ISPAI response to TRAI Consultation paper on 'Rating of buildings or Areas for Digital Connectivity'

Preamble:

At the outset, we thank TRAI for bringing in an innovative, path breaking and transformational concept of introduction of ratings of buildings or areas for digital connectivity supported by a legal framework with respect to Digital Connectivity infrastructure" through this consultation paper. TRAI vide this paper has suggested a roadmap for creating an enabling environment for the creation of an ecosystem in designing, implementing, operating, maintaining, expanding connectivity through up-gradations to meet future challenges of digital connectivity inside buildings and areas.

We believe that this is an important area which requires attention as there is a need to enhance connectivity in the buildings and facilitate roll-out of networks by making it easier for TSPs and ISPs to have access to buildings and adjacent areas for laying of network.

Further, we submit that it is equally important to consider that this concept of DCI is being discussed in India for the first time, and, given the potential vastness of its scope with inter-sectoral interactions (real estate being other sector), there should be thorough deliberations to propose / recommend a workable framework, that promotes DCI in a non-discriminatory manner, and does not become an additional burden on the Telecom ecosystem players.
Due to the ongoing COVID-19 pandemic, reliance on digital connectivity has been increased exponentially. Indian populace is majorly dependent upon the mobile networks to stay connected and for online activities such as shopping, education, health care, or work from home etc. While there have been significant improvements in coverage of telecom services on the street however despite of various efforts, there are still huge gaps in meeting the quality demands of the users inside and across the buildings/ residential or commercial areas.

The foundation of the current consultation process lies in the monograph document – Quest for a Good quality framework" published by TRAI in September 2020 and through this consultation process, TRAI has proposed a mechanism to the quality concerns brought forward; through a draft framework for building an eco-system to address the Quality-of-Service concerns regarding wireless telecom services being faced inside the buildings. To combat the ongoing Covid-19 pandemic, QoS becomes more critical considering the fact that the concept of Work from Home or the hybrid concept of WFH and Work from office has become a new normal for working population in the country.

We are of the view that the collaborative approach suggested in the paper among all relevant stakeholders including the involvement of end-users in decision making processes at an early stage, in co-designing and co-creation of the digital connectivity infrastructure inside the building/society or area, is a right step in this direction. It would provide our member ISPs an 'Ease of Access' if the property owner/manager of properties which are in the category of Enterprise workplace (e.g. co-space), shopping malls, industrial states, restaurants, cafes etc. or of the residential societies (high rise buildings) will create the necessary Digital Infrastructure (e.g. duct space) which any ISP, be as enterprise service providers or retail ISPs who can utilize such infrastructure to smoothly provide network connectivity to their Customers.

The legal framework containing provisions specified in various laws and guidelines for the development of telecom infrastructure in an area/building and suggests measures to include digital connectivity infrastructure as an essential component for the completion of a building and/or development of an area, should be recommended by TRAI as an integrated part of the overall policy document on this important subject. This will also reduce the work on part of TSPs/ISPs who otherwise take the complete responsibility of building the digital infrastructure

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(which includes, creating duct space for fiber, renting space to put equipment, ROW etc.). Users of these buildings will also have the ease of obtaining services without any feasibility or approach problem. This will save time and RoW issues for TSPs/ISPs while catering to the requirement of its customers. TRAI in the paper has also proposed a value addition to the buildings or areas by introducing digital connectivity infrastructure evaluations and award ratings in terms of points or stars, based on the quality of experience assessed in a scientific way involving a combination of field measurements, users' experience of digital connectivity provided in their buildings or premises. The paper also describes various methodologies for measurement of quality parameters which include consumption profile, building profile, for the rating of buildings or areas for digital connectivity.

We believe that the suggested steps in this consultation paper will play a vital role in creating and strengthening overall ecosystem around identifying buildings / areas as part of digital infrastructure for connectivity purposes and will be a win-win for all stakeholders.

Our issue wise response to this paper is as follows:

Issue wise response:

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 response with rationale and suitable examples, if any.

