COMMENTS
on Consultation Paper
"Proliferation of Public Wi-Fi Networks in India"

Q1. What are the key supply-side constraints affecting Public Wi-Fi proliferation in India? What targeted policy or regulatory measures may be required to address these supply-side constraints? Please provide your response in detail with justification.

There are many supply side constraints that consumers have observed in the Public Wi-Fi services.

1. **Fragmented Ecosystem and Lack of Interoperability**. The Wi-FI services is spatially fragmented and it does not allow easy roaming. Consumers who are used to seamless experiencec with mobile services when on the go, find it inconvenient to move to Wi-Fi Services.

Suggested Policy Measures

1. Mandate interoperability standards such as Passpoint (Hotspot 2.0) or OpenRoaming.
2. Creat a common National SSID architecture for atleast the Government-Supported hotspots
3. Enable Carrier-grade roaming across PDOs and ISPs.

2. Inadequate Last-Mile and Backhaul Infrastructure. The single largest structural bottleneck is the lack of reliable, affordable, and scalable last-mile backhaul connectivity. The Consultation Paper itself notes that fibre penetration remains uneven and that hotspot providers face high provisioning costs and limited wholesale competition.
While BharatNet has expanded middle-mile fibre, last-mile connectivity from Gram Panchayats to Wi-Fi access points remains weak.

Suggested Policy Measures

1. Create a "National Public Wi-Fi Backhaul Grid" using:
    i. BharatNet fibre
    ii. State fibre networks
    iii. RailTel
    iv. PowerGrid telecom fibre
    v. Smart City fibre assets
2. Use Digital Bharat Nidhi (DBN) support for:
    i. Rural fibre extension
    ii. Wireless backhaul
    iii. V-band/E-band microwave
    iv. Satellite backhaul in remote areas
3. Encourage neutral-host infrastructure models similar to:
    i. South Korea's municipal fibre networks

ii. EU publicly funded backhaul systems

3. Poor Commercial Viability of PDOs

The CP indicates that the PDOs operating under the PM-WANI ecosystem presently suffers from:

- Low ARPU
- Small transaction sizes
- High customer acquisition friction
- Low hotspot utilisation
- High recurring bandwidth costs

And hence PDOs are not a viable financial proposition for entreprenuers. Hence it is necessary to make these outlets attractive for more access points especially in rural and unserved areas.

Suggested Policy Measures

1. Introduce viability gap funding (VGF) for:
    - Rural hotspots
    - Tourism zones
    - Educational areas
    - Transport hubs
2. Permit diversified monetisation:
    - Advertising-supported access
    - Sponsored access
    - Data offload partnerships with TSPs
    - Enterprise analytics
    - Smart-city integration
3. Permit telecom operators to subsidise Wi-Fi deployments through traffic offload savings.

4. Complex RoW and Municipal Permissions

There is the perennial problem of obtaining local bodies approvals for various purposes of road cutting, Installing of equipments, etc and this causes significant delays or lack of deployment of infrastructure.

The CP correctly observes that local bodies control essential deployment infrastructure such as: Electric Poles, Bus Shelters, Traffic Lights and Public Buildings and these are necessary if an effective Wi-Fi network had to be established.

Suggested Policy Measures

1. Create a single-window national RoW portal integrated with States and municipalities.
2. Mandate deemed approval timelines.
3. Standardise charges for access to:
    - Bus Shelter
    - Duct access
    - Electricity Poles
    - Street furniture
4. Notify Public Wi-Fi as “essential digital infrastructure”.
5. Link Central grants to States adopting RoW reforms.

5. Security and Trust Deficits

Consumers perceive Public Wi-Fi as inherently more insecure that Mobile Network. This perception has been reinforced by news of Scams and also with programs conducted to increase awareness about scams among the public.

Suggested Policy Measures

1. Mandate the latest security standards like WPA3 certification for new deployments.
2. Mandatory encryption and secure onboarding.
3. Public hotspot should be rated for quality/security so that consumer are assured of security
4. Nudge the network to utitlise AI based security systems

6. Lack of Active Participation by State and Local Governments

The CP highlights that countries with successful Public Wi-Fi ecosystems have active municipal participation. Our experience also suggests that unless the local authorities are not actively participating in the expansion and enhancement of the Wi-Fi network, there would be no robust and efficient Wi-Fi services possible.

