


<b>Regulation Cell,</b> Room no. 504, 5 <sup>th</sup> Floor, Bharat Sanchar Bhawan, Janpath, New Delhi – 110001 Tel. : 011 – 23734081-82 e-mail : agmregln@gmail.com	 <b>भारत संचार निगम लिमिटेड</b> (भारत सरकार का उपक्रम) <b>BHARAT SANCHAR NIGAM LIMITED</b> (A Govt. of India Enterprise)
---	--

**To**

Advisor (QoS)  
Telecom Regulatory Authority of India,  
Mahanagar Doorsanchar Bhawan,  
Jawahar Lal Nehru Marg, New Delhi-110002

**No:** BSNLCO-RGLN/25/3/2022-REGLN dated 29.06.2022

**Sub:** Comments of BSNL on Consultation Paper on "Rating of Buildings or Areas for Digital Connectivity".

Please find below para wise comments of BSNL on Consultation Paper on "Rating of Buildings or Areas for Digital Connectivity",

**Q.1.** How can an ecosystem be created to design, deploy and evaluate DCI with good connectivity in a cohesive and timely manner? What would be the typical role and responsibilities of actors of the ecosystem? Please justify your Comment with rationale and suitable examples, if any.

**BSNL Comments:**

The existing system of last mile access provided by the TSPs and IPs is capable to offer good connectivity in only in the open areas and sparsely distributed independent small storied buildings. In densely populated as well as multi-storied buildings, good wireless connectivity is still not provided satisfactorily to the end customers.

For new buildings, the property managers must be encouraged to provide earmarked place/ common infra like ducts to run cables, cable trays and power supply that can be easily offered to TSPs in a non-discriminatory manner. For existing buildings, the property managers must be encouraged to improve DCI inside building.

The entities, Property Manager, DCI Designers, DCI Engineers and DCI Evaluators as proposed in Para 4.2.1 of the Consultation Paper, once integrated in the present ecosystem can play a vital role in improving the digital connectivity in the buildings.

**Q.2.** How would the ecosystem proposed in Comment to Question no.1 ensure that created infrastructure does not get monopolized? Please justify your Comment with rationale and suitable examples, if any.

**BSNL Comment:**

1. The accessibility of infrastructure by the telecom licensee, required for providing the connectivity must be mandatory and protected under telecom laws and RoW rules.

2. The guidelines for DCI Designers should include the requirement of access by multiple telecom licensees at the design stage itself.
3. The capacity of on-board multiple licensees should be one of the prime criteria of evaluation of DCI Index

**Q 3.** How would the ecosystem proposed in Comment to Question no.1 enable DCI Designers to factor in the digital connectivity requirements of the existing and/or prospective users of the network? How can such requirements be gathered at the stage of construction of a new building or at the time of upgradation or expansion in case of pre-existing DCI? Please justify your Comment with rationale and suitable examples, if any.

**Q.4.** How would the ecosystem proposed in Comment to Question no.1 enable DCI Evaluators to get requisite information to evaluate and ensure that the designed or deployed network would meet the requirements of end users? Please justify your Comment with rationale and suitable examples, if any.

**BSNL Comment for Q3 and Q4.**

The DCI must be designed consideration the requirements of end users and taking into consideration of the requirements of TSPs. The requirements will be based on the estimate and the experience of similar buildings. With time the standard designs will start emerging, which will require only the customization for specific requirements.

DCI Designers will need to understand the requirements of TSPs and IPs and therefore a framework of interaction between DCI Designers and TSPs/IPs will have to be created.

**Q.5.** How would the ecosystem proposed in Comment to Question no.1 ensure that upgrades and expansion of the DCI are done from time to time and continue to meet rising demands? Please justify your Comment with rationale and suitable examples, if any.

**BSNL Comment**

The data provided by customer experience surveys and KPIs provided by the TSPs in periodical times will give information about upgrades and expansion of DCI. The platform of the interaction between Property Managers/Owners, DCI Designers and TSPs will be required for such continuous interaction.

