Inputs on TRAI's Consultation paper on 'Regulation on Rating Framework for Digital Connectivity in Buildings or Areas'

Centre for Digital Economy Policy Research (C-DEP) response to:

Q4. With reference to the rating criteria proposed in table at Section 6.2, kindly provide a list of possible sub-criteria and corresponding sub-weightage against each criterion with justification? Please also indicate any other aspect which needs to be included or modified in the proposed weightage criteria. Please provide your answer with suitable justifications.

A4. The demand for evaluating buildings in terms of Digital Connectivity Infrastructure (DCI) has emerged due to the increasing importance of dependable and efficient digital connectivity within structures. Ratings play a crucial role in evaluating and conveying the quality of DCI services in buildings, guaranteeing that users and occupants enjoy access to top-notch connectivity. The process of implementing ratings for DCI in buildings requires collaboration among different agencies and stakeholders. This collaboration aims to set standards, evaluate compliance, and offer guidance to ensure the provision of effective connectivity.

We need ratings for Digital Connectivity Infrastructure for the following reasons:

a. **User-Centric Focus:** Ratings play a pivotal role in prioritising the user experience, ensuring that occupants in a building have access to seamless digital connectivity—an imperative for work, communication, and daily activities. By empowering users with the information needed to choose buildings wisely, ratings stimulate demand for superior connectivity.
b. **Transparency and Choices:** Ratings offer transparency regarding the quality of Digital Connectivity Infrastructure (DCI) in a building, enabling users to make informed decisions when selecting a place to work or live.
c. **Stimulating Competition and Innovation:** Ratings act as catalysts, motivating building owners and developers to invest in robust DCI infrastructure. This fosters healthy competition among buildings to provide superior connectivity and innovative services.
d. **Establishing Quality Benchmarks:** Ratings set a benchmark for DCI standards, promoting adherence to best practices and driving continuous quality improvement across buildings.
e. **Enhancing User Experience:** To gauge the quality of experience for users, rating parameters should be collected through subjective methods, such as direct surveys and interactions with customers. This approach provides a clear understanding of the weightages that can be assigned to various Key Performance Indicators (KPIs) captured in objective field measurements.
f. **Future-Proofing:** Ratings drive the adoption of cutting-edge technologies and standards, ensuring that buildings remain well-equipped to meet future connectivity demands.

It is a necessity for TRAI to establish a regulatory framework for ratings of buildings. The framework needs to delineate the standards and criteria that buildings must meet to attain

various rating levels. This should encompass considerations such as coverage, capacity, reliability, technology support, and the incorporation of user experience, gathered through surveys and similar methodologies.

The following are our suggestions for the set of possible sub-criteria, for ensuring the robust and futuristic Digital Communication Infrastructure inside the buildings:

1. Network quality continues to be a hindrance for Indian consumers. We need the adoption of bend insensitive fibre (ITU-T G.657.A2/B3) as the minimum standards for our buildings, to ensure optimal last mile connectivity.

   Continuing the deployment of legacy G.652.D fibre in India poses an increased risk of network failure and compatibility issues with future applications. This vintage fibre has a lifespan of only 10 years due to its susceptibility to bends and significant optical power loss. Therefore, there is an urgent need to upgrade the minimum standard requirements for Optical Fiber (OF) and Optical Fibre Cables (OFC) to be employed in government projects. The ITU-T G.657.A2 bend-insensitive fibre presents an optimal solution, addressing the limitations of the legacy 'D' fibre and offering an extended lifespan of 25-30 years.

2. The rating criteria must encompass sub-criteria related to minimum fire safety compliance confirmations within the overarching criterion 4 – "Digital Connectivity Infrastructure Resilience." This aspect is crucial for mitigating the risk of human casualties and property damage during fire incidents. Specifically, telecom cables such as optical fibre cables and category cables installed within the building should demonstrate fire-retardant properties (resistance to catching fire) and exhibit low smoke generation characteristics.

   Effective cabling plays a pivotal role in the rapid spread of fires, primarily attributed to the prevalence of faulty or inadequate wiring, which frequently leads to short circuits. This issue is a significant contributor to the extensive damage experienced in both life and property, particularly within enclosed structures. India has experienced a considerable number of nationwide fatalities in fire incidents occurring in public and residential buildings, as reported by the National Crime Records Bureau (NCRB). Short circuits have emerged as a prominent cause in these incidents, posing a grave risk to lives due to substandard wiring practices and the neglect of fire safety-rated wiring.

Year	Total No. of Cases		% Cases due to Short Circuit	No of Deaths due to Short Circuit Fire Cases
	Accidental Fire	Short Circuit		
2015	18,450	2,485	13.4	2,255
2016	16,695	2,500	14.9	2,626
2017	13,397	1,886	14.0	1,736
2018	13,099	1,970	15.1	1,719
2019	11,037	2,183	19.8	1,990
2020	9,329	1,943	20.8	1,812
2021	8,491	1,808	21.3	1,657
Total Deaths				**13,795**

3. Moreover, the building rating process should underscore the importance of deploying the appropriate category cabling infrastructure within buildings. International standards and emerging applications increasingly advocate for the use of higher categories in new installations. Additionally, it is imperative to meet the mandatory requirement for consumer premises equipment connectivity.

   The conduit for connecting the Floor Distributor (FD) or Telecommunication Closet (TC) to the Telecommunications Outlet or Information Outlet is provided by Data cabling, specifically Category Cables. These cables play a pivotal role in linking the last-mile equipment, offering significant advantages in terms of connectivity ease. There are essentially two types of mechanical construction for Category cables: Unshielded Twisted Pair (UTP) and Shielded Twisted Pair (STP).

   The process of transmitting data through a copper twisted pair (balanced) conductor is akin to the flow of electrical power. In this mechanism, the data is converted into electrical energy and sent through the conductor. Structured cabling systems utilise copper cables comprising pairs of insulated conductors twisted together, creating a balanced transmission line. ISO refers to this type of cable as a balanced cable, while TIA/EIA labels it Twisted Pair. Twisted pair (balanced) cables exhibit versatility by supporting a wide array of applications, ranging from simple voice to high-bandwidth technology capable of achieving speeds up to 2000 MHz and accommodating data rates up to 40G. Given the escalating demand for emerging applications, it has become crucial to meticulously choose cable designs that align with current and future application requirements. With the continuous evolution of Information & Communication Technologies, there arises a necessity to update data cables in the physical layer. The latest applications mandate higher bandwidth, and these bandwidth-intensive applications require speeds surpassing 1 GB/s in existing Local Area Network (LAN) infrastructures. While Cat5 is confined to a bandwidth of 100 MHz, its speed is limited to a maximum of 1 gigabit per second.

The table found in Clause 4.6.2 of the consultation paper, encompassing rating criteria and their respective weightages, should include the recommended parameters along with mandatory sub-criteria. Specifically:

1. **Under Main Criteria 5: "Future Readiness of Digital Connectivity Infrastructure,"**
   - Bend-insensitive fibre ITU-T G.657.A2/B3 is proposed as the minimum fibre type for last-mile connectivity within the building premises.
2. **Under Main Criteria 4: "Digital Connectivity Infrastructure Resilience,"**
   - The minimum fire safety compliance confirmations are required, along with the adoption of IEC standards for the same.
3. **Under Main Criteria 6: "Provision of Wired Connectivity Infrastructure,"**
   - The building rating process should emphasise the adherence to the right standards/versions for category cabling infrastructure within the buildings.

Incorporating these parameters and sub-criteria into the table ensures comprehensive coverage of critical aspects related to future readiness, resilience, and provision of wired connectivity infrastructure in the building rating process.