

## **BIF Response to TRAI Consultation Paper on Telecommunication Infrastructure Sharing, Spectrum Sharing, and Spectrum Leasing**

### **A. Issues relating to Infrastructure sharing**

**Q1. Should passive infrastructure sharing be permitted across all telecommunication service licenses / authorizations? Kindly justify your response.**

In principle, the passive infrastructure sharing should be permitted in same manner, i.e. without any differentiation, across all telecommunication service licenses/ authorizations. Buildings, sites, towers, ducts, dark fibre etc. are required to be shared between all kinds of licenses/ authorizations and there is no reason for different treatment.

At broad level, reduction in the deployment costs and maintenance costs is critical for providing affordable services to customers. Thus, the same should not be constrained by the license conditions, provided adequate competition exists in the market and alternate service delivery means are available in case of disasters.

For the same reason, there is no reason to differentiate against the ISPs (under UL(VNO) Authorizations or under ISP Licensees), Audio Conferencing/Audiotex /Voice Mail operators and some other types of licensees as regard to sharing of passive infrastructure.

This will also help IP-1s and infrastructure providers to spread the risk by having contracts with more players and better monetisation of infrastructure.

Further, for arrangements with the IP-1s, telecommunication service licenses/ authorisations should not be differentiated by regulations or by licensing conditions.

Thus, we submit as follows:

- a. Passive infrastructure sharing be permitted across all telecommunication service licenses / authorizations. Accordingly, the passive infra structure sharing conditions should be same, i.e. providing for sharing to and from all types of licensees/authorisations and from IP-1s, in all types of authorisations under UL /UL(VNO) licensees and any UASL, CMPSP, ISP licensees and any other kind of license.

The license conditions in all licenses/authorisations should be same with regard to passive infrastructure sharing for both scenarios i.e. among any kind of telecommunication service licenses/ authorizations (including GMPCS, PMRTS, Audio Conferencing/Audiotex /Voice Mail, UL-VNO(ISP)) and/or with respect to IP-1s.

- b. The respective guidelines should also be made uniform in this respect, particularly 2002 and 2007 guidelines in respect of ISP licenses.
- c. For arrangements with the IP-1s, telecommunication service licenses/ authorisations should not be differentiated by regulations or by licensing conditions.
- d. In our view telecommunication service licenses/ authorizations and/or IP-1, which are owners of passive infrastructure should be further permitted to monetise the infrastructure by sharing it with even non-telecom players, wherever it is possible. The same should be specifically provided in all the authorisations under UL/UL(VNO) and any UASL, CMPSP, ISP licenses and any other kind licenses.
- e. There should be adequate checks in the license to ensure availability of alternate networks or adequate passive infrastructure (e.g. DGs, fibre cables, manpower) to ensure continuity of telecom services in situations of disaster.
- f. The licensor and the regulator should also always consider that competition is not lessened due to infrastructure sharing in the manner that it may increase the barriers to entry for new operators or increase prices.

**Q2. Should other active infrastructure elements deployed by service providers under various licenses/ authorizations, which are not permitted to be shared at present, be permitted to be shared among licensees of telecommunication services?**

In respect of Access Services, other active sharing elements deployed (I.e. core network elements) under UASL/CMTS/UL/UL(VNO) are not permitted to be shared at present.

It is noted from the consultation paper that COAI through its letter dated 04.01.2022 addressed to DoT with a copy to TRAI, informed that COAI has deliberated the issue internally with its members and, at present, it does not wish to pursue the subject of core network elements any further.

The consultation paper further states that in case sharing of all the network elements across all licenses/ authorizations is permitted, there is a possibility that sufficient infrastructure may not be created and there could be a high level of dependency on shared network elements and any failure in the shared network elements, particularly the core network elements, could become a single point of failure and may affect services of all TSPs which are involved in sharing.

The proportionate cost of core network elements is quite less compared to costs of other network elements including RAN, M-MIMO, backhaul etc. Though core network has much lower cost compared to other network elements, however, it is its

enhanced capabilities of network slicing, open platform and greater business agility and flexibility that makes the core enhancements especially valuable. Core network sharing is less common as it may provide very less delta on savings and results in limited possibilities to differentiate services and strategy, which decreases its attractiveness from operator perspective.