Suggested Policy Measures

1. States should be motivated to have Public Wi-Fi missions.
2. There should be Mandatory Wi-Fi provisioning in:
    - Smart cities
    - Bus terminals
    - Panchayat buildings
    - Hospitals
    - Public schools
3. State fibre corporations to support Wi-Fi backhaul.

Q2. What are the major demand-side constraints limiting the uptake of Public Wi-Fi services in the country? What targeted policy or regulatory measures may be required to address these demand-side constraints? Please provide your response in detail with justification.

There are again many demand-side constraints that consumers and our members have observed. In addition, there are a few more that TRAI has listed in the CP. We are mentioning a few major ones with our suggested policy measures.

1. Bundling of Mobile Data and User Convenience

Consumers in India are forced to buy mobile data as almost all the plans are bundled with Mobile data. Also there is the perception that mobile tariffs are lower that Wi-Fi tariffs.

Further, using mobile broadband is extremely convenient and quick compared to the present experience with Wi-Fi network. The factors that make consumer prefer Mobile broadband are, Always-on access, Seamless authentication and Friction less logging into the network.

Suggested Policy Measures

1. Positioning of Wi-Fi as complementary to Mobile by highlighting the efficient usage for High-volume video, Education, AR/VR, Enterprise use and most importantly for Public services.
2. Offer bundled Wi-Fi with mobile subscriptions.
3. Enable automatic Wi-Fi offload.

We believe these measures are completely and effectively implemented Wi-Fi broadband usage will increase significantly and only replace mobile broadband for selected usage situations

2. Poor User Experience

The paper clearlty list the the problems with the current PM-WANI onboarding which are OTP delays, need to purchase Vouchers frequently and hurdles due to Captive Portals.

Suggested Policy Measures

1. Enable one-click onboarding.
2. Introduce SIM-based authentication.
3. Integrate UPI-based authentication/payment.
4. Adopt Passpoint/OpenRoaming.

3. Lack of Awareness and Visibility

Most Consumers are unaware of the availability and the presence of the Wi-Fi hotspots in their neighbourhoods. Some consumers are ignorant about the option of Wi-Fi broad band in addition to Mobile broad band.

Suggested Policy Measures

1. There should be promotion of Wi-Fi as an Option through different media so that consumer are knowledgeable about the service.
2. National hotspot discovery app will enable the identification of nearby access points.
3. Unified branding would enable consumer recall.
4. Visible signage would remind consumer of the Wi-Fi option
5. Digital literacy campaigns which will promote Wi-Fi Services and address the concerns of consumers on security and privacy issues.

4. Security Concerns

As we had pointed out earlier, there is apprehension among consumers that Wi-Fi network is more riskier that Mobile network leading to Fruads and Data theft. This has been reinforced by consumer awareness campaign carried out by various agencies. Also Consumer are not able to distinguish Rogue hotspots from genuine ones.

Some of the regulatory measures suggested have been mentioned earlier paragraphs also.

Suggested Policy Measures

1. Security certification labels.
2. Public awareness campaigns.

3. Consumer protection guidelines.
4. Mandatory encryption.

Q3. Despite the PM WANI initiative, scaling the number of public hotspots across diverse geographies, especially in remote and underserved regions, remains uneven. What are the key challenges in expanding both the density and geographic spread of hotspots, and what strategies could help accelerate more balanced, nationwide coverage? Please provide your response in detail with justification

Based the information that is provided in the CP and our survey, we could say that there quite a few key challenges in expanding hotspot density and geographic spread.

The major challenges include:

1. Weak rural business case
2. Lack of fibre backhaul
3. Low hotspot utilisation
4. Absence of municipal participation
5. Fragmented deployments
6. Limited institutional coordination
7. High operational costs

CCS suggest a few strategies to reduce/overcome the challenges listed

Rural Areas
- DBN-funded backhaul
- Panchayat hotspots
- Community Wi-Fi cooperatives
- Shared infrastructure

Urban Areas
- Smart-city integration
- Municipal pole access
- Metro/bus corridor Wi-Fi
- Neutral-host deployments

High-Footfall Areas
- Mandatory Wi-Fi in:
  - Airports
  - Railway stations
  - Malls
  - Stadiums

Institutional Strategy

Create a National Public Wi-Fi Mission with State targets, Municipal targets and Funding-linked KPIs

Q4. What changes, if any, are required in the existing PM-WANI framework to improve revenue certainty and long-term sustainability for PDOs/PDOAs? Please provide your response in detail with justification.