ISPAI Response:

TRAI in the consultation paper has recommended a 4- pronged eco system to create, design, deploy a Digital Connectivity infrastructure (DCI) through

1. Property Manager- who will own the Digital Connectivity infrastructure and maintain/ augment the same themselves or through third party agency
2. DCI designers- Certified professionals to design networks for inbuilding solutions
3. DCI engineers - Certified professionals who will implement the designed solutions
4. DCI evaluators – Empanelled agencies to measure and evaluate quality of network inside buildings

We support the ecosystem suggested by TRAI as above in the paper. However, in the current scenario, the TSPs/ISPs and IPs have already provided the in-building solutions in various buildings and are governed by long term contracts. There is a need to include these existing buildings / areas having digital connectivity infrastructure as well as a part of overall ecosystem.

Typical building infrastructure falls in various categories as listed below,

- Commercial & shopping complexes with muti or single tenant.
- Residential building & complexes with multi or single tenant.
- Combination of commercial & residential complexes.
- Public services infrastructure such as Railway Stations, Bus Stations, Cinema Halls, Sports stadiums, Marriage & Convention Centres, Art Galleries, etc
- Government & PSU Office complexes of State & Central Government

Each of these places have different requirements of digital connectivity and services. It is critical to create a process to collate such requirements from each of the user category which then can be used to formulate well defined standard categories (Model Building Bye Laws) & relevant guidelines for design of fundamental infrastructure to support such digital connectivity. These guidelines then can be implemented to upgrade the digital connectivity

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infrastructure in the existing buildings and also same to be adopted for any new construction in the specific category in a timebound manner.

These guidelines should be reviewed once in two years for any modifications and should be updated based on the collation of user requirements received during the period.

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

ISPAI response:

TRAI in this paper has suggested that new ecosystem would be identified and recognised under ROW rules, National Building code, Model building Bye laws, MOHUA/ Town and Planning guidelines etc. We suggest that legal framework should include the terms and condition under these rules/ bye laws to support a transparent, cost effective, neutral and nonexclusive approach to be adopted by property manager who will be owning the infrastructure. Such principles apply to IP-I entities and since TRAI has also suggested the registration of property managers as infrastructure providers, these principles should be made applicable to them as well which can avoid a monopolisation of digital connectivity infrastructure.

Q.3. How would the ecosystem proposed in response 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 response with rationale and suitable examples, if any.

ISPAI response:

As indicated in our response at Q1, all the building infrastructure to be categorised based on the end users of those properties and create model guidelines for upgrading the existing infrastructure as well as adopt these guidelines right at the time of new constructions. This will create uniform standardisation of building infrastructure across different categories and the same can then be referred for multiple applications.

Also, as suggested in the consultation paper, digital tools and platforms can play an important role. Collaboration among stakeholders including potential users can be achieved through digital platforms- which can help in gathering their telecom requirements at the time of construction of new building.

With the development of rating system, the real estate developers would themselves be keen to take into consideration the potential customers' requirement. They can contact the potential buyers in a project or who have booked their houses and seek their inputs for which they can come up with some incentivisation scheme as well.

In the pre-existing DCI, the process is relatively easier as the RWA / property manager can form a committee of informed residents to provide their inputs.

Q.4. How would the ecosystem proposed in response 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 response with rationale and suitable examples, if any.

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ISPAI response:

The evaluation by DCI evaluator can be either for a designed network or for a deployed network. In case of designed network, the evaluator can use simulation/ AI/ ML techniques to assess the network capability. While in case of deployed network, the process can be similar to the rating process proposed by the authority. In that case, it would depend upon subjective and objective parameters.

Q.5. How would the ecosystem proposed in response 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 response with rationale and suitable examples, if any.

