spectrum licensee from "right to exclusivity" to "right to protection from interference".

As such, 'use-it-or-share-it' rules enable the regulator to grant secondary access to licensed or governmental spectrum that is unused or underutilized.[24] 'Use-it-or-share-it' rules expand the productive use of spectrum without risking harmful interference or undermining the deployment plans of primary licensees.[25] A use-it-or-share-it policy is based on a more *affirmative, non-punitive approach compared to the current "use-it-or-lose-it" build-out requirements.*[26]

Recognizing that large amounts of the licensed spectrum remain unused, especially in rural areas, regulators around the world have begun to implement shared spectrum regulation

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[22] Balancing service to poor spectrum revenue is key. *The Hindu* <https://www.thehindu.com/business/public-good-element-in-spectrum-pricing-now-widely-recognised-telecom-minister/article37944598.ece >

[23] Draft Indian Telecommunication Bill, 2022. < https://dot.gov.in/sites/default/files/Draft%20Indian%20Telecommunication%20Bill%2C%202022.pdf>

[24] Calabrese, M. (2021). Use it or Share It: A New Default Policy for Spectrum Management. *Available at SSRN 3762098.* <https://papers.ssrn.com/sol3/Delivery.cfm/SSRN_ID3762098_code2826029.pdf?abstractid=3762098&mirid=1 >

[25] Calabrese, M. (2021). Use it or Share It: A New Default Policy for Spectrum Management. *Available at SSRN 3762098.* <https://papers.ssrn.com/sol3/Delivery.cfm/SSRN_ID3762098_code2826029.pdf?abstractid=3762098&mirid=1>

[26] Calabrese, M. (2021). Use it or Share It: A New Default Policy for Spectrum Management. *Available at SSRN 3762098.* P.6 <https://papers.ssrn.com/sol3/Delivery.cfm/SSRN_ID3762098_code2826029.pdf?abstractid=3762098&mirid=1 >

that continues to empower spectrum license holders while at the same time unlocking access to spectrum in areas where operators have no strategic interest. Some examples include:

The United States of America (USA): Federal Communications Commission (FCC), communication regulator of the USA, has been a pioneer in implementing opportunistic spectrum sharing. FCC has implemented various measures that are mostly a variation of 'use-or-share' provisions. A major instance of use-or-share provisions is in the 3.5 GHz spectrum with Citizen Broadcast Radio Services (CBRS).[27] CBRS is a three-tier dynamic sharing framework that contains a three-tier access licensing framework from license-exempt to exclusive use.[28]

United Kingdom: In the United Kingdom, the regulator (OFCOM) introduced a "Local Access License"[29] in 2019 which offers access to spectrum that has already been licensed to existing mobile network operators in locations where they are not using their spectrum.

Canada: The Canadian Regulator- Innovation, Science and Economic Development Canada (ISED) has issued a public consultation[30] to formulate a shared spectrum strategy that supports rural and remote deployments. The proposed strategy, seemingly similar to OFCOM's strategy, includes introduction of a new supplementary licensing process (Access Licensing framework) for licensed but unused spectrum.

South Africa: The Independent Communications Authority of South Africa (ICASA), has recognized the need to act on underutilized spectrum. Quoting from *2nd Information Memorandum*

> "to be shared with ECNS licensees in areas that spectrum is not utilized to stimulate competition, promote SMMEs and cooperatives, and ensure that the radio frequency spectrum is used efficiently in accordance with section 2 (f), (p) and (e) of the ECA, respectively."

The memorandum also provides for the sharing of spectrum licensed to primary spectrum holders in cases where the licensed spectrum is not fully utilized.

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[27] FCC: Citizens Band Radio Service (CBRS). April 13, 2017 <https://www.fcc.gov/wireless/bureau-divisions/mobility-division/citizens-band-radioservice-cbrs >

[28] FCC: Citizens Band Radio Service (CBRS) . April 13, 2017 <https://www.fcc.gov/wireless/bureau-divisions/mobility-division/citizens-band-radioservice-cbrs >

[29] OFCOM: Local Access Licence - Guidance document (2019) <https://www.ofcom.org.uk/__data/assets/pdf_file/0037/157888/localaccess-licence-guidance.pdf >

[30] Consultation on New Access Licensing Framework, Changes to Subordinate Licensing and White Space to Support Rural and Remote Deployment. August 2021 <https://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf11717.html>

"11.6.2 In cases where the spectrum is not fully utilized by the licensee within 5 years of issuance of the Radio Frequency Spectrum Licences, the Authority will initiate the process for the Licensee:

11.6.2.1 to share unused spectrum in all areas to ECNS licensees who may, inter alia, combine licensed spectrum in any innovative combinations in order to address local and rural connectivity in some municipalities including by entrepreneurial SMMEs;

11.6.2.2 to surrender the radio frequency spectrum licence or portion of the unused assigned spectrum in accordance with Radio Frequency Spectrum Regulations, 2015"

While five years may be an unnecessarily long timeframe, included most likely due to the established time period of 5 years meeting coverage obligations; the ICASA nonetheless recognized the *use-or-share* provisions for spectrum management.