Based on the information available in the consultation paper and our survey, our conclusion is that there are many factors that are affecting the sustainability of the PDOs/PDOAs.

Recommended Reforms - PDO Level

1. Revenue Model Reforms

The consumer reluctance to switch over or increase usage of the Wi-Fi services adversely affect the revenue of the PDOs/PDOAs. While improving the trust and convenience of the Wi-Fi network would defintely increase the customer base, depending on a single stream of revenue would not be sustainable.

We suggest that the following additional streams of revenue be considered as part of the business model.

- Advertising-supported access
- Enterprise sponsorships
- Venue partnerships
- Smart-city integration
- Data offload revenue sharing

2. Better User Experience

The entire gamut of the user experience should be improved as mentioned earlier. These include User Authentication, Seamless Roaming, Easier Payment options like UPI.

Further, the user should not face any harm due to his usage of the Wi-Fi like like Fraud, Data or Identity theft or Privacy issues. This means that the entire ecosystem should have the highest level of security that is currently feasible.

To ensure that the customer experience is consistent across the entire Wi-Fi Grid, the minimum QoS standards should be formulated and implemented successful. In the eventuality of standards not being met, the user should have pathways for a quick and fair resolution of the issues.

Recommended Reforms - PDOA Level

The changes that are necessary at this level are

1. Backhaul Support

Newer approaches are necessary to provide adequate backhaul support. These could include

- Regulated wholesale bandwidth pricing
- Shared municipal backhaul
- DBN support

2. Aggregation Models
To ensure that the PDOA are financially profitable, it is necessary to encourage PDOA consolidation to achieve economies of scale.

3.Infrastructure Sharing
The sharing of Infrastructure is necessary to wider coverage and also reduction in capital expenses which would lead to PDOs and PDOAs being sustainable. The infrastructure share would be of Power Poles, Fibre, Ducts and also Access points.

Q5. Are there any other challenges currently faced by PDOAs/PDOs? If yes, what changes can enhance the participation of entrepreneurs under the PM-WANI framework? Please provide your response in detail with justification.

Yes. Additional challenges include:

1. Low consumer trust
2. High customer acquisition costs
3. Limited digital literacy
4. Power supply issues
5. Hardware maintenance burden
6. Taxation and compliance uncertainty
7. Lack of discoverability
8. Fragmented apps and interfaces

Suggested Measures

1. Standardised PM-WANI app ecosystem
2. Plug-and-play certified equipment
3. Low-cost financing
4. GST concessions for rural Wi-Fi equipment
5. Shared maintenance support
6. Municipal infrastructure access
7. PDO training and certification programmes

Community-level awareness programmes through Panchayats and schools can also increase viability.

Q6. Are there improvements needed in the Authentication, Authorization, Roaming, and Payment architecture of the PM-WANI Framework? Please share suggestions, if any. Please provide your response in detail with justification.

Yes. This is one of the most critical reform areas. The present OTP-based architecture is outdated and introduces friction.

Recommended Improvements

1. Replace OTP-Based Authentication
Move toward better ways of authentication like Passpoint/Hotspot 2.0, EAP-SIM/EAP-AKA and OpenRoaming
These systems allow automatic secure authentication.
The consultation paper itself recognises global migration toward such systems.

2. UPI-Based Authentication and Payments
Currently the payment architecture of PM-WANI is not smooth and hence there is Integrate UPI Lite, UPI AutoPay and Tokenised authentication
These payment methods provide consumer the benefits of Reduced friction leading to better scalability.
TRAI itself discusses UPI integration positively.

3. National Wi-Fi Identity Framework
Create federated digital identity support through other digital initiatives like Mobile numbers, DigiLocker and Aadhaar-based optional consent frameworks.

4. Seamless Roaming
Seamless Roaming has to an essential feature of the Wi-Fi network through Inter-ISP roaming, National hotspot federation and Unified roaming agreements. The EU and OpenRoaming ecosystems provide strong models.

5. Security Upgrades
TRAI should mandate that the Wi-Fi network should have the latest set of security measures including WPA3, Device certification, Network encryption and AI based Fraud detection.
This is absolutely essential to build consumer trust in the network, especially in the current situation of endemic scams.