ISPAI response:

We believe since the DCI would be owned by property manager, it will be in its own interest to consider upgrades and expansions so as to meet the digital connectivity requirements of its residents. As indicated in our response to Q1, Property Managers can adopt a process of collating user feedback and inputs on their digital connectivity needs through the period and submit the same for standardisation process and at the same time evaluate the need of enhancing existing digital connectivity infrastructure to meet the user requirements. Further, this aspect can be addressed through the legal framework which would support the new eco system being proposed herewith for ensuring non-discrimination while providing building / areas to TSPs /ISPs and IP-Is for building digital connectivity infrastructure.

Q.6. How would the ecosystem proposed in response 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 response with rationale and suitable examples, if any.

ISPAI response:

Once the standard guidelines for different building categories are formulated for DCI, the same can be mandated through building awareness within stakeholders and most importantly the property managers with definite timelines and seeking compliance.

We believe that the ecosystem proposed in the paper vide this consultation paper is self-sustaining as regarding the timely upgradation of the network is concerned. The residents would demand a quality / upgraded network all the time and thus there will be a pressure on property manager who in turn would seek the upgraded active telecom infrastructure from the telecom operator.

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 response with rationale and suitable examples, if any.

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

Q.9. Whether the training courses proposed in response 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

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specialized courses can be designed to meet the requirements? Please justify your response with rationale and suitable examples, if any.

ISPAI response to Q7, Q8 and Q9:

Organisations such as Telecom Sector Skill Council, Telecom Centre of Excellence, NTIPRIT, TEC etc. may be roped in to develop curriculum, standard training program for DCI designers. Engineers, and evaluators.

As rightly mentioned by the authority in the consultation paper, the current courses available (such as courses provided by BICSI, CTNS, iNARTE) would need to be studied regarding suitability of their content.

Apart from the above, the present training infrastructure available in the sector needs to be utilised. Digital platforms for hiring of certified professionals would need to be developed.

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 response with rationale and suitable examples, if any.

ISPAI response:

There is no need to establish a council on the lines of "Council of Architecture" (CoA) to regulate minimum qualifications, additional specialized courses etc. as there are various organization like TSSC and real estate skill councils who may jointly develop such certification and modules. However, the present framework may be modified/overseen by the sectoral regulators TRAI and RERA jointly.

Further, there should not be separate degree for DCI professionals. The DCI as a subject may be recommended to be a part of the existing degree courses

For the time being, it is suggested that the training institutes may get affiliated to NITs/ IITs/ and some reputed private engineering colleges under Electronics and Communications department– who may help in developing standardised courses and confer certification for designers/ engineers and evaluators.

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 response with rationale and suitable examples, if any.

ISPAI response:

While the size of a project does make the difference, we feel that additional specialised course may not be required. The standard courses should be able to take care of all types of scenarios. The designer/ engineers would be getting smaller projects in the beginning, but with gain in experience and expertise, they would be able to get large projects as well.

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 response with rationale and suitable examples, if any.

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We believe the creation of digital platforms to hire the services of professional who would contribute in creating Digital Connectivity infrastructure – is desirable, but should not be mandatory. The development of platform should be left to market forces. The feedback mechanism to assess the quality of services should also be established. The rating of any individual/ company/ organisation has become standard practice globally due to the reach of social media amongst masses.

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 response with rationale and suitable examples, if any.

ISPAI response:

The creation of certified products is much needed as it would maintain the quality & standardisation perspective. TRAI has envisaged that TEC is well equipped to handle the certification of products. We believe TEC can come up with a digital platform/ or through its own web portal and provide details regarding certified products which the property managers can use to create the DCI. Availability of certified products in the public domain will enable network designers to consider them when designing solutions and procuring such products. Hence this should be encouraged

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 response with rationale and suitable examples, if any.

ISPAI response:

We believe that by co-owner ship, TRAI is inferring that while passive infrastructure elements may be owned by the Property manager, the active infrastructure elements such as antenna, BTS etc are owned by Licensed TSPs/ISPs. In that context, in case an agency appointed by the property manager fails to upgrade its network for technology evolution / higher capacity requirement- the contract of the agency can be terminated in between. At present, the scenario is different since the ownership of passive infrastructure is with the IP-I or ISPs/TSPs. Therefore, while the co ownership model may be adopted for the newly constructed/ upcoming buildings, for the existing buildings, there would be challenges in adopting the suggested model.