**Q.6.** How would the ecosystem proposed in Comment to Question no.1 ensure that the TSPs' networks are planned, designed, deployed, and upgraded to serve the DCI requirements in a timely manner? Please justify your Comment with rationale and suitable examples, if any.

**BSNL Comment**

The improvement being observed in customer experience in buildings and improvement of quality of service will ensure that the network inside buildings are planned, designed, deployed, and upgraded to serve the DCI requirements by TSPs. Once accessibility of building is available, the competition between TSPs will ensure that they take initiative to provide better connectivity.

**Q.7.** How can an ecosystem be created to build capacity requirements of skilled professionals such as DCI Designers, DCI Engineers, DCI Evaluators? What

would be the typical role and responsibilities of actors of the ecosystem? Please justify your Comment with rationale and suitable examples, if any.

**Q.8.** How would the ecosystem proposed in Comment to Question no.7 ensure that relevant training courses are available in the country? Please justify your Comment with rationale and suitable examples, if any.

**BSNL Comments on Q7 and Q8.**

The skills required for the DCI professionals are be identified and incorporated in professional courses. These professional courses can be promoted under Skill India programme. The DCI careers must be made attractive to encourage new incumbents to enter into profession in taking consideration of future requirement of the industry.

**Q.9.** Whether the training courses proposed in Comment to Question no. 8 are already being offered by any organisation or institution that can be recognized for the purpose? If yes, please provide a list of organisations offering such courses. If not, how specialized courses can be designed to meet the requirements? Please justify your Comment with rationale and suitable examples, if any.

**Q.10.** Is there a need to establish a council on the lines of “Council of Architecture” (CoA) to regulate minimum qualifications, additional specialized courses and practice of DCI profession in the country? Please justify your Comment with rationale and suitable examples, if any.

**BSNL Comment on Q9 and Q10.**

There is need to create a professional body which can create specifically designed course curriculum and be authorised body to give certification.

In order to meet hectic task of infra development for upcoming technologies in telecom industry and the large responsibility on the professional to ensure good digital connectivity as per the requirements of end customers, a council on the lines of “Council of Architecture” (CoA) to regulate minimum qualifications, additional specialized courses and practice of DCI profession must be created.

**Q.11.** Whether the requirements of additional specialized courses and practices of profession would vary depending upon the size of work or kind of work involved in a particular DCI project? Please justify your Comment with rationale and suitable examples, if any.

**BSNL Comment**

There can be initially two levels of Course and Practices – Basic and Advanced. The first, basic course can cater to the requirement of creating infrastructure for ducting and cabling in a residential/commercial building. The Advanced Course should include the training on wireless networks coverage planning and in building solutions for wireless networks.

**Q.12.** Whether creation of a digital platform to hire services of professionals would help Property Managers in creation of DCI? Should there be a feedback mechanism to assess quality of services delivered by professionals? Please justify your Comment with rationale and suitable examples, if any.

**BSNL Comment**

The interested professionals who have undergone required specialized courses must be registered as consultants. A digital platform, enlisting all such professionals and firms who offer these services would definitely help property managers to readily seek these services from such professionals to develop good digital connectivity.

Such professionals and firms must be rated by property managers and TSPs/IPs and end customers to get feedback about the quality and performance of activity. This will help in hiring best performers to award work for prestigious property managers.

**Q.13.** Whether creation of a digital platform for procurement of certified products would help Property Managers in creation of DCI? How would the certified products for the purpose of DCI be identified and updated on the platform? Please justify your Comment with rationale and suitable examples, if any.

**BSNL Comment**

Needs of infra product that best suits the scenario is most important to readily develop DCI by property managers. The product manufacturing firms must be encouraged to prepare state of art and suitable products and get them to be certified by concerned authority. All such products available on digital platform will definitely improve the time required for searching products best suited for the building and may change the property manager's thoughts in alignment to develop good digital connectivity.

**Q.14.** What may be the possible models of DCI ownership and its upkeep? Whether co-ownership models would help in aligning incentives in realising connectivity that would meet expectations of the end users from time to time? Should there be a need to specify terms and conditions for entities owning and responsible for upkeep of DCI to function in a fair, transparent and non-discriminatory manner? Please justify your Comment with rationale and suitable examples, if any.