Right to Exclusivity vs Right to Protection from Interference

The key to unlocking and opening up the access opportunities depends on how we frame IMT spectrum licenses (or, right to use spectrum). Historically, spectrum licenses have provided a guarantee of exclusivity of spectrum access across an entire service area. As such, any decision to share spectrum is then vested in the license holder who may not have significant incentive to share spectrum. A shift in approach began with the publication of a presidential report in the USA on Realizing the Full Potential of Government-Held Spectrum to Spur Economic Growth.[31] In this report, it was proposed that the *right to exclusivity* in spectrum licensing be transformed into a *right to protection from interference*. This subtle but profound change enables the regulator to implement spectrum sharing in a manner that preserves all the rights of the primary licensee but unlocks the potential of unused spectrum.

For instance, see clauses in in Section 4.2 of the OFCOM 800MHz and 2600MHz license[32] which states:

"4.2 For the avoidance of doubt the Licences will not guarantee exclusive use of the spectrum awarded. In the future we may grant additional authorizations to allow the use of all, or part, of the spectrum, including the spectrum that is the subject of this

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[31] Report to the President on Realizing the Full Potential of Government-Held Spectrum to Spur Economic Growth. Executive Office of the President. *President's Council of Advisors on Science and Technology.* July 2012 <https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/pcast_spectrum_report_final_july_20_2012.pdf >

[32] OFCOM: The award of 800 MHz and 2.6 GHz spectrum Information Memorandum. July 2012 <https://www.ofcom.org.uk/__data/assets/pdf_file/0022/32872/im.pdf >

Award Process. We would develop and consult on the conditions of use under any such additional authorizations in order to manage the risk of harmful interference."

Yet, another instance can be found in the renewal of the PCS license[33] in Mexico:

"8.6. Services for secondary use. The Institute reserves the right to grant other authorizations for the use, development and exploitation of the frequency bands that are the subject of this Radio Spectrum concession, or portions thereof, for secondary use. In such cases, the use of the bands subject to this Radio Spectrum concession shall be protected against harmful interference. "

Clauses such as this extend spectrum sharing beyond generic sharing frameworks as they have in the UK with the Local License framework and in Mexico where the regulator has set aside spectrum for underserved regions.

Clauses such as the above enable a "use-it-or-share-it" approach to spectrum licensing. This contrasts with "use-it-or-lose-it" policies, as mentioned previously, which have proven challenging to implement given the significant sunk costs of the licensees.

Conclusion

In conclusion, we recommend the TRAI to develop–and recommend to the Department of Telecom, "use-it-or-share-it" provisions for spectrum licenses (or, right to use). We believe that license provisions that guarantee the license holder the *right to protection from interference* as opposed to *absolute exclusivity* are better suited to achieve the efficient use of spectrum as well as more affordable access to communications in underserved regions. These provisions which aim for digital inclusion in the spectrum, can be a precursor to an enabling environment for greater digital inclusion in India. We encourage TRAI to follow up on these provisions with a national consultation on shared access to spectrum in underserved regions. Furthermore, the current consultation appears focused on commercial TSPs, much like the practice in some of the other jurisdictions. However, if we are to bridge the rural-urban digital divide, TRAI should also recognize other types of operators that may be better suited to provide affordable, quality broadband internet connectivity to rural areas. This would include local entrepreneurs, community networks, cooperatives, among others. Locally owned non-profit operators may be better suited to creating affordable,

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[33] <https://rpc.ift.org.mx/vrpc//pdfs/68531_190715125729_364.pdf> Original text in Spanish. "8.6. Servicios para uso secundario. El Instituto se reserva el derecho de otorgar otras autorizaciones para el uso, aprovechamiento y explotación de las bandas de frecuencias objeto de la presente concesión de Espectro Radioeléctrico, o porciones de las mismas, para uso secundario. En tal caso, el uso de las bandas materia de esta concesión de Espectro Radioeléctrico contarán con protección contra interferencias perjudiciales."

sustainable access in these areas. We encourage TRAI to recognize non-profit operators in the context of this consultation.[34]

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[34] Joint Internet Society and Mozilla Response to Innovation, Science and Economic Development's (ISED) Consultation on New Access Licensing Framework, Changes to Subordinate Licensing and White Space to Support Rural and Remote Deployment. <https://policy.communitynetworks.group/_media/public-consultation/2021-10-26_submission-mozilla-isoc-spectrum_final.pdf>

Responses to specific questions

Q14. Whether there is a need to explore putting in place a regime to implement Authorised Shared Access (ASA), wherein an access service provider as a secondary user could use the frequency spectrum assigned to a non-TSP primary user (government agencies and other entities) on a dynamic spectrum sharing basis? Kindly justify your response.