We support the Authority's view that there is a need to specify terms and conditions for entities owning and responsible for upkeep of DCI in a transparent, fair and non-discriminatory manner. In case, the infrastructure provider agency /TSP/ISP offers some unfair or unreasonable terms to a new TSP/ISP other than incumbent TSP/ISP, the residents would unnecessarily suffer from poor quality of services. Any such unfair and unreasonable terms would also create non-level playing field against the new / other licensed TSPs/ISPs.

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 response with rationale and suitable examples, if any.

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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 response with rationale and suitable examples, if any.

ISPAI response to Q.15 & Q.16:

We support TRAI's view that current NBC, 2016 would need to be amended since at present there is no separate concept of preparation of plan and designs, approvals and certifications. Further, telecom and ICT requires a separate classification on the lines of classification of building for Fire and safety. The model building bye laws 2016 classify building on the basis of use of premises or activity, design or height, features and safety due to maintenance level. This list can be used as a reference and can be suitably adopted for classification of buildings for the purpose of Digital Connectivity Infrastructure.

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 response with rationale and suitable examples, if any.

ISPAI response:

We believe that registration with the council should be sufficient to all the designers, engineers and evaluators to practice profession across the country. The NBC may be amended to such effect.

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 response with rationale and suitable examples, if any.

ISPAI response:

There would be a need to amend the building bye laws so that the DCI approvals are incorporated during the construction stage of the buildings. This can be achieved by a careful mapping of current construction-based approvals with the establishment of DCI infrastructure. The design evaluator can certify the same or the DCI approvals on behalf of Department of Telecommunications, Government of India may be provided by LSA field units/or accredited engineering institutions like IIT/ NIT etc.

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 response 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 response with rationale and suitable examples, if any.

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No, there is no need to introduce special class of Infrastructure providers to create and maintain DCI. Property Manager should be responsible and to have complete ownership of the building.

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?

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 response with rationale and suitable examples, if any.

ISPAI Response to Q 20 & 21:

We support the creation of rating system for the buildings/ areas to be identified for Digital connectivity infrastructure. It will nudge the property manager to act proactively in order to create / augment/ upgrade the telecom infrastructure. It will support end users' interest as well. It may also impact the sale price of a building going forward. There are many positives' outcomes emerging out of this exercise.

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 response with rationale and suitable examples, if any.

ISPAI response:

The rating system can be optional in the beginning with a monitoring approach. If the progress is not satisfactory, the campaigns may be launched to popularise the concept. If this does not work, pilot projects may be launched in metro cities with the help of reputed real estate developers to develop a building with model DCI and thus show case the importance of good digital connectivity infrastructure. However, a timeline should be defined post which the rating system w.r.t. DCI should become a mandatory requirement.

The availability of the networks of all the TSPs operating in the area shall be one of the major criteria in the evaluation process of the DCI. The Property Manager should ensure that the building / area should have good quality of DCI for availability of network of all the TSPs who are present in that geographical location. This should be one of the most important criterion and should be taken into consideration while rating. However, in case there is a situation where any lesser number of TSPs are present due to any circumstances, the same needs to be factored while rating i.e. the Rating of a building where assessment of availability of network of all (or higher numbers of) TSPs should always be (incrementally) higher than the Rating of a building having lesser numbers of TSPs networks available. An additional point may be given in rating for each higher number of TSP network available in the building. The same will facilitate curbing of the TSPs' monopoly to install infrastructure through exclusive contracts with the owners/builders. Also, this criteria will include all the subscribers irrespective of their TSP, ruling out any bias/disadvantage to them.

Also, the ratings shall be made available on the digital platform on the basis of scientific calculations done by the DCI Evaluator, based on the norms and principles laid out. A good awareness campaign will push property managers of existing buildings to get their buildings rated.

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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 response with rationale and suitable examples, if any.

