

## **BIF RESPONSE TO TRAI CP ON USE OF STREET FURNITURE FOR SMALL CELL AND AERIAL FIBER DEPLOYMENT**

### **PREAMBLE**

1. 5G is a completely different technology and requires a different approach than 2G, 3G and 4G. 5G uses higher radio frequencies that are less cluttered. This allows for it to carry more information at a much faster rate. While higher bands are faster at carrying information, there can be problems with sending over large distances. They are easily blocked by physical objects such as trees and buildings. In order to circumvent this challenge, 5G will utilize multiple input and output antennae to boost signals and capacity across the wireless network. For these features of 5G, small cells are required and their deployment assumes special importance.
2. Use of street furniture such as electricity poles, billboards, smart poles and traffic lights for deployment of small cells can enable faster roll-out, save capital expenditure and energy costs, provide better coverage in denser areas and improve delivery and quality of services.
3. To improve the optical fiber coverage in the country, aerial fiber deployed on street furniture can be a viable solution for quickly providing reliable high-speed fiber backhaul to small and macro sites.
4. To enable the use of street furniture for small cells and aerial fiber, there is a need to ensure ease of deployment and have simplified right of way rules related to procedure and charges for deployment or renting the street furniture. Further, sharing of the street furniture amongst various users, permissions needed for power supply under state electricity laws, exemptions or bulk permissions for small cell deployment, etc. will also be required to be laid down and simplified.

**Q1: Is there a requirement for any modification in existing RoW Rules as notified by DoT to accommodate small cell deployment on street furniture? If yes, please provide the changes required.**

### **BIF RESPONSE**

- A. Yes. The Current RoW Rules are more aligned for Outdoor Towers and underground (UG) Fiber and not suitable for use of street furniture viz. lampposts, electric poles, etc. for housing small cells, which will be so essential for ensuring high capacity connectivity in dense urban areas.
- B. Suitable provisions must be made in the Central RoW Rules to include instant or fast one-time bulk permissions (preferably within 7 days) at zero cost (or at a very nominal one-time cost) to utilise street and public infrastructure.

**Q.2: Have the amendments issued in 2021 to RoW rules 2016 been able to take care of the needs of aerial fiber deployment? If not, what further amendments can be suggested? Please provide exact text with justification.**

**BIF RESPONSE**

- A. While the amendments to the RoW Rules issued in 2021 by and large takes care of the needs for deployment of aerial fiber, it is felt that some separate specific provisions are needed for specific needs or use cases, where further necessary amendments to the extant rules will be required to be issued.
  
- B. No **specific provisions** are present in the majority of the RoW policies of various States/UTs for seeking permissions for deployment of small cells at public places. The **process of the permissions, RoW charges** for the use of street furniture and laying of aerial fiber are not uniform, and vary quite significantly across the different states. The variations in the fees imposed by each of these states, Local bodies (i.e. Municipal Corporations), suggest that there is a need to ensure that all states are aligned with the Central RoW rules, and the process for the same along with the charges are uniformly aligned. While some of the states like Madhya Pradesh, Chhattisgarh, Bihar and Orissa have proactively come out with very less charges for granting RoW permissions and are charging around Rs. 100 per pole per annum for aerial OFC deployment, some others are charging prohibitive fees impacting rollout of digital infrastructure there. The excessive and non-uniform fees levied at various stages of RoW permissions across different states, if made applicable for small cells that will be deployed in hundreds of thousands in numbers, will hugely increase the capital expenditure and operational expenditure of the service providers, thereby seriously hampering the roll out of next generation networks.
  
- C. The states need to ensure that the street furniture available with them is readily made available for use for mounting small cells. Administrative authorities in-charge of the street furniture must look at the socio-economic benefit that digital infrastructure brings to the state and should, therefore, fix minimal charges for deployment of common sharable digital infrastructure on street furniture.

**Q.3: What are the suggestions of stakeholders for aligning RoW policies issued by various other Central Government Bodies with existing DoT RoW policy?**

**BIF RESPONSE**

- A. Since small cells are expected to be deployed in large number using different street furniture equipment, obtaining permission for each cell site and from different tiers of

authorities/bodies can be tedious. Accordingly, there is a need for simplifying the RoW process and come out with alternate ways and means viz.