In India, the sharing of core network elements has not been permitted till date. Even when the mobile access service market structure was fragmented and there were as many as 12-14 players, the same was not allowed. The benefits, even though a small delta, of such sharing at that time might have been there with the risk of failure minimised and distributed considering the number of operators and number of networks. Today's market structure of access services is however quite different and highly concentrated.

The required parameters like network resilience, innovation and choice to users should not suffer due to sharing of core network elements in any situation.

In view of the above, other active infrastructure elements (core networks) deployed by access service providers under respective licenses/ authorizations, should not be permitted to be shared among licensees of telecommunication services.

**Q3. If your response to the Q2 is in the negative, which active infrastructure elements should not be permitted to be shared? Further, which active infrastructure elements should be permitted to be shared with which licenses/ authorization holders? kindly provide details for each authorization with detailed justification.**

For the reasons given in answer to question 2, none of the core network elements active infrastructure elements should be permitted to be shared between access providers.

The access elements, WiFi routers and backhaul should be permitted to be shared across all licenses /authorisations.

**Q4. In case it is decided to permit sharing of any additional active infrastructure elements among licensees,**

**(a) What precautionary conditions should be put in place to avoid disruption in telecommunication services due to any unforeseen situation? The response may be provided for each active infrastructure element.**

**(b) Whether there is a need to have a provision for permission from/ intimation to the Licensor before commencement of such sharing? If yes, what provisions and timelines need to be prescribed for each active infrastructure element?**

It is submitted that sharing of additional active infrastructure elements, i.e. the core network elements, amongst access service licenses/authorisations should not be permitted due to reasons given in answer to question number 2 above.

**Q5. Whether any other amendment is required to be made in the telecommunication services licenses/ authorizations with respect to the provisions relating to both active and passive infrastructure sharing to bring clarity and remove anomaly? If yes, clause-wise suggestions in the telecommunication services licenses/ authorizations may kindly be made with detailed justification.**

In our view, the conditions permitting passive sharing should be provided in Part I of the UL or UL VNO license, which will apply to all the authorisations under the UL license.

In case of Access / Internet Service licenses/authorisations, considering the requirement of ubiquitous voice and data network inside the large public places/ commercial complexes/ residential complexes and considering the fact that it is not practical for each TSP to put its IBS and other telecom infrastructure inside such complexes, the requirement of sharing the in-building telecom infrastructure including IBS should be mandated with a non-discriminatory process on the lines recommended by TRAI in recommendations on 'In-Building Access by Telecom Service Providers' dated 20.02.2017

**Q6. Should there be any obligation on telecom service providers to share infrastructure that has been funded, either partially or fully, by the Government through Universal Service Obligation (USO) Fund or otherwise, with other telecom service providers? Kindly justify your response.**

**Q7. In case it is decided to impose some obligations on telecom service providers to share the infrastructure funded by Government with other telecom service providers, is there a need to provide a broad framework for sharing of such infrastructure? If yes, kindly suggest the key aspects of such framework with detailed justification.**

The USO Fund projects are assigned to TSPs mainly on tender basis. In the case of tender to award project/ scheme, the evaluation of bids is carried out based on the least quoted total subsidy that will be provided from the USOF. The Consultation Paper too mentions that the work related to the provision of mobile services in the identified areas are generally awarded through open competitive bidding process. In light of this, in case of existing commercial agreements under USO Fund, adding obligations in an existing contract for mandatorily providing infrastructure sharing to other licensees /service providers may raise legal concerns and hence not feasible.

In the future tenders, having partial or full funding of a TSP by the Government through USO Fund or otherwise, it may be desirable to prescribe an obligation of sharing part of the infrastructure that is so funded. However, the structuring of the

respective terms and conditions will depend on the nature of each tender. In such cases a Reference Infrastructure Sharing Agreement, with commercials, may be made part of the tender condition itself.

Further, the framework of the tenders under USO Fund, prescribing infrastructure sharing, can successfully deliver, if and only if, the other TSPs seek such infrastructure sharing to provide their services. In case there is no such seeker, then the overall cost of service provisioning should not result in increase in viability gaps and non-delivery of service. Therefore, the tenders will need to consider such aspects. However, assuming that the reach of service and wider coverage, being critical criteria of the competition, there should be an uptake in infrastructure sharing in some remote area with Reference Infrastructure Sharing Agreement being inbuilt in the USOF tender.