ISPAI response:

It will be very helpful in encouraging healthy competition between cities/ States in case the concept can be broadened. IT companies are likely to take a serious note of such ratings and expand in the well-connected cities/ towns. It will also help in attracting FDI to the States who are well aware about the benefits of digital connectivity and take a lead in establishing good telecom infrastructure.

Q.24. If in response 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 response with rationale and suitable examples, if any.

ISPAI response:

We submit that if concept of rating of building is extended to rate cities, towns and even villages, then it may push local government authorities to mobilize local resources to create awareness about rating. The local authorities and states may also take steps to improve rating of their cities, towns, villages which may include facilitating RoW for TSPs to enable expansion of network.

However, with regard to rating of towns, villages, and states, we submit that a phase wise approach should be adopted. In the first phase the rating of the buildings should be done. Once this process of rating of buildings is tested and established, then in the second phase, the ratings of towns, villages, and states may be carried out.

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 response with rationale and suitable examples, if any.

ISPAI response:

While the buildings which are privately owned by residents may go for building rating on their own, there is a need to make the rating mandatory where the ownership of end users is not there, or they have not rented any space there. A mandatory rating system may be introduced in such type of buildings falling under public places like Airports, railway stations, ports, large bus stands like Inter State Bus Terminus, large shopping complexes, malls, government buildings, courts, hospitals, and any other building of public importance should be covered under mandatory rating.

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 response with rationale and suitable examples, if any.

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The rating of buildings under mandatory category should be completed within 24 months post the development of legal framework and rating system. Buildings of public importance such as Airports, railway stations of metro cities, hospitals etc. which see a large footfall- can be prioritised and may be covered within 18-24 months of development of legal framework / rating system.

We also suggest that as a starting point a "Connectivity index" would be a good parameter for DCI and mandating connectivity index would force the Property Managers to put efforts to make their property ready for telecom infra and take away any bias towards any TSP/ISP. As an illustrative list a connectivity Index inter-alia may include the following parameters:

Parameters	Available	Provision
Connectivity		
Fiber to Premise		
Fiber to Towers		
Fiber to Home		
Fiber to Rooms		
Wireline Ethernet within rooms		
Meet me IT / Telecom room or facility		
Provision for macro sites		
Provision for site on street furniture		
WiFi within premise		
Provision for video cameras within premise		
Power backup for DCI infra		
Digital map of the premise		
Neutrality towards TSPs		
- Fiber to premise		
- Macro site		
- Small cells on street infra		
- Fiber to home		
Open Wifi within the campus		

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Ownership of maintenance of DCI		
Commercial cost for TSPs		
- Rental for Macro sites		
- Rental for Small cells		
- Cost for laying fiber within premise		
- Cost for laying fiber to each home / apartment		

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 noncompliance? Please justify your response with rationale and suitable examples, if any.

ISPAI response:

Appointment of nodal officer for the rating exercise in the buildings falling under mandatory category would certainly be helpful for the coordination and faster execution at ground. Most of the buildings falling under this category would be Government owned buildings. Non appointment of nodal officer may be dealt as per extant Government rules related to this aspect.

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 response with rationale and suitable examples, if any.

ISPAI response:

We are in agreement with TRAI that there is a need to amend existing legal provisions 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 on account of following issues:

- To empower end users to influence the decision and force property managers to act in their interest.
- To support stakeholders in getting necessary permissions from concerned authorities within fixed timelines

The legal provisions would have to be incorporated in the relevant laws/ bye laws, Acts such as Forest Act, Railway Act, Cantonment land administration rules, National Building Code, Indian Telegraph Act, Indian Wireless Act, Buidling bye laws, Real Estate Acts, Regional Development Plan formulation and Guidelines etc. These laws/ guidelines/ rules will have to be reviewed periodically.

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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 response with rationale and suitable examples, if any.

ISPAI response:

Role of relevant Authority becomes critical in providing legal backing for development of DCI for buildings and subsequent rating of the DCI. DoT/ TRAI to play an active role in coordination with RERA/MoUHD in getting the changes in the laws/ guidelines.