- i. One possibility is the development of an online bulk approval process. Inclusion of small cells under a simplified rule system/RoW based on standardized size, installation, and deployment specifications, in place of the present practice of multiple approvals for building/street furniture permits is suggested for a faster and streamlined approval process.
  - ii. Identifying and cataloguing the diversity of suitable street furniture across the country and earmarking certain public infrastructure (Electricity poles, municipality buildings, post offices, bus and railway stations, etc.) to have dedicated spaces that allow service providers to deploy small-cell architecture, can ease the administrative process for local authorities. The Service/Infrastructure Providers will not be required to take separate individual permissions for use of such spaces, but will intimate the concerned authorities about usage of the same. They can rather pay the desired rentals and use these spaces for deploying small cells.
  - iii. Another approach adopted in certain countries viz. Japan and South Korea, is where traffic signals, metro lines, etc. were identified as street furniture in regions where they were highly concentrated and were mandated for use for deployment of small cells.
- B. Mandatorily allowing such street furniture for deploying small cells on sharing basis at fixed nominal rentals will ease the approval process.** The Service/Infrastructure Providers may not apply for individual site permissions and can simply intimate and deploy the small cells on identified street furniture and pay fixed nominal rentals.
- C. The RoW Rules 2016 clearly defines the applicability of the rules as *“Applicability- The appropriate authority shall exercise the powers under these rules on an application for establishment and maintenance of underground or overground telegraph infrastructure by any licensee on whom the powers of the telegraph authority have been conferred by notification under section 19B of the Act, subject to any conditions and restrictions as may be imposed in such notification.”* The rules further define *“appropriate authority”* means the Central Government, respective State Governments, local authority or such authority, body, company, or institution incorporated or established by the Central Government or the State Government, in respect of property, under, over, along, across, in or upon which underground or overground telegraph infrastructure, is to be established or maintained, vested in, or under, the control or management of such appropriate authority.**
- D. From these clauses, the rules appear to fully cover Central Government departments and their entities. Despite that, other Central Government bodies and agencies viz.**

metro stations, defence cantonment, airports, bus stops, railway stations etc., all levy exorbitant rental charges, remarkably high annual increments in rental charges, additional miscellaneous charges, and huge security deposits. In addition to these charges, onerous conditions (like non-refund of deposits in case of cancellation of site due to reasons not in control of applicant) are imposed by some authorities. For faster and cost-effective rollout of small cells and future technologies, they are required to be aligned to the Central RoW Rules.

**Q.4: Whether it should be mandated that certain public infrastructure (municipality buildings, post offices, bus, and railway stations, etc.) be earmarked to have dedicated spaces that allow service providers to deploy macro/small cells? If yes, what are the possibilities and under what legal framework this can be done? What should be the terms and conditions of use of such infrastructure? Please provide detailed inputs with justifications.**

#### **BIF RESPONSE**

- A. Yes. Certain pre-designated Public Infrastructure viz. designated Government buildings, airports, metros, bus stops, post offices, railway stations, etc. should be earmarked to provide dedicated spaces inside them for mounting/housing macro/small/pico cells on sharing basis. The current RoW Rules, both at the Central level and at the State level, must be suitably amended to reflect this. The amended Rules should also enable smooth, easy and low cost access to all possible public infrastructure and should be uniformly applicable everywhere.
- B. The designated infrastructure should be permitted on a mandatory sharing basis.

**Q.5: Can some of the street furniture like traffic lights, metro pillars etc be earmarked for mandatory sharing between controlling administrative authority and Telecom Service/Infrastructure providers for deployment of small cells and aerial fiber? Does existing legal framework support such mandating? What should be the terms and conditions of such sharing? Please provide details**

#### **BIF RESPONSE**

- A. Yes. In view of the fact that sharing of passive infrastructure has led to reduction in costs to the extent of approx. 30-40%, and increase in productivity and capacity utilisation to the extent of approx. 35-40%, sharing of public infrastructure and street furniture must be mandated. This sharing should be applicable between the controlling authority for the public infrastructure and the IP1s/TSPs who are involved in setting up the infrastructure for deployment of small cells and aerial fiber.

- B. Suitable amendments should be made in the current RoW Rules to mandate this for all Central Government bodies/entities and State Government bodies, including other Government Departments viz. Forests, Highways, Railways, etc.

**Q.6: How can infrastructure mutualization and infrastructure collaboration be ensured to avoid exclusive rights of way? What legal provisions can support mandating these? Provide full details**

**BIF RESPONSE**

- A. A World Bank study has recommended that for governments, sharing is an opportunity to expand the knowledge society faster and at lower costs. The study also recommends the need to augment the traditional model of asset sharing which is complemented by two new types of infrastructure sharing: infrastructure mutualization and infrastructure collaboration. Mutualization is sharing of a common infrastructure by all service providers, while collaborative infrastructures house different networks or are jointly constructed with other linear infrastructures, such as electricity lines or roads. Thus in this way, the Right of Way of street furniture could be on shareable basis and will enable exclusive Rights of Way to be avoided. Suitable provision in the existing RoW Rules through appropriate amendments is suggested to enable this framework.