**Q8. Any other suggestion to facilitate infrastructure sharing may kindly be made with proper explanation and justification.**

To have project viability more attractive and to enable services to reach users, there is a need to attract more players towards USO projects and it may be desirable to invite tenders from two or more TSPs jointly with infrastructure sharing between them inbuilt in the tender.

### **B. Connectivity Issues Faced by the Subscribers in Remote and Far-flung Areas of the Country**

**Q9. What measures could be taken to encourage roaming arrangements among telecom service providers in remote and far-flung areas? What could be the associated regulatory concerns and what steps could be taken to address such concerns? Kindly provide details on each of the suggested measures with justification.**

While infrastructure sharing is an input to build the networks, roaming is an output of a network through which services can be availed by subscribers of other networks.

Roaming helps in getting more output from existing resources in terms of usage and active subscribers and is a big asset to mobile users who may be disconnected considering lack of service coverage by the home network in a particular area.

There is no doubt that roaming should be encouraged among telecom service providers in remote and far flung areas. This will provide connectivity to more telecom users.

Considering that roaming is a mutual agreement between provider and seeker, it is imperative that the framework for the new tenders itself should encourage roaming.

Our broad suggestion is that there should be a clause dealing with a Reference Roaming Agreement in the tender itself, seeking expected year wise volume of

roaming traffic and expected wholesale revenues with respect to one seeker or two seekers. This will also result in obligation on the successful bidder of USOF tender to enter into roaming agreements if the Reference Roaming Agreement's conditions are agreed to be other operators.

In case the roaming agreements are entered into, then the provider, who is the successful bidder for USOF tender, should not be charged license fee at least for some years (the period may be decided) on the respective roaming revenue earned by it from other operators.

In existing USOF agreements, where amendments can be made only with mutual consent (if feasible under tender conditions), license fee waiver on the roaming revenue earned from the sites under USOF can be given as incentive to the provider for certain period.

It must be also noted that the satellite industry is best positioned to promote connectivity in areas that lack essential access to fast and reliable communications networks. Satellites can be ideal for providing remote connectivity solutions, and to contribute in bridging the digital divide in the country.

**Q10. What could be the other ways to ease out the hardship faced by the subscribers in remote and far-flung areas due to connectivity issues of the home network provider? Kindly provide detailed response with justification.**

One of the other ways to ease out the hardship faced by subscribers in remote and far flung areas due to connectivity issues of the home network, is to either encourage or mandate (in future tenders) the respective telecom service provider to open a certain number of Public WiFi hotspots or enter into tie ups for PM WANI based WiFi. This will, to some extent, improve the revenues of the said telecom service provider and ease out hardship of some subscribers in far flung areas.

Coverage of rural & remote areas, even where coverage of existing networks may be there, can be more efficiently met by local and niche players (VNOs/MVNOs) as compared to the large Pan-India access service providers (UL licensees). Mobile VNOs (MVNOs) can play a role here, provided there are regulatory directions to Telcos to enter into arrangements with VNOs/MVNOs for last mile coverage and for reselling bandwidth in niche areas as well as to allow multi-operator parenting for the VNOs/MVNOs so that they may provide quality services to their customers in the local service areas. As of now, there are no operating /flourishing MVNOs, despite over 600 licenses been granted.

**C. Issues relating to inter-band spectrum sharing among access service providers**

**Q11. Whether inter-band access spectrum sharing among the access service providers should be permitted in the country?**

The Consultation Paper states that under inter-band spectrum sharing, two or more TSPs holding frequency spectrum in different spectrum bands, pool their frequency spectrum and use inter-band carrier aggregation. It mentions that permitting inter-band spectrum sharing might also work as a facilitator in active infrastructure sharing while, on the other hand, as the number of TSPs in the wireless access services segment has reduced to four, it needs to be examined as to what could be its effect on competition and dynamics of auction of spectrum.

Inter-band access spectrum sharing, from the technology perspective, should be favoured. Since 2015, spectrum sharing in India is in existence with the sole objective of enhancing spectral efficiency by combining/pooling the spectrum holding and inter-band sharing would be logical extension in same direction and it will be consistent with the objective of further efficient utilisation of spectrum and will lead to better QoS and wider coverage.