The role of TRAI and DoT would be multi-pronged and very crucial to institutionalise building rating system as well as to create and strengthen new ecosystem as it would require action at multiple levels. Under the Gati Shakti program, a forum of cross sector regulators has been created which can be utilised to make the proposed new ecosystem operational.
Following steps would be needed from the Regulator:

- A wider consultation would be needed on various aspects such as legal framework, modifications/ additions required to the current legal and administrative framework, accreditation of Designers, engineers and evaluators, development of rating methodology etc.
- Review / monitoring of the ecosystem including rating system from time to time depending upon evolution of wireless technology
- The most important aspect would be to create a mechanism to implement the new ecosystem.

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 response with rationale and suitable examples, if any.

ISPAI response:

The new ecosystem would require to be demonstrated so that the relevant stakeholders could understand the importance of bringing in / developing the new ecosystem to ensure creation of digital connectivity infrastructure in a time bound and non-discrimination manner. It would also act as platform where the designers/ engineers/ reviewers can show case their products for their potential customers i.e. the property managers.

We feel that TRAI / DoT/ MOHUA may develop some pilot projects in this regard – one each in metro city with the help of real estate developers in order to get the wider acceptance.

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 response with rationale and suitable examples, if any.

Q.32. Whether the authority suggested in response to Question no. 31may 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 response with rationale and suitable examples, if any.

ISPAI response to Q.31 & Q.32:

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For DCI rating and certification, a committee empowered to issue certificate may be formed under Department of Telecommunication ('DoT') and TRAI. Such empowered committee should be assigned the responsibility of developing the norms and guiding principles.

We suggest such committee should be a multi stakeholder one with varied representation from prominent stakeholders in the DCI ecosystem, viz. Government departments, TSPs, builder representation, DCI Designing experts, DCI Engineering and Evaluation experts, among others.

We submit that DCI Evaluators will be ideally suited for providing feedback reports to the rating certificate issuing authority. However, DCI Evaluator's report alone may not be adequate and site-specific survey by the authority may be necessary especially where building developers or PMs Property Managers are able to influence the decisions of the DCI Evaluators. Based on DCI Evaluator Assessment, the committee led by DoT and TRAI should issue rating certificate. It is pertinent to mention that no separate approval should be required from DoT and TRAI or any other body for issuing a rating certificate.

The certificate issuing committee should be free to make use of reports from DCI evaluators and may carry out random subject assessment as well. Further, the DCI evaluators would also need to be subjected to periodical audits to ensure the authenticity of reports published by them.

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 response 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 response with rationale and suitable examples, if any

ISPAI response to Q.33 & Q. 34:

The ratings awarded to the building may be allowed to be used by property manager in promoting / marketing the building. In case of scenarios such as wireless technology evolution- the rating should be renewed.

We also agree that the validity of the rating given to the building should be for a shorter time period in the beginning, so that sufficient time can be given for the ecosystem to develop as well as maturing of evaluation system. The validity period of the rating should be as per the building usage and type of building.

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 response with rationale and suitable examples, if any.

ISPAI response:

The process of renewal should remain same for rating a building whether it is for first time or second time. There may be new obstacles to the radio waves propagation inside the building

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due to change in layout etc. and hence the renewal process needs to be similar. Further, it is felt that in case of technology evolution, the rating process should be reviewed, and building should be rated in terms of revised process.

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 response with rationale and suitable examples, if any.

ISPAI response:

There is no need for appellate mechanism as the Property Manager itself is hiring the DCI Evaluator and the certificate is issued on the basis of rating provided by DCI Evaluator. If required, the Property Manager can be provided some limited opportunities to request for re-evaluation through a different DCI Evaluator. Furthermore, the property manager may be allowed to represent to DoT and TRAI committee in case necessary to approach higher level.

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 response with rationale and suitable examples, if any.

ISPAI response:

Using of ratings in an unauthorized manner should be treated at par with fraud.