**Q.7: Should there be permission exemption for deploying certain categories of small cells at all places or all categories of small cells at certain places (Like apartments etc.)? What legal framework will support such exemptions?**

**BIF RESPONSE**

- A. Yes. Since deployment of Small Cells and also aerial fiber (in places where UG Fiber is not available) is critical to ensure good QoS of Internet Connectivity, processes for giving permissions should be made simple - preferably online through a simple registration, instant (immediately granted) and should be exempted of any charges.
- B. As per international best practices, a few countries have also adopted criteria based on power emitted and deployment heights for giving exemption from permissions for deployment of small cells. In Australia, the Telecommunications (Low Impact Facilities) Determination 1997 deals with the mounting of antennas on existing buildings and structures without the scrutiny of State and Territory laws and Council approval if the facility satisfies the physical and locational characteristics to be called low impact.

- C. Since the power emission of small cells are lower compared to macrocells, it can be argued that for the cell sites which are installed at certain height clearances and emit lower than a specified power, a general declaration and certification of the equipment at a national/regional/local level can be accepted and they can be exempted from any additional permission.
- D. Product compliance and product installation compliance of the base station can be evaluated using a range of factors such as maximum radiated power, minimum loss between transmitter and passing people, and network performance (transmission and reception). In addition, different criteria may be applied for indoor versus outdoor installations operating at the same EIRP. Based on the technical documentation (transmitted power, typical antenna gains and compliance boundary dimensions) of the small cell designs, installation classes [a set of acceptable transmitter-mounting locations and permissible radiated powers (-36 EIRP) which have been calculated to comfortably ensure compliance with exposure limits] can be defined. Installation for these classes can be made eligible for permit exemption. IEC 62232 and ITU-T K10032 have defined base station installation classes that are applicable to small cells deployed in countries. Each installation class is based on simple criteria such as the equivalent isotropic radiated power (EIRP) of all equipment at the site or installation height
- E. Article 57 of the EECC of the EU provisions for the exemption of all kinds of buildings from permits, as long as the small cells satisfy certain conditions as spelt out by COMMISSION IMPLEMENTING REGULATION (EU) 2020/1070 of 20 July 2020. This document specifies the characteristics of small-area wireless access points pursuant to Article 57 paragraph 2 of Directive (EU) 2018/1972 of the European Parliament and the Council establishing the European Electronic Communications Code. Article 57 of the EECC provisions the right for operators to access any physical infrastructure controlled by national, regional or local public authorities, which is technically suitable to host "Small area wireless access points (SAWAP)" or which is necessary to connect such access points to a backbone network, including street furniture, such as light poles, street signs, traffic lights, billboards, bus and tramway stops, and metro stations.
- F. The regulation defines the physical and technical characteristics of small cells, setting strict limits on their size and power, exempting them from planning permits while retaining national oversight. Article 57 operates to prevent "competent authorities" (which would include, for example, local authorities) from making the deployment of small area wireless access points subject to any individual permit. Moreover, Member States must ensure that local and national authorities offer access to operators to street furniture (like lampposts and street signs) for the installation of wireless access points on fair, reasonable and non-discriminatory terms, with a single point of contact.

G. As the small cell use case expands to the residential and commercial areas, one of the major bottlenecks to deployment of small cells in such areas would be the restrictions imposed by the Resident Welfare Associations (RWAs) or private owners of the commercial spaces. The restrictions also take the form of exorbitant charges imposed for getting access to these places. **Ensuring the removal of such restrictions to the TSPs/IPs, following a no fee regime and employing the practice of deemed approval can be an option.** Given the background of the installation classes already defined by IEC 62232 Ed.2.0, there is a scope for India to adopt the internationally defined classes for its small cells similar to the adoption by the European Union.

**Q.8: What should be the criterion/ conditions (like power, height etc.) and administrative procedure for implementing such exemptions? Please provide exact text with detailed justifications**

**BIF RESPONSE**

A. India could possibly follow the EU Directives in this regard as described in Q7 above and outlined in great detail in the CP itself.