Q7. In the Indian context, which of the following models would be more appropriate for the proliferation of Public Wi-Fi?
a. A model where the Government actively ensures hotspot deployment through direct funding and implementation support, including backhaul provision; or
b. A model where the Government primarily ensures availability of robust backhaul infrastructure and intervenes in hotspot deployment only in cases of market failure.
Please provide your response in detail with justification

CCS believes that if a single model is to be chosen that it would be model b, where the Government primarily ensures the availability of a robust backhaul infrastructure and intervenes in hotspot deployment only in cases of market failure.

This approach is likely to be more appropriate for the proliferation of Public Wi-Fi for the following reasons.

1. The Real Bottleneck in India Is Backhaul and Shared Infrastructure. Hence investing government resources in the backhaul infrastructure would yield the most impact

2. Internationally the Backhaul-led models are more sustainable.

Sl. No	Country	Model
1	South Korea	Municipal fibre + private service participation
2	Singapore Wireless@SG	Government-enabled backbone + operator participation
3	EU WiFi4EU	Public funding + local deployment responsibility
4	UK GovWifi	Federated access architecture
5	Japan	Municipal coordination + operator ecosystems

3. The development of Public Wi-Fi across India requires massive investment. This would require the involvement of Private sector. Further with Private sector associated in the front end would ensure innovation and more responsive customer service.
However it likely that market led hotspot deployment may not work in a few situations leading to Model (a) being selectively followed. These situations could be :

- remote rural areas,
- tribal regions,
- border regions,
- low-income communities,
- educational institutions,
- and socially important public infrastructure.

Thus a more appropriate model would be a hybrid differentiated model combining elements of both approaches.

Annexure-I demonstrates that Public Wi-Fi can deliver connectivity at significantly lower effective per-GB cost than mobile broadband, thereby generating substantial consumer welfare and digital inclusion benefits. This strengthens the case for Government intervention in underserved areas where market incentives alone may be insufficient.

Q8. Is there a need to adopt separate strategies for Public Wi-Fi proliferation in rural and urban areas? If yes, suggestions may be provided. Please provide your response in detail with justification.

Yes. India should adopt clearly differentiated strategies for Public Wi-Fi proliferation in rural and urban areas because the two ecosystems differ fundamentally in many aspects. We highlight 3 main areas.

1. **Infrastructural Hurdles.** In the Rural areas, some of constraints are Limited Fibre, Difficult Terrain (Distances and topography) and Unreliable Electric Power. In the case of Urban areas the constraints are like RoW bottlenecks, Congestion, Interference

2. **Economic Realities**. Urban areas in India are High Population Density areas, with good demand from Enterprises leading to high revenues from advertising and telecom offloads, motivating the private sector to activly participate. In contrast the Rural areas have Low Population density with limited paying capacity spread over a large areas leading to high infrastructure costs and weak moneetisation potential. Thus in the rural areas Wi-Fi is primarily a digital inclusion intervention while in urban areas it would be a digital capacity and smart-ciity infrastructure intervention.

3. **Usage Patterns**. The major usage in Rural areas is likely to E-goverance, Agricultural Information, Telemedicine, Education and Digital Payments by mainly at the household and school locations. In the Urban areas the High usage activities would be Commerce, Smart City Services, Enterprise Connectivity, Tourism (Transport Hubs and Tourist spots)

Recommended Rural Public Wi-Fi Strategy

Strategic Objective should be “Digital Inclusion and Essential Connectivity”. Rural Public Wi-Fi should primarily function as a public digital access layer, with community connectivity infrastructure, and digital public service delivery platform.

Rural Infrastructure Strategy

1. BharatNet-Centric Architecture
2. Multi-Technology Backhaul
3. Community Network Models

Recommended Urban Public Wi-Fi Strategy

Strategic Objective should be “High-Capacity Seamless Public Connectivity”. Urban Public Wi-Fi should function as telecom offload and mobility infrastructure and commercial digital ecosystem support.

Urban Infrastructure Strategy

1. Dense Small-Cell and Wi-Fi Integration
2. Shared Urban Infrastructure
3. Neutral-Host Architecture

Despite differentiated strategies, certain national frameworks should remain common:

- cybersecurity standards,
- QoS standards,
- interoperability,
- consumer protection,
- privacy safeguards,
- OpenRoaming architecture,
- trusted certification frameworks.