Intra-band sharing is already allowed under 'Guidelines for Sharing of Access Spectrum by Access Service Providers' on 24.09.2015. These guidelines have been amended from time to time. At present, the amended 'Guidelines for Sharing of Access Spectrum' were issued on 11.10.2021 are in force. The following basic conditions on spectrum sharing in these Guidelines, which may hold good for inter-band sharing, will require due consideration in the present context of a concentrated market:

- Both the operators possess auctioned spectrum/spectrum for which market price has been paid;
- There will be at least two independent networks provided in the same band; and
- Pre-requisite that all license conditions are complied with.

We wish to submit that inter-band spectrum sharing maybe permitted subject to safeguards being provided to ensure that the market remains adequately competitive to address requirements based on HHI Index, Market Concentration Ratio & keeping independent networks (for disaster management)

Regarding spectrum sharing, we also wish to submit that TRAI should consider the critical difference between the way spectrum is assigned for satellite use and assignments of spectrum for use by terrestrial networks. Satellite operators and service providers share spectrum in an effective manner by using the same frequencies across multiple satellites, satellite systems, and earth stations. Any fragmentation of the spectrum used to provide satellite services and to make exclusive assignments unequivocally results in a loss of satellite capacity, thus making unviable the provision of satellite services. On the other hand, auctioning of spectrum used by satellite operators and service providers on a shared basis would not add any value and lead to needless fragmentation of the spectrum thereby reducing the efficiency of utilization of spectrum and thereby its yield.

Indeed, we note the concerns that shared use of spectrum causes a loss of revenue to the government and leads to a waste of scarce natural resources (spectrum) simply do not apply to satellite-based services. On the contrary, the sharing of spectrum that takes place among satellite operators and service providers should be valued by the authorities as a means for India to achieve a leading position in the space technology sector, thereby accelerating the availability of quality education and remote healthcare, and enabling the overall growth & development of rural and remote parts of the country.

The technical, economical and public interest aspects that explain why the auction of spectrum for satellite services has not been adopted by the majority of the countries around the world as an assignment mechanism, should provide a good reason of why India should continue to promote the sharing of spectrum among satellite operators and service providers, as well as to maintain the administrative assignment model for spectrum used by satellite operators and service providers to ensure there are no delays to enabling increased connectivity in rural and remote parts of India through High Throughput Satellite (HTS) and Very High Throughput Satellite (VHTS) networks, both in geostationary and non-geo-stationary orbits.

The assignment of spectrum for satellite services certainly qualifies for the administrative process route, out of necessity. It is the norm, not the exception, and a practice that is followed by administrations around the world. We humbly request the operator to recommend the same in India as well.

**Q12. In case it is decided to permit inter-band access spectrum sharing among access service providers, please provide detailed inputs to the following questions:**

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

**(b) Considering that surrender of spectrum has been permitted in the country, what provisions need to be included in the guidelines for inter-band access spectrum sharing so that any possible misuse by the licensees could be avoided? Kindly justify your response.**

**(c) What should be the broad framework for inter-band access spectrum sharing? Whether the procedure prescribed for intra-band access spectrum sharing could be made applicable to inter-band access spectrum sharing as well, or certain changes are required to be made?**



**(d) What should be the associated charges, and terms & conditions for inter-band access spectrum sharing?**

**Q13. Any other issues/ suggestions relevant to the spectrum sharing between access service providers, may be submitted with proper explanation and justification.**

It is submitted that there should be at least 3-4 financially strong players in mobile access market and any regulatory intervention like spectrum sharing should primarily be done keeping in view that market should remain adequately competitive to address requirements based on HHI Index, Market Concentration Ratio and by keeping independent networks. Key aspects of a healthy competition in the mobile access market, including interventions enabling MVNOs to operate and flourish and attracting investments in the sector from more players need urgent attention. Additionally, the spectrum shared should be included in the statutory spectrum cap of both the sharing licensees.

#### **D. Issues relating to Authorised Shared Access (ASA) of Spectrum**

**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.**

**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?**
- (b) What measures should be taken to encourage and motivate the incumbent users for participation in the spectrum sharing through ASA technique**
- (c) What should be the broad framework for implementation of ASA technique?**
- (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?**
- (e) What methodology should be adopted for spectrum assignment to secondary users? What could be the spectrum charging mechanism for such assignment?**
- (f) Who should be entrusted the work of managing shared access of spectrum?**

**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?**

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

**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?

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

(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?