**BSNL Comment**

The property manager may himself register as Infra provider and manager DCI. The Property manager may be allowed to enter into agreement with TSP/IP to develop and manage DCI inside his property. It should be mandatory for DCI owner to provide connectivity access to all TSPs in a non-discriminatory manner.

**Q.15.** As one solution might not be suitable for all types of buildings, whether current requirements stipulated in the National Building Code of India, 2016 would be required to be evolved and prescribed ab initio to make it more appropriate for DCI requirements? Please justify your Comment with rationale and suitable examples, if any.

**BSNL Comment**

Yes. The NBC of India 2016 mentioned the ICT related requirements and specifications in installation of equipment, it did not take care of the design, plans and approvals.

**Q.16.** Whether NBC needs to prescribe a separate classification of buildings for the purpose of DCI? If yes, which factors should be considered to make such a

classification? If not, how to accommodate DCI specific requirements in the existing classification of buildings by the NBC? Please justify your Comment with rationale and suitable examples, if any.

**BSNL Comment**

Yes, NBC needs to prescribe a separate classification of buildings for the purpose of DCI.

The classification must be on the basis of

1. Type of construction of building,
2. Height of building
3. Area of Building
4. Materials used in the construction of building.
5. Type of partitions in the building
6. Usage of building
7. Population that accommodate inside building

**Q.17.** Whether there is a need to include DCI Professionals as Persons on Record as typically done in building bye laws or development regulations? Or registration with the Council proposed in Question no. 10 would suffice to practice profession across the country as followed in the case of Architects? Please justify your Comment with rationale and suitable examples, if any.

**BSNL Comment**

The registration of DCI professionals with the Council as proposed in Q.No. 10 should suffice. The process should be simple and easy to make the scheme attractive and draw large numbers in this field.

**Q.18.** How can the clearances or approvals required for DCI at various stages of construction of building may be incorporated in building bye laws? In typical building bye laws, there are provisions for getting clearances from central government e.g., in case of civil aviation, defense and telecom being a central subject, what role can be played by the central government in giving such clearances or granting such approvals? Please justify your Comment with rationale and suitable examples, if any.

**BSNL Comment**

DCI approval be introduced at

1. DCI design planning approval at Building layout approval stage before starting construction.
2. DCI completion certification after completion of construction during Building completion certification.
3. Leasing out of DCI to TSPs certification at service plan clearance stage after completion of construction.
4. DCI evaluation certification during occupancy certification stage.

**Q.19.** Is there a need to introduce a special class of Infrastructure Providers to create, operate and maintain DCI for a building or cluster of buildings in ownership models suggested in Comment to Question No. 14? What should be the terms and conditions for such special Infrastructure Providers? Should such terms and conditions vary depending upon type, size and usage of buildings? Please justify your Comment with rationale and suitable examples, if any.

**BSNL Comment**

As there will be large number of Property Managers/Owners, there should requirement of a very simple registration for any property manager to act as IP for the property owned by it. The terms and conditions should ensure that the infra must be shared by all interested TSPs without any discrimination and the infra must be upgraded/expanded as and when required for expansion or up gradation by TSPs.

**Q.20.** What are the initiatives or practices being taken in other jurisdictions outside India with regard to rating of buildings from a DCI perspective? Please share details and suggest how similar processes can be created in India?

**BSNL Comment**

No comments

**Q.21.** Is there a need to introduce Rating of buildings from the perspective of DCI that may help in nudging the Property Managers to strive for collaboration with other stakeholders to meet the digital connectivity expectations of the users of the building? Please justify your Comment with rationale and suitable examples, if any.

**BSNL Comment**

Yes. Whenever rating of buildings is introduced, it adds to or decrease the value to the property. The property managers will definitely be inclined to improve digital connectivity so as to meet the expectations of its customers. Property managers will collaborate with all the stakeholders to meet the expectations of end customers.

**Q.22.** In case, rating is introduced as a voluntary scheme, is there a need to monitor the progress? If progress is not satisfactory, would there be a need to launch campaigns and awareness drive to encourage Property Managers to come forward for rating? Please justify your Comment with rationale and suitable examples, if any.