Q9. What measures can be taken to improve the deployment and uptake of Public Wi-Fi networks in high-footfall areas for both outdoor (such as bus stops, roadside transit points, open public parks, markets, tourist sites), and indoor (such as airports, railway stations, malls, public institutions)? Please provide your response in detail with justification, separately for outdoor and indoor scenarios.

A. OUTDOOR HIGH-FOOTFALL AREAS

Measures for Improving Outdoor Deployment and Uptake

1. Smart Street Infrastructure Integration

Integrate Wi-Fi into the Street furniture Infrastructure would reduce deployment cost, RoW complexities and delays snd reduce power provisioning challenges

2. Municipal Shared Infrastructure Frameworks

Urban Local Bodies should provide access to duct and street furniture to enable sharing with all the players significantly loweing deployment barriers.

3. OpenRoaming and Seamless Authentication

Outdoor environments require rapid onboarding, roaming continuity, and minimal user friction.

4. Tourism and Hyperlocal Commerce Integration

Outdoor Wi-Fi should support local discovery of shops and retail outlets, with tourist information.

5. Weather-Resilient Infrastructure

Outdoor deployments should be able to withstand adverse climatic conditions and should be tamper proof. These should preferably powered by Solar Electricity.

6. AI-Based Congestion Optimisation

Dense outdoor environments should support AI-assisted traffic steering and predictive congestion management,. As there would be possibilities of large gathering for Social and Religious events, there should be dynamic spectrum allocation to handle the peak temporary usage.

7. Safety and Emergency Features

Outdoor hotspots should support emergency alerts, disaster notifications, emergency SSIDs, and public safety communications.

Measures for Improving Uptake in Outdoor Areas

1. Unified Branding and Discovery

Users often cannot identify trusted hotspots. Hence the following measures would increase uptake. Common SSID frameworks, visible signage and national hotspot discovery platform are essential.

2. Free Basic Access + Premium Tier

A freemium model should provide limited free access and above that limit have higher speed premium packages. This model would increase usage and would be financially sustainable.

3. Local Language Interfaces

Tourism and public access hotspots should support multilingual onboarding, accessibility features and voice-assisted interfaces.so that the services are targetted to a larger population.

PART B — INDOOR HIGH-DENSITY ENVIRONMENTS

Measures for Improving Indoor Deployment

1. Carrier-Grade Wi-Fi Architecture

Indoor deployments should support the latest Wi-Fi Standards and be based on enterprise grade architecture for Instant Access, Seamless Roaming, High Intensity Load.

2. Integrated Fibre and Edge Computing

Indoor deployments should integrate high-capacity fibre system with Local Edge Caching, CDN integration and Local Authenication Nodes to ensure that there is low latency and reduced authenication delays resulting better customer experience.,

3. Seamless Mobility and Authentication

Indoor mobility requires uninterrupted roaming, session continuity and friction less onboarding which could be achieved with Wi-Fi alliance standards like OpenRoaming, Passpoint etc to achieve near cellular-like experience.

4. PPP Models for Public Infrastructure

Airports, railway stations and metro systems should adopt PPP-based deployment with Revenue Sharing Models and Advertising supported systems.

5. Neutral-Host Indoor Connectivity

Neutral-host indoor connectivity which allows multiple Service Providers to share a single, unified in-building network, by supporting Wi-Fi, 5G Small cells, IoT systems results in sprectrum efficency and cost optimisation**.**

Measures for Improving Uptake in Indoor Area

1. Zero-Click Onboarding

Indoor users expect instant connectivity and so the current OTP system should be discontinued and automatic authentication should be mandated. With user convenience increasing, more consumer would transistion to Wi-Fi network.

2. QoS Assurance

Another factor that play an important role is the assurance of service quality. Users abandon poor-quality Wi-Fi rapidly. So it is necessary to establish QoS standards for Minimum throughput, Latency and Congestion that provides a high quality experience.

3. Consumer Trust and Security

Another perception of the consumer that impact their adoption and usage of Wi-Fi Services is that Wi-Fi network are risky. With Security and Privacy being given top most importance through measures like Security standards WAP3, Secure DNS, Rogue AP detection and Privacy-by-Design Principles.

4. Integrated Digital Services

Integrating Indoor Wi-Fi with other services like Ticketing (all types), Retail Discovery, Tourism Information would more value to the Wi-Fi network and attract more consumers.