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

(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?

(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?

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

**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.**

The Consultation Paper states that certain quantum of the globally harmonized spectrum bands for IMT services has been assigned/ earmarked for Government use and/ or other services. However, the spectrum so assigned/ earmarked may not be utilized efficiently (entire spectrum, at all places, at all times may not be in use).

We submit that 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.

It is respectfully submitted to enable us to provide a more qualified answer, further details of spectrum from Govt. agencies like Railways and Defence may be required to make an informed response on modalities of sharing.

The consultation paper itself states that identifying the frequency bands, which are not directly available (partially or entirely) to access service providers for IMT use, is the first step towards adoption of authorized shared access (ASA) of spectrum for secondary use in the country. Further, the biggest challenge would be that the incumbents, who have exclusive right to use a frequency band, may not be willing to implement ASA based spectrum sharing, as they may have apprehensions regarding interference from secondary users. Therefore, the above information will be required to be collected and needs and concerns of the incumbents will need to be assessed in first stage to enable informed discussion.

We submit that spectrum used by access service providers is acquired through auction or is liberalised, by paying market price, for technology neutral use for services like 3G, 4G & 5G. The spectrum given to incumbents (non-TSP primary user) is allocated administratively. Thus, if the secondary user under ASA is a mobile access provider then even for such secondary use there should be some suitable assignment mechanism for secondary use. As mentioned above, the details as to how the spectrum can be optimally shared without causing harmful interference to each other can only be worked if the availability of such spectrum and concerns of the primary users are known.

## **E. Issues relating to Leasing of Spectrum**

**Q19. Where there is a need to permit spectrum leasing among access service providers? Kindly justify your response.**

**Q20. In case it is decided to permit spectrum leasing among access service providers, please provide detailed response to the following questions:**

**(a) Whether spectrum leasing should be permitted for short-term period only, or for both short-term as well as long-term?**

**(b) In case only short-term leasing is to be permitted, what should be the maximum duration for such spectrum leasing? Should there be any restrictions on renewal of such short-term lease?**

**(c) In case it is decided to permit long term leasing, please provide your response to the following questions with justification:**

**(i) What measures should be put in place to avoid any adverse impact on competition and dynamics of spectrum auction?**

**(ii) Whether there should be a maximum duration for which spectrum leasing may be permitted?**

(d) What should be the applicable roll-out obligations for the Lessee (the access service provider which takes spectrum through leasing arrangement from the Lessor)? Whether the spectrum leasing should have any effect on the roll-out obligations applicable for the Lessor (the access service provider which has leased out the spectrum)? Whether the provisions for roll-out obligation require to be different for short-term and long-term spectrum leasing?

(e) Should the spectrum leasing charges be levied on similar lines as applicable for spectrum trading? If no, what charges should be made applicable in case of spectrum leasing?

(f) Should there be a lock-in period, after acquisition of spectrum, to become eligible for spectrum leasing as applicable in spectrum trading? If yes, what should be the lock-in period post which, spectrum holder would become eligible to lease it to another access service provider?

(g) Whether there is a need for an approval from, or intimation to DoT before the proposed leasing of spectrum? If yes, whether prior approval/ prior intimation requirement be different for long-term and short-term spectrum leasing? What should be the timelines for approval from, or intimation to DoT in each case?

(h) Whether the spectrum held by an access service provider on short-term, or long-term lease be included to calculate compliance to spectrum caps?

(i) Considering that surrender of spectrum has been permitted in the country, what provisions need to be created in the guidelines for leasing of spectrum between access service providers so that any possible misuse by the licensees could be avoided?

(j) What other terms and conditions need to be prescribed in respect of spectrum leasing between access service providers?

Considering that spectrum trading is permitted, spectrum leasing can also be permitted for secondary market requirements, subject to adequate safeguards being provided to ensure that competition is neither restricted nor reduced. These safeguards should take into account the HHI Index, Market Concentration Ratio and by ensuring that independent networks exist.

**Q21. Any other issues/ suggestions relevant to the spectrum leasing, may be submitted with proper explanation and justification.**

None.