**BSNL Comment**

For new constructions, the rating should be mandated at building completion stage and occupation stage.

But for the existing buildings, the rating should be initially voluntary as the ecosystem of DCI professionals will need time to get matured. This progress may be periodically monitored at all stages and awareness drive must be organized to encourage Property Managers to come forward for rating.

**Q.23.** Should the voluntary scheme of rating be extended to cover cities, towns and villages and even states? Would such a scheme help in encouraging local and state authorities to facilitate TSPs in creation or in improving outdoor as

well as indoor DCI? Please justify your Comment with rationale and suitable examples, if any.

**Q.24.** If in Comment to the Question No. 23 answer is yes then what framework should be introduced to rate cities, towns, villages and states, and how weightages can be assigned to different aspects of indoor and outdoor connectivity? Please justify your Comment with rationale and suitable examples, if any.

**BSNL Comment Q23 and Q24.**

As the DCI rating of property buildings will definitely add value to the property. In the same way the rating system must be extended to cover cities, towns and villages and even states. DCI rating system and incentivisation of the same by local governments for good ratings will definitely improve QOS of digital connectivity.

**Q.25.** Is there a need to make rating a mandatory requirement for specific classes of buildings such as public transport hubs, government buildings or any building of public importance etc.? If yes, which type of buildings should be covered under this category? Please justify your Comment with rationale and suitable examples, if any.

**BSNL Comment**

Yes the rating must be mandated for all important public buildings after evaluating the readiness of the ecosystem of DCI professionals.

All public high-rise buildings, densely populated buildings, High dignitaries and political VIP persons offices and buildings, Buildings where population movement is high, airports, ports, railway stations, public transport stations, bus stands, major rail routes and highways, large shopping complexes, industrial estates, major market areas, office or workplaces, government buildings, government residential colonies and any other building of public importance must be progressively covered under rating mandated category.

**Q.26.** What should be the time plan to rate buildings falling under the mandatory category and is there a need to prioritize some buildings within the mandatory category to make it more effective? Whether existing buildings falling under such classes are required to be dealt differently? Please justify your Comment with rationale and suitable examples, if any.

**BSNL Comment**

The action plan should be prepared as per the category of the building. The building being accessed by the public and with large number of occupants should be given priority.

The timelines and the readiness of the ecosystem of the rating needs to be synchronised. It will be too early to comment on specific timelines as on date. It should be periodically reviewed.

**Q.27.** Is there a need to designate a nodal official for building(s) falling under the mandatory category to comply with the rating related requirements? What actions are proposed to be taken in case of non-compliance? Please justify your Comment with rationale and suitable examples, if any.

### **BSNL Comment**

Yes

A nodal agency must be designated to accelerate rating mechanism for rating the buildings falling under the mandatory category and also to improve digital connectivity and complying with the rating related requirements.

At first attempt, if the rating is not compliant to above category building, the nodal agency must analyze and suggest the building authority, the steps taken to improve the quality of digital connectivity inside building. The re-rating must be scheduled within a timeframe.

**Q.28.** Is there a need to amend legal provisions under various laws, bye laws dealing with development of land and buildings or areas including forest areas, cantonment areas, port areas, panchayat areas, municipal areas etc. to facilitate creation of DCI and ratings of the buildings or areas? Please justify your Comment with rationale and suitable examples, if any.

### **BSNL Comment**

Yes. The provision of the DCI rating will have to be incorporated in the laws dealing with development of land and buildings.

**Q.29.** In case a voluntary scheme for rating is to be introduced or rating is notified as mandatory for specific classes of buildings then what should be the role of TRAI or DoT? Please justify your Comment with rationale and suitable examples, if any.

### **BSNL Comment**

The role of TRAI is to recommend the design of the complete ecosystem to ensure that building DCI rating system is implemented by all stake holders. TRAI must periodical monitor the progress of DCI rating of buildings. The progress will have to be continuously monitored.

DOT will have to implement the recommendations and create the framework for enabling the ecosystem of DCI professionals.