Common Recommendations for Both Outdoor and Indoor Areas

1. National Public Wi-Fi Observatory

Create a national monitoring platform for various indicators like Congestion, Uptime, QoS standards along with reporting of security incidents and usage analytics to enable innovation, security and better performance of the network.

2. AI-Managed Public Wi-Fi

Future dense Wi-Fi ecosystems should support predictive optimisation, automated interference mitigation,

- dynamic traffic steering.

3. Green Connectivity Standards

Encourage:

- energy-efficient APs,
- solar-powered deployments,
- smart sleep modes.

Q 10. If the Government decides to provide financial support for the proliferation of Public Wi-Fi, which funding mechanisms would be most suitable for India? Should a uniform funding mechanism be adopted nationwide, or should differentiated funding mechanisms be used for rural, urban, and high footfall areas? Please provide your response in detail with justification.

International experience clearly demonstrates that Public Wi-Fi ecosystems rarely become universally sustainable through purely market-driven approaches, particularly in rural areas, low-income communities, remote geographies, and socially important public institutions.

So we suggest that a differentiated funding mechanism rather than a uniform nationwide funding model. Different geographic and economic contexts require different funding

structures because user density, commercial viability, infrastructure cost, and socio-economic objectives vary substantially across the regions.

1. Rural Areas are typically low user density and weak purchasing power. Further the infrastructure in these have a high cost leading poor commerciala viability
2. Urban Areas have a high user density with good purchasing power. These areas as the result have higher advertising potential. Private sector is willing to invest in these areas.
3. High-Footfall areas havethe highest number of users with high purchasing power. The areas also have high data demand. This results in substantial economic externalities, and and commercial monetisation opportunities.

Thus funding models will differ significantly. We sugges that India should adopt a Three-Tier Differentiated Funding Framework

SN	Areas Type	Funding Model	Justification
1	Rural	Digital Bharath Nidhi + Viability Gap Funding + Community Funding (SHG, Panchayat, CSC)	Needs substantial support as commercial returns are poor as mentioned above. Further, as there are significant social benefits Government should be provide high level of support
2	Urban	Market based Mechanism + Tax Incentives	High commercial viability with multiple streams of revenues. Hence the Government support is minimal.
3	High Footfall	PPP + Revenue Sharing	

Q11. What criteria should govern the allocation and disbursement of funds across rural, urban, and high-footfall areas, respectively? Please provide your response in detail with justification.

The objective of the allocation of funds should the maximise the number of consumers who are likely to achieve greater welfare. Based on this the allocation criteria for the 3 areas would be different.

The weightage that each of the criteria carry is provided in the bracket.

Allocation Criteria for Rural Areas

1. Connectivity Deficit (30 %)
Higher funding priority should be given to areas with low broadband penetration, poor mobile coverage and inadequate fixed-line infrastructure.
2. Population Covered (15%)
Funding should consider the population in the catchement area. Higher the population served more should be the funding.

- village population,
- catchment population,
- nearby settlements.

3. Public Institution (20 %)

Priority should be given to locations with schools, colleges, PHCs, Panchayat offices,and Common Service Centres.

4. Socio-Economic Status (20 %)

Areas that have a higher number of population from lower income and marginalised coomunities like Tribes should be havea higher funding support and hence the Socio-economic status should have a weightage.

5. Availability of BharatNet Infrastructure (15 %)

Areas with BharatNet PoPs should receive proportinately higher funding as the deployment costs are lower and sustainability is likely to be higher.

Allocation Criteria for Urban Areas

1. Demand Density (25 %)

Funding priority should be based on population density and data demand density so that areas that have the maximum demand are priortised. Network congestion indicators can be take as a surrogate measure.

2. Public Utility Value (25 %)

Priority should be given to public transport nodes, government service centres, educational institutions and public healthcare facilities.

3. Infrastructure Sharing Potential (20 %)

Higher scores should be assigned where common ducts exist, smart poles are available and municipal fibre exists, so that existing facilities are utilised and areas are speedily transformed to a robust network area.

4. Smart-City Integration Potential (15%)

Projects/Areas integrated with traffic management, surveillance, IoT and environmental monitoring should receive additional support.

5. Commercial Sustainability (15%)

Projects with partial self-sustainability should receive preference.

Allocation Criteria for High-Footfall Areas

1. Daily Footfall (35%)

This is the most important criteria for these areas and has been accorded the status of Primary criterion. Both these factors should be considered: Average Daily Users (AUD) and Seasonal Peak Demand. (SPD)

2. Public Importance (20%)

Higher priority should be assigned to usage that is of Public necessity like transport hubs, pilgrimage centres and tourism sites.