We believe that use-it-or-share-it principles in spectrum license are essential to ensuring affordable access in underserved regions.

Q15. In case it is decided to implement ASA technique for secondary use of frequency spectrum assigned to non-TSP primary users, please provide your response to the following questions with detailed justification:

(a) What are the potential spectrum bands in which ASA implementation can be considered?

No comments

(b) What measures should be taken to encourage and motivate the incumbent users for participation in the spectrum sharing through ASA technique?

No comments

(c) What should be the broad framework for implementation of ASA technique?

Automated, database-driven, secondary assignment of spectrum; such as has been implemented with Citizen Broadband Radio Service (CBRS) in the United States may be a desirable outcome in the longer term but it is not necessary and may even be counter-productive in the near term due to the complexity of implementation. We believe that the more manual approach developed by OFCOM in the UK, which places mediation for spectrum sharing firmly in the hands of the regulator is a better strategy which can be a learning platform for the evolution of this kind of regulation. We also believe the low fees associated with OFCOM's approach is essential to stimulating innovation in shared spectrum use.

(d) Is there a need for putting in place a mechanism for dispute handling including interference issues in case of ASA? If yes, what should be the framework?

Telecom Disputes Settlement and Appellate Tribunal (TDSAT) may be empowered to handle disputes emanating from interference issues in case of ASA. Currently, the TDSAT is the first body which looks into any dispute between two (i) telecom operators, (ii) telecom operators and the government, and (iii) between operators, the government and as well as the regulator. Once an ASA regime is put in place it may be prudent to expand the scope of TDSAT to include disputes emanating from an ASA regime.

(e) What methodology should be adopted for spectrum assignment to secondary users? Broadly, a First come first served license assignment process may be the most suited for implementation of ASA.

(f) What could be the spectrum charging mechanism for such assignment?

No comments.

(g) Who should be entrusted the work of managing shared access of spectrum?

TRAI should be entrusted with the management of shared access of spectrum. At present TRAI only has recommendatory powers over spectrum assignment. Whereas regulators such as the Federal Communications Commission (FCC) of the USA, OFCOM of the UK, and regulators in Pakistan, Bangladesh, and Sri Lanka have powers over spectrum and licensing. Considering TRAI is a sector regulator having the skills to deal with technical matters pertaining to telecommunications, it is advised that this responsibility should be delegated to TRAI.

Q16. Whether there is a need to permit the ASA technique-based dynamic spectrum sharing among access service providers? If yes,

(a) What are the possible regulatory issues involved and what could be the possible solutions?

No comments.

(b) What measures should be put in place to avoid any adverse impact on competition and dynamics of spectrum auction? Kindly justify your response.

ASA should only be made available to those operators who do not already hold any spectrum in that particular service area in order to ensure new and local operators get an opportunity.

Since the number of TSPs has reduced to four, the government must also recognize local entrepreneurs, not for profit operators, community networks who may be better suited to serve rural markets. The focus of this needs to be broadened beyond the existing TSPs, especially to bridge the digital divide.

Q17. In case it is decided to permit ASA technique-based dynamic spectrum sharing among access service providers in the country, please provide your response to the following questions with justification:

(a) Whether there is a need for prescribing any framework for such shared use? If yes, what should be the framework?

No comments

(b) Whether access service providers should be required to obtain approval or intimate to DoT before entering into such arrangement?

No comments

(c) Whether any fee (one time, or recurring), should be prescribed on the spectrum sharing party(ies)? If yes, what should be the fee and who should be liable to pay such fee?

No comments

(d) What should be the treatment of spectrum shared through ASA technique for the purpose of computation of spectrum cap?

No comments

(e) Whether there is a need for an independent entity for managing spectrum access? If yes, who should be entrusted this work? If not, how should the spectrum access be managed?

No comments

(f) Is there a need for putting in place a mechanism for dispute handling including interference issues or should it be left to the access service providers? If yes, what should be the framework?

No comments

(g) What other terms and conditions should be applicable for the sharing parties?

No comments

Q18. Suggestions on any other spectrum sharing technique(s), which needs to be explored to be implemented in India, may kindly be made along with the relevant details and international practice. Details of likely regulatory issues with possible solutions, interference management, dispute handling etc. may also be provided.

No comments