**Q.30.** Whether creation of "Regulatory Sandbox" to carry out experiments or demonstrate capabilities of innovative solutions to improve digital connectivity would be helpful to make changes in existing policies, laws or regulations? What should be the terms and conditions to establish a regulatory sandbox? Please justify your Comment with rationale and suitable examples, if any.

### **BSNL Comment**

No comments

**Q.31.** Is there a need to establish a Certificate Issuing Authority to award ratings to buildings from DCI perspective? If yes, what should be the structure of such an authority? If not, who can be assigned the role to perform this function? Please justify your Comment with rationale and suitable examples, if any.

### **BSNL Comment**

As submitted in response to Q9 and Q10, there is need to create a professional body with the responsibility to nurture skill for DCI Professionals. The same



professional body discharge the responsibility of being Certificate Issuing authority to award DCI rating of the building.

**Q.32.** Whether the authority suggested in Comment to Question no. 31 may use reports from DCI evaluators to award ratings? To ensure reliability of reports from DCI Evaluators, should Certificate Issuing Authority need to conduct periodic audits of DCI evaluators? Please justify your Comment with rationale and suitable examples, if any.

**Q.33.** What should be the terms and conditions for using ratings awarded to a building(s) from a DCI perspective? What should be the validity period of awarded ratings? Do you envisage any situations under which an awardee of ratings might be required to get the ratings renewed before the validity period? Please justify your Comment with rationale and suitable examples, if any.

**Q.34.** Whether in the initial stages of introduction of the rating system, validity should be for a shorter time period, and later it may be increased as evaluation system matures? Should the validity period be dependent on the type of buildings? Please justify your Comment with rationale and suitable examples, if any.

As expertise of rating system not evolved higher standards at earlier stages validity of ratings must be for shorter periods. The property managers must be given suggestions to improve its DCI ratings and later validity period may be increased.

#### **BSNL Comment Q32, Q33 and Q34.**

Yes, the reports from DCI evaluators can be used to award ratings. The certificate issuing authority must issue guidelines and SOP for the evaluators. The evaluation criteria must be well defined and transparently available.

It should conduct sample periodic audits of DCI evaluators through a team of auditors to ensure reliability of reports submitted by DCI Evaluators and ensure implementation of standard procedures and evaluation criteria. The rating may be redone in case of adverse finding by the auditor or in case of issues raised by TSPs or the end customers.

The validity of the rating is proposed to be initially two years for a new building and once its occupancy is stable, it can be increased to a longer period of three to five years. However the rating of public places like airports, railway stations, metro systems that attract crowd should be reviewed with more frequency, may be every two years.

**Q.35.** Whether the process of renewal of rating should be the same as the process defined to get rated first time or it may be incremental? Or renewal process may be dependent upon the grounds on which it is being renewed e.g. expiry of validity period, introduction of new technology, introduction of new spectrum band(s), introduction of new services(s) etc.? Please justify your Comment with rationale and suitable examples, if any.

#### **BSNL Comment**

The evaluation criteria, guidelines and SOP must be reviewed periodically (preferably yearly) based on the introduction of technologies and the requirement

of telecom service providers. The revaluation should be done on the basis of the extant evaluation criteria and not on the basis of the first evaluation.

**Q.36.** Whether the provisions to make an appeal should be introduced to give an opportunity to the applicant to make representation against the decisions of the Certificate Issuing Authority? What should be the time frame for preferring the appeal in case of disagreement with the rating assigned and its disposal? Please justify your Comment with rationale and suitable examples, if any.

**BSNL Comment**

Yes, the provisions to make an appeal should be introduced to give an opportunity to the applicant to make representation against the decisions of the Certificate Issuing Authority. There may be instances of disagreement of the Property Manager with the rating assigned to his building based on the measurement and the evaluation done.

The property manager must apply his appeal against the decision of certificate issuing authority within a predefined time period (may be 02 months) of receiving the communication of rating. The appeal so preferred is also required to be disposed within 3 months for maintaining fairness and transparency in the system.

**Q.37.** If somebody is found to be using ratings in an unauthorized manner, what legal actions are proposed to be taken against such entities? Please justify your Comment with rationale and suitable examples, if any.