3. Telecom Offload Potential (20%)

Funding should be available for those location that would contribute to reduction in mobile congestion and traffic offloading benefits.

4. Economic Activity Supported (15 %)

Areas which have Projects enabling tourism and commerce should been given priority due to the social benefits that is likely to occur.

5. Venue Contribution (10%)

Projects where venue owners contribute infrastructure should receive preference.

Q12. Is the lack of adequate and reliable last-mile connectivity a critical constraint for the proliferation of Public Wi-Fi in the country? If yes, what specific measures may be considered by the Central Government, State Governments, and local bodies to address the last-mile constraints? Please provide your response in detail with justification.

Yes. The lack of adequate, reliable and affordable last-mile connectivity is one of the most significant constraints to the proliferation of Public Wi-Fi networks in India.

While substantial progress has been made through BharatNet, 4G/5G expansion, PM-WANI, and increasing fibre deployment, the availability of robust backhaul and last-mile connectivity remains uneven, particularly in: rural areas, tribal regions, hilly and remote areas, urban slums, peri-urban settlements, and many public institutions.

The challenge is no longer primarily the availability of Wi-Fi equipment; rather, it is the absence of reliable and affordable backhaul connectivity to support sustainable hotspot operations.

The consultation paper itself highlights that Wi-Fi delivers connectivity at significantly lower effective cost per GB than mobile broadband and becomes particularly efficient when connectivity is shared among multiple users. Therefore, investment in last-mile infrastructure generates substantial consumer welfare and digital inclusion benefits.

Measures by the Central Government

A. Accelerated BharatNet Utilisation

The Central Government should ensure:open and non-discriminatory access to BharatNet, simplified access procedures, standardised wholesale pricing, and rapid provisioning to Public Wi-Fi operators.

BharatNet already represents a substantial public investment and should become the foundational backhaul layer for rural Public Wi-Fi.

B. Creation of a National Open Access Backhaul Framework

Government of India should Establish a National Open Access Digital Connectivity Framework covering BharatNet, RailTel networks, power utility fibre, highway fibre, and municipal fibre.

Shared infrastructure use reduces duplication and lowers deployment costs.

C. Digital Bharat Nidhi Support

Digital Bharat Nidhi funding should prioritise uncovered villages, tribal regions, and other poor connectivity areas.

Without the Governmental support, in areas of poor commerical opportunities, investment will not flow for infrastructure,. Hence this is an important measure.

D. National Utility Policy

The Government should formulate a Common Utility Corridor policy which covers the Highways, Smart Cities, Industrial Areas and Urban redvelopment projects to ensure rapid infrastructure deployment.

Measures by State Governments

A. Uniform RoW Implementation

States should fully implement RoW reforms through Single-window systems, Time-bound approvalsand standardised charges,

B. State Fibre Missions

State Governments should establish State Digital Connectivity Missions to coordinate fibre expansion, utility access and smart-city infrastructure. There should be provision and mandate for municipal participation.

C. Access to State Infrastructure

States should permit shared use of electricity poles, transport infrastructure and public buildings.

Measures by Local Bodies

A. Simplified Local Approvals

Municipalities and Panchayats should standardise documentation and time bound approvals.to reduce processing times.

B. Street Furniture Access

Local bodies should provide transparent access to traffic poles, public buildings, and community centres.

C. Community Connectivity Hubs

Local Bodies should facilitate hotspot deployment at Gram Panchayat offices, schools, PHCs, and CSCs.

D. Local Infrastructure Registries

Each municipality should maintain a Digital Infrastructure Registry mapping fibre, ducts, poles, and public assets.

Q13. Is there a need for the Government to provide funding for provisioning of last mile connectivity in the uncovered or underserved areas for Public Wi-Fi networks? If yes, which funding option is best suited in the Indian context, and what should be the criteria for rural, urban, and high footfall areas, respectively? Please provide your response in detail with justification.

Yes. Government funding is necessary for provisioning last-mile connectivity in uncovered and underserved areas because the social and economic benefits of Public Wi-Fi frequently exceed the commercial returns available to private investors.