**Q.9: For Small Cells that do not fall under the exemption category, should there be a simplified administrative approval process (like bulk approvals etc.) for deployment? If yes, what should be the suggested process? If not, what should be the alternative approach?**

**BIF RESPONSE**

A. Yes. One time, Bulk approval/intimation route may be followed through a simple online process.

**Q.10: What power related problems are envisaged in deploying small cells on street furniture? Please provide full details.**

**BIF RESPONSE**

A. The following Power related issues for deploying small cells on street furniture are envisaged:

- i. Uninterrupted power supply is one of the primary requirements for functioning of small cells and therefore, street furniture like electric poles, bus shelters, billboards, gazebos, traffic lights that already have electric connection can be best suited to host small cells. This can be an economically efficient solution as no extra capital expenditure is required to make electricity provisions. However, some sort of power backup will be required to be hosted in the equipment that will be mounted on the street furniture.

- ii. For integrating the requirements in designs from the beginning would require collaboration with controlling administrative authorities (CAAs). This can save costs for the CAAs and TSPs/IPs. A well-integrated or camouflaged design will also improve overall aesthetics and reduce the visual pollution. For areas where electricity supply is disrupted or not available, installation of Solar Panels with battery backup can be an option. Not all Street Furniture may be suitable for installing solar panels due to additional wind loads.
- iii. Different small cell configurations have distinct physical categories and therefore, suitability of street furniture needs to be assessed for different type of small cell equipment.
- iv. Some of the DISCOMs do not allow giving separate connection or installing electricity meters on street furniture. Some DISCOMs do not treat the street furniture as a commercial address. Others have policy of giving one connection at one address and their processes or IT system do not allow installing another connection at the same street furniture location. Even subletting of existing power connection is not allowed by DISCOMs by installing submeters. All these problems will be required to be addressed. Pre-paid connections to street furniture can be a satisfactory solution.
- v. Further, to facilitate faster rollouts, the requirement of taking power connection on several poles or street furniture can be facilitated through process of bulk approvals. Further, DISCOMs can adopt One DISCOM-One Bill-One Payment policy for all Business users that use electricity connections at multiple locations including telecom sector service/infra providers.
- vi. Another issue is affordability of the power. State Electricity Regulatory Commissions prescribe different rates for commercial, industrial, utility, billboard, etc. connections. The rate for public utilities is Rs. 6.25/unit whereas the same for advertisement & hoardings is Rs. 8.50/unit. Commercial/ Billboard tariffs can affect the viability of a cell site. Telecom sites should be provided electricity connection under utility tariff. SERCs (State Electricity Regulatory Commissions) can be requested to incorporate the same in their tariff orders. In addition, electricity consumption at each telecom site can also be allowed to be aggregated and offset with green power (solar, wind, hydro, etc.) generated at distant locations. This will help in reducing the over-all carbon footprint for the sector.
- vii. Non availability of advance maintenance schedule is also a major issue. Hence, the same must be provisioned.
- viii. Information w.r.t. availability of electricity hours must be available to customer to plan back up accordingly.

**Q.11: What viable solutions are suggested to address these problems? Please provide full details.**

## **BIF RESPONSE**

Response to the Q has been provided in Q10 above.

**Q.12: Is there a need for standardizing the equipment or installation practices for next generation small cell deployment on street furniture? If yes, what are the suggested standards and what should be the institutional mechanisms for defining, and complying to them?**

## **BIF RESPONSE**

- A. Yes. There is a need for standardization of equipment/installation practices for small cells mounted on street furniture. For deploying small cells on street furniture, apart from obtaining right of way and ensuring availability of power, one must also look at suitability of the street furniture for mounting the equipment. Standardized designs can help control administrative authorities to easily assess the suitability of street furniture from point of view of load/wind bearing capabilities, ground/other installation clearances and aesthetics. Standardization of small cell equipment would not only aid in this aspect but will also help the TSPs/IPs to keep control and optimize resource utilization. Standard equipment designs can also help in gaining the trust of end-users by following proper functional aspects and ensuring QoS requirements.
- B. Presently, there are no guidelines for specific design requirements and standards that are required to ensure quality of performance, safety, aesthetic issues on the usage of small cells on street furniture. If the equipment used by the operators is to be approved and certified before site planning, the deployment of small cells at a large scale can be costly and time consuming. Therefore, the issue of a highly fragmented equipment ecosystem needs to be properly addressed. If standards for designs of small cell equipment are spelt out, this can help in easy acceptance of controlling administrative authorities and faster rollouts.
- C. Harmonization of standards and issue of the design guidelines to work across the small cell markets can benefit the TSPs and ISPs by reducing the Time to Market (TTM) for rolling out 5G services in India, and benefit controlling administrators by way of dealing with a simplified administrative process. The Small Cell Forum, in its various other reports over the years, also suggests broad solutions to tackle the above challenges. Still, there has been no consonant approach between countries on the design, specifications, or structure on which the small cell equipment might be installed.