The Regulatory Authority may incorporate penal provisions in the Regulations/policies which can be monetary in nature or other actions could also be considered like blacklisting the developer. This would discourage the property managers from any such malpractices.

Further, to avoid misuse or use of rating in unauthorized manner, we suggest rating assigned to buildings may be published on the online portal as mentioned in comments to Q.38

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

ISPAI response:

Technology advancement is going to assist the co-design and co-creation of Digital Connectivity Infrastructure. The latest software tools / platforms as highlighted by TRAI in the consultation paper would be very useful:

- 3D and 4D designs,
- Building Information Modelling (BIM) software,
- Construction Operations Building Information Exchange (COBIE),
- Use of Augmented Reality,
- Digital twin,
- use of advanced Unmanned Aerial vehicle to predict radio propagation

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Building a digital connectivity infrastructure requires collaborative partnerships, co-designing and co-creation being some of the broad elements of such partnerships. All relevant stakeholders should be involved in co-designing and co-creating DCI inside the buildings if the varied needs of various consumers are to be fulfilled in a satisfactory manner. Hence creation of a digital platform that allows stakeholders to co-design and co-create DCI will be helpful. A digital platform may be jointly developed by TRAI and RERA with due consultation with TSPs.

With the advancements in digital tools and availability of advanced techniques such as Artificial Intelligence (AI) and Machine Learning (ML), rating can be achieved in a more reliable and authentic manner.

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 response with rationale and suitable examples, if any.

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 response with rationale and suitable examples, if any.

ISPAI response to Q.39 to Q.40:

We are of the view that both subject and objective methods should be used to determine the network quality and QOE of such mobile networks in a building or area considered for the purpose of rating. We agree with the views expressed by TRAI in para 7.2.5 that detailed understanding of the building structure, layouts and properties of material from which it is made is necessary to be factored in using advance tools. Digital tools based on AI/ML should be explored in combining the information received from subjective and objective methods along with the type of building, experience of service quality while using various services e.g. voice, data, streaming, M2M etc.

We also agree with TRAI's observation that in order to define a particular rating methodology there would a requirement to first define the various terms which would be the elements of any assessment process. For example, a building situated in a densely populated area of Delhi cannot have the same assessment methods w.r.t. a building used for warehousing purpose at outskirt of Delhi. Considering the same, there should be a terminology which represents areas with similar characteristic to rate various buildings. Hence, areas such as high-rise society, warehouse, public transport places (bus stand, airport, railway stations), University campuses, hospitals etc. need to be considered so that the area under rating should have similar characteristics and context.

As suggested in our comments to question no.26, we would like to reiterate that "Connectivity Index" may be considered for the purpose of rating a building or premise, there are certain parameters which may be considered for creating a "Connectivity Index" for any residential or commercial complex.

This index would be derived from points in each of the proposed parameters (tabulated below). Based on the same end user would be in a position to take better call on whether the premise/building is suitable for telecom connectivity/digital connectivity experience or not.

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Parameters	Available	Provision
Connectivity		
Fiber to Premise		
Fiber to Towers		
Fiber to Home		
Fiber to Rooms		
Wireline Ethernet within rooms		
Meet me IT / Telecom room or facility		
Provision for macro sites		
Provision for site on street furniture		
WiFi within premise		
Provision for video cameras within premise		
Power backup for DCI infra		
Digital map of the premise		
Neutrality towards TSPs		
- Fiber to premise		
- Macro site		
- Small cells on street infra		
- Fiber to home		
Open Wifi within the campus		
Ownership of maintenance of DCI		
Commercial cost for TSPs		
- Rental for Macro sites		
- Rental for Small cells		
- Cost for laying fiber within premise		
- Cost for laying fiber to each home / apartment		

We are of the opinion that terminologies and steps involved in the rating process need to be standardized and not left to individual perception to bring objectivity in the rating process.

Hence, we are of the view that considering the vast differentiation in the type of area and/or buildings which to be rated, it would be very difficult to put standard terminologies which then can be used to rate a particular building. It would be better to define the steps involved in the rating and criteria being used. Also, both objective and subjective methods should be factored in along with area/building characteristics for the purpose of rating.