The evidence in Annexure-I shows that Public Wi-Fi can deliver significantly lower effective data costs than mobile broadband, creating substantial:consumer welfare gains, digital inclusion benefits, educational opportunities, productivity improvements, and economic participation.

However, many underserved areas suffer from low revenue potential, sparse populations, difficult terrain in addition to high deployment costs.

Consequently, purely market-based investment is often insufficient. Government support is therefore justified on both universal access and also economic welfare reasons.

Q25. What monetisation models are most appropriate for rural, urban, and high footfall locations, respectively? Please also suggest any additional monetisation models that may be suitable in the Indian context. Please provide your response in detail with justification.

Public Wi-Fi sustainability in India ultimately depends on the development of viable and context-sensitive monetisation models. A single uniform monetisation model is unlikely to succeed across the country due to wide variation on many factors as mentioned earlier. In the Indian Context only a differentiated monetisation frameworks adapted to different locations will be workable.

International experience demonstrates that the most successful Public Wi-Fi ecosystems globally use hybrid monetisation approaches, indirect revenue models, infrastructure sharing, advertising and digital ecosystem integration rather than pure pay-per-use systems.

Most Suitable Rural Model

Rural Public Wi-Fi should prioritise affordability, public service delivery and shared community value, rather than aggressive profit maximisation. Based on the primary objective there could many types of monetisation Models for Rural areas.
However we suggest a model that has 2 important components that focuses on Affordability and Sustainability.

1. Government Institutions like Panchayat Offices, and Government supported institutions like Schools, Agricultural Centres would act as anchor users generating a predictable baseline demand. This will ensure the financial viability ensuring sustainability.
2. Pricing would be Freemium. The users would have free basic daily access to essential services with premium paid plans for higher speed, extended usage. This ensures that there is inclusion because of the affordable pricing.

Most Suitable Urban Model

Urban Public Wi-Fi environments generate high consumer engagement, mobility analytics, and local commerce opportunities. Urban areas as mentioned earlier have the options of multiple revenue streams including location-based advertising, retail promotions, tourism advertising and contextual commerce.

Urban Wi-Fi infrastructure may support CCTV, IoT, Traffic systems, Environmental monitoring and smart governance applications. Revenue may arise through municipal smart-city contracts and integrated infrastructure sharing.
Another revenue stream is from Telecom Offload Partnerships, when Telecom operators can offload to the Wi-Fi network, with the Wi-Fi complementary telecom infrastructure.

Model for High-Footfall Areas

These area are high people density with large data consumption. The recommended structure would be Free basic access with Premium paid high-speed tiers resulting in higher revenue which would attract PPP. Venue based Partnership model would be the preferred model in these locations.

There are services that would be offered which include Analytics and Crowd Intelligence Services. Further, there opporunity for event based Temporary Monetisationwith deployment for festivals, sporting events, concerts, and religious gatherings., like sponsorship, premium access, event analytics and advertising.

Recommended Monetisation Models

Sl.No	Area Type	Most Suitable Monetisation Models
1	Rural	Freemium + Government Anchor Demand + Community Cooperatives
2	Urban	Advertising and other Revenue Streams + Smart City Integration + Telecom Offload
3	High Footfall	Premium Freemium + Sponsorship + Paid Services

Q26. Please provide any additional comments, observations, or suggestions related to the proliferation of Public Wi-Fi in the country, including any potential issues or considerations that may not have been covered in the sections above. Please provide your response in detail with justification.

India stands at a unique moment in the evolution of digital connectivity. While The country has already demonstrated globally significant success in many digital initiatives like UPI, Aadhaar, Digilocker, Public Wi-Fi now presents an opportunity to create India's next foundational digital access layer.

Hence Public Wi-Fi should not be viewed merely as a hotspot deployment exercise, or a low-cost internet access scheme. Instead, it should be conceptualised as a national digital participation infrastructure that enables

- digital inclusion,
- economic participation,
- public service access,

- smart-city systems,
- educational equity,
- disaster resilience,
- and future AI-enabled public services.
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Public Wi-Fi Should Be Recognised as Digital Public Infrastructure (DPI)

The guiding principle should be:

> "Public Wi-Fi should evolve into an open, intelligent, interoperable and inclusive national digital access infrastructure that supports India's future digital economy, AI ecosystem and public service architecture."

India will benefit far more from a **consumer welfare maximisation** or **social welfare optimisation** model for Public Wi-Fi rather than purely commercial or telecom-centric models.