**Q.13: Is there a need for a specific mechanism for collaboration among local bodies /agencies for deployment of small cells and aerial fiber using street furniture? If yes, what**

**mechanisms should be put in place for collaboration among various local bodies/agencies involved in the process of permissions with TSPs/IP1s and to deal with other aspects of Small Cell deployment?**

**BIF RESPONSE**

- A. Yes. There is a need for cross sectoral collaborations and institutional coordination. Faster and cost-effective deployment of small cells on street furniture would primarily depend on collaboration with CAAs, especially when using publicly owned sites. Each State/Union Territory has its own byelaws and processes. The deployment of small cells and aerial fiber on street furniture can be held back by a cumbersome and outmoded process. One of the primary problems for the deployment of small cells would be rules and processes which are not devised for the small cell equipment or with vast numbers of units in mind. The complexity of administrative processes such as identifying and approving a large number of sites, securing planning permissions and dealing with taxes and fees may vary largely across different regions.
- B. Small cell deployment on street furniture can make substantial progress only if the industry works in conjunction with regulatory bodies. Consequently, significant new approaches are needed in the regulatory and administrative processes which govern small cell deployments. Thus, it is essential to put in place cross sectoral collaborative and coordination mechanisms to adopt simplified, smoother, and streamlined procedures, or a unified permit regime so that small cells can be deployed at required pace and scale to deliver maximum benefits.
- C. National and State Level Broadband Committees have already been formed by the Government in the National Broadband Mission (NBM). The committees are composed of officials from the DoT HQ, DoT-LSAs, State Chief Secretary, Associations of TSPs & IP1s, and State (PWD/Urban development/Forest and Environment/IT) together. As the Government has already taken action to constitute these broadband committees across various LSAs, they are expected to cater to the need for a collaborative institutional mechanism between Centre, States and Local Bodies for addressing all RoW related Policy and execution issues. It can be argued that these collaborative institutional mechanisms are already in place and can serve the purpose for small cell and aerial fiber deployment using street furniture also. However, these committees need to include representatives from other government/public institutions that control street furniture such as airport authorities, port trusts, metro/railway authorities/Discoms/land owning agencies, etc.

**Q.14: Kindly suggest an enabling Framework that shall include suggestions about the role of various authorities, rules of coordination among them, compliance rules and responsibilities, approval process, levies of fees/penalties, access rules etc.**

## **BIF RESPONSE**

Response provided in Q13 above

**Q.15: How can sharing street furniture for small cell deployment be mandated or incentivized? What operational, regulatory, and licensing related issues are expected to be involved in sharing of small cells through various techniques in the Indian context and what are the suggested measures to deal with the same?**

## **BIF RESPONSE**

- A. 5G infrastructure demands huge densification of small cell sites. If each individual operator deploys their own equipment over the street furniture structure to differentiate on the depth and quality of coverage, it would lead to issues relating to power supply, permission, aesthetic and monetary aspects. To solve this concern, the existing 4G tower sharing practice by the operators in India can be adopted for street furniture usage as well to enable economies of scale and enhance affordability.
- B. The Government can consider expanding the scope of the IP-I category registration to include sharing of ready-to-lit infrastructure to non-licensed service providers who deploy small-scale architecture in these infrastructure elements. And to ensure sufficient power supply to the small cell sites, sharing of nearby power sources and generation units can be undertaken. Active infra sharing will expand the scope for small cell site sharing also resulting in faster roll out of the services across Pan India.
- C. Small cell deployment on street furniture, are based on in-house proprietary designs supporting only single operator deployment. Telecom equipment designs supporting multi-vendor deployments are generally used by infrastructure providers in India. Exploring deeper collaboration practices and bringing in regulations that permit or even oblige sharing agreements between mobile operators can help the Indian small cells deployment scenario.
- D. Sharing of small cells using the Multi-operator Radio Access Network (MO-RAN) architecture where only the base station equipment is shared while the core network is proprietary to each network provider, is a possibility. In MO-RAN, the cell coverage area is independent and have dedicated radio frequencies assigned to each mobile operator. This provides scope for each operator to control cell level, interference and decide their own optimization parameters. In MO-RAN, two or more operators operate on different spectrum, and this is the feature that differentiates MO-RAN from MO-CN (Multi operator Core Network) which is another popular RAN sharing approach, where the operator with frequency spectrum shares the allocated spectrum with other operators. If IP-I players are allowed to deploy active infrastructure owned by themselves, under a MORAN model, non-telco players (IP 1s) can allow TSPs to