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 response with rationale and suitable examples, if any.

ISPAI response:

We are of the view that various objective methods as outlined in the consultation paper should be used and the outcome should be the combined value arrived from these methods to evaluate the DCI. One single method cannot be the evaluation criteria as it can be affected due to different aspects occurred at the time of evaluation. For example, network performance monitoring report which provides the overall network performance in a month or quarter may

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get impacted due to occurrence of heavy rains, flood, cyclone in that particular area/circle. Similarly, the drive test or field measurement may get impacted if any festive or large gathering or heavy traffic observed in the route of drive test on a particular day. Hence, using different methods and combining them together to arrive at the single value to evaluate DCI will subdue the variables which may impact different single methodologies.

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 response with rationale and suitable examples, if any.

ISPAI response:

We are of the view that the subjective evaluation should be done through online survey or portal and thereafter the same should be combined with the values generated from objective methods to arrive at overall evaluation of the quality of DCI. Subjective methods, while creating an opportunity to understand the perceived quality or quality a customer actually experience, has its own flaws as it depends on person to person and their situation at that moment which such customer is filling the survey form.

Penetration of smartphone can also help in conduct of these surveys as the reach of the surveys could be maximized by doing these online. A larger coverage could be achieved which could provide better insights.

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 response with rationale and suitable examples, if any.

ISPAI response:

It appears this assessment may be helpful, however, given this concept has been discussed for the first time in India, therefore, it is too early to give a definitive answer /example in this regard. Furthermore, for overall assessment of quality, information obtained via objective methods needs to be compared with information provided via subjective methods. In fact, subjective methods may help in determining weightages applied in case of objective methods. For example, a survey might help better understand the needs of residents in apartment block. For rating purposes, information obtained via both methods may be required to be combined.

Therefore, as stated in response to Q. 42, combining the results of objective and subjective methods are necessary in assessing the digital connectivity. While objective methods may provide more technical outcome or performance of a DCI, the subjective methods offer the real experience a user has of such DCI. Both are equally important, and both have their own limitations due to which using one method to arrive at a value which is closer to real perceived QoE may be unfair to the operator as well as the user. Considering the same, and to overcome various limitations of these two methods, it is advisable to combine the valuation of both the methodology to have a fair picture or valuation of the DCI.

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 response with rationale and suitable examples, if any.

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ISPAI response:

Since, this concept of rating of building/DCI is new in India, therefore, we believe that the parameters suggested in Response to Q39, will help building a base for evaluation and rating purposes. Once the same is established over next few years, the advanced Techonlogies such as AI/ML may be looked at integrating better outcomes.

AI/ML based digital tools can not only help in collecting the survey data while engaging the user/participant in more effective way thereby encouraging participation in such survey which would also result in large sample size. Further, AI/ML based tools would be helpful in combining the data points arrived through various methodologies of objective assessment and combining them with the survey/subjective assessment. AI/ML can also help in dealing various variants and in identification of extreme factors in both sides of evaluation which can also be removed to ensure the valuation are closer to each other so that the realistic evaluation of QOE of DCI can be calculated.

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

ISPAI response:

We would like to emphasize here that DCI and its performance can be significantly impacted due to illegal/unauthorized boosters and repeaters, thereby deteriorating Quality of Experience and Service for the user, and network.

In this case we submit that illegal installation of boosters/ repeaters should be made a cognizable offence on an immediate basis. Also, targeted action needs to be taken to ensure removal of such existing installations of boosters/ repeaters. In this regard, we recommend that various enforcement Authorities like WPC/ DoT and Police and impacted operators individually or through industry associations form a special task force and they be empowered to take necessary action for survey/ removal of such installations and such reports be shared/ published on a monthly basis by the DoT and TRAI.

Also, for DCI to be truly successful, implementation of access rights (RoW) within building premises are fundamental for TSPs to deploy networks. Hence RoW within building premises should be provided free of cost, and mandatorily.

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