**BSNL Comment**

The legal provisions, already available in Consumer Protection Act, 2019 (Section 2(18), Section 21 and Section 89) can be used for taking action against use of false rating by any entity.

Moreover the ratings should be publically available through some digital platform, so that the same can be cross checked.

**Q.38.** Whether creation of a digital platform that allows stakeholders to co-design and co-create DCI would be helpful to realize better, faster and cheaper solutions? Whether technologies and tools such as AI, ML would be helpful in achieving this objective? Please justify your Comment with rationale and suitable examples, if any.

**BSNL Comment**

Yes. Such a digital platform will be very useful and it should be explored.

**Q.39.** What should be the typical process to rate a building? Whether terminologies and steps involved in the rating process need to be standardized? Please justify your Comment with rationale and suitable examples, if any.

**BSNL Comment**

All the observations must be processed by giving predefined weightage to each parameter, digital connectivity rating can be derived using suitable algorithm.

Terminologies and steps involved in the rating process must be standardized which can be easily understandable by the stakeholders.

**Q.40.** Whether the process of rating would vary based on the types of buildings? If yes, then what factors or aspects of a building would matter or impact the outcome of rating? Please justify your Comment with rationale and suitable examples, if any.

**BSNL Comment**

The process of rating may be uniform. However, the evaluating criteria should match with the communication needs, which will depend on the type of the building.

**Q.41.** Which objective methods should be used to evaluate the DCI? How can various aspects of performance to evaluate the quality can be combined together? Please justify your Comment with rationale and suitable examples, if any.

**BSNL Comment**

The process to evaluate the DCI rating should be as follows:

1. Assessment of the communication needs of the occupants of the building
2. Assessment of telecom equipment installation in the building
3. Assessing the feasibility and capacity of DCI to facilitate the assessed telecom equipment
4. Evaluation based on the above

**Q.42.** Which subjective methods should be used to evaluate perceived quality of DCI? Whether survey techniques can be improved considering penetration of smartphones? Whether improved techniques can help in providing insights and actionable items to improve DCI? Please justify your Comment with rationale and suitable examples, if any.

**BSNL Comment**

The customer experience may be surveyed at door steps and using crowd source apps. Online surveys can be conducted.

**Q.43.** Would combining the parametric values or results of objective and subjective methods be helpful in assessing digital connectivity that is closer to the perceived quality of experience? Please justify your Comment with rationale and suitable examples, if any.

**BSNL Comment**

In objective type of collection of data even all parameters are above benchmark, different customers express different type of experiences regarding digital connectivity. Hence the parameters collected in subjective method by directly surveying and interacting with customers can give clear picture on the weightages that can be kept for different KPIs captured in objective field measurements. By combining the parametric values or results of objective and subjective methods, the assessment of digital connectivity will be closer to the perceived quality of experience.

**Q.44.** How advanced technologies such as Artificial Intelligence (AI), Machine Learning (ML) etc. might be useful to make the evaluation process more nuanced

and suitable for the purpose? How can AI/ML models evolve from the inputs of measurement and evaluation being carried out in other parts of the city, state or Country? Please justify your Comment with rationale and suitable examples, if any.

**BSNL Comment**

AI/ML may help in combining information from multiple sources such as network reports, field measurement reports, crowd source apps, prediction tools, survey reports etc. Creating picture of quality inside building after considering multiple sources and both objective as well as subjective assessments, may be much more reliable and closer to the perceived quality. However, process of combining of data may be context specific and there may be large number of variants, each one developed or evolved suiting to the context in which it is to be applied. Classification of buildings from digital connectivity perspective would help in this process. Digital tools, AI/ML may help in dealing with such large number of variants. Digital platforms created for this specific purpose may help in learning of this model from the data collected from different parts of city or state or country.

**Q.45.** Any other issue which is relevant to this subject? Please justify your Comment with rationale and suitable examples, if any.

**BSNL Comment**

Nil

Regards



Ved Prakash Verma  
DGM (Regulation-II)  
BSNL CO. New Delhi