Wireless Broadband Alliance

Proliferation of Public Wi-Fi Networks in India

WBA Stakeholder Response to TRAI Consultation

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About the Wireless Broadband Alliance

Wireless Broadband Alliance (WBA) is the global organization that connects people with the latest Wi-Fi initiatives. Founded in 2003, the vision of the WBA is to drive seamless, interoperable Wi-Fi services experiences within the global wireless ecosystem. The WBA's mission is to bring together global industry leaders, collaborating to accelerate the development, integration and adoption of next-generation Wi-Fi and wireless technologies to deliver business growth, through innovation, technical and standards development, and real-world deployment programs. Its key programs include NextGen Wi-Fi, OpenRoaming, 5G, 6G, IoT, Smart Cities, Testing & Interoperability and Policy & Regulatory Affairs.

Membership in the WBA includes major operators, service providers, enterprises, hardware and software vendors, and other prominent companies that support the ecosystems from around the world. The WBA Board comprises influential organizations such as Airties, AT&T, Boingo Wireless, Boldyn Networks, BT, Charter Communications, Cisco Systems, Comcast, HFCL, HPE, Intel, Reliance Jio, RUCKUS Networks, Telecom Deutschland and Turk Telekom.

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Preamble

The Wireless Broadband Alliance (WBA) welcomes TRAI's consultation on the proliferation of public Wi-Fi networks in India and commends the Authority's decision to undertake a fundamental rethinking of the PM-WANI framework. WBA is the global industry body responsible for defining and operating the WBA OpenRoaming™ federation — one of the key industry initiatives called out by consultation paper as a possible the basis for India's national public Wi-Fi roaming layer.

WBA's membership includes major network operators, identity providers, and technology companies across the global Wi-Fi ecosystem, including Reliance Jio, AT&T, BT, Cisco Systems, Comcast, Broadcom, Intel, Boingo Wireless, Boldyn Networks, HPE and others. WBA has operated the OpenRoaming federation since 2019, and in January 2026 signed a Memorandum of Understanding with the Tokyo Metropolitan Government to deploy OpenRoaming citywide across Japan's capital — the first city-level government adoption of the standard.

WBA submits these comments in response to each question raised in the consultation paper.

Status Assessment and Strategies for Proliferation

Question 1

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.

WBA Position:

WBA has successfully driven the supply side availability of OpenRoaming functionality that enables the accelerated adoption of scalable, secure, seamless public Wi-Fi services. WBA runs the OpenRoaming certification program, ensuring necessary functionality for supporting OpenRoaming can be sourced across the manufacturer ecosystem. OpenRoaming certified partners are listed on the openroaming.org website:

- https://wballiance.com/openroaming/certified-partners/

OpenRoaming delivers the critical federation layer, that can be positioned at enhancing the network-effect for the PW-WANI ecosystem.

Question 2

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.

WBA Position:

Two demand-side constraints dominate: the current friction associated with network identification and authentication makes Wi-Fi inconvenient. Security distrust associated with unsecured Wi-Fi networks makes users weary of using Wi-Fi, especially for performing sensitive transactions; a perception that is re-enforced by mobile operating systems warning users about unsecured networks.

Enhancing the PM-WANI architecture to support seamless and secure Passpoint based authentication will address these constraints.

Question 3

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.

WBA Position:

Urban density is primarily a commercial viability problem; rural spread is primarily an infrastructure and economics problem. Differentiated strategies are required for each. In urban environments, following the example of Tokyo Metropolitan Government (TMG), deployment of PM-WANI can be linked to public contracts or licenses. Moreover, the ability to leverage PM-WANI instrumentation to link into venue and vertical specific value chains has proven to a key driver of OpenRoaming adoption worldwide, while high footfall venues can deliver the required commercial incentives to drive the adoption of OpenRoaming-settled propositions.

In contrast, in rural environments, footfall may be too low to drive commercial deployments without additional subsidy.

Irrespective of environment, OpenRoaming federation creates the necessary network-effect where each new hotspot adds value to the entire network.

On the spectrum regulatory side, India has taken an important first step by delicensing the lower 6 GHz band (5925 – 6425 MHz) for low-power indoor and very-low-power operations. However, the current framework does not yet permit outdoor standard-power RLAN operation under an Automated

Frequency Coordination (AFC) mechanism. This limitation constrains the ability of public Wi-Fi networks to scale efficiently across dense urban areas, transportation corridors, campuses, industrial zones, rural communities, and other underserved regions.

Standard-power Wi-Fi operation in the 6 GHz band would enable significantly larger coverage areas compared with indoor-only low-power deployments, higher permitted power levels would reduce the number of access points required to provide coverage in public spaces, thereby lowering deployment complexity and infrastructure costs, particularly for remote and underserved regions.

In addition, standard-power RLAN systems in the 6 GHz band can support outdoor mesh networking and point-to-point/multi-point wireless bridge links, which are particularly valuable in areas where fibre or wired backhaul deployment is difficult or economically challenging. Such capabilities can provide flexible and cost-effective wireless backhaul connectivity for public Wi-Fi hotspots, especially in rural, semi-urban, geographically challenging, or rapidly deployable environments.

Accordingly, enabling AFC-based standard-power outdoor RLAN operation in the 6 GHz band would materially strengthen the scalability, affordability, and geographic reach of public Wi-Fi deployments in India, while supporting the broader objectives of PM-WANI.

Question 4

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.

WBA Position:

Revenue certainty requires three structural changes: competitive tariffs, a clear settled-service settlement framework, and diversified monetisation pathways. WBA's OpenRoaming legal framework defines the immutable terms required to scale the adoption of settled service, avoiding the need for complex and costly bi-lateral agreements, while enabling the customers of IDPs to seamlessly and securely roam across the federation's access networks. The OpenRoaming framework then facilitates the definition of a TRAI-defined super-aggregator that operates as an OpenRoaming-compatible clearing service.

A common PM-WANI architecture that supports both settled and settlement-free service drives further diversity in economic models, with those venues able to use PM-WANI to support vertical-specific value propositions able to offer lower priced, or even free, PM-WANI access.

Question 5

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.

WBA Position:

Three additional challenges — technical complexity, certificate governance, and lack of a hub model are identified. Enhancing the PM-WANI architecture framework to allow PDOAs to operate as hubs, where they can offer to outsource specific PW-WANI functionality from hotspot providers, including certificate registration authority functionality, RadSec based security and clearing drives competition and innovation, while lowering barriers to adoption for those hotspots that partner with PDOA-hubs.

Question 6

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.

WBA Position:

WBA advocates the use of Passpoint-based authentication and authorization to deliver a scalable, secure and seamless authentication experience. While the earlier definition of OpenRoaming service levels addressed necessary requirements to ensure a minimum baseline of service levels on all OpenRoaming access networks, more recent adoption of quality instrumentation shared in authentication signalling provides the likes of Mobile Network Operators, who may have access to alternative access propositions, critical quality instrumentation, enabling the MNOs to be confident in the exceptional experience delivered using OpenRoaming and Passpoint.

OpenRoaming ensures that only identities managed according to ISO/IEC 29115 defined requirements are able to access via the federation, with the ability for TRAI to require the adoption of Level of Assurance 3, the highest tier in the OpenRoaming specification, that delivers a high confidence in the asserted identity. Other aspects already included in the OpenRoaming architectural framework include the explicitly signalling of whether the user has agreed to share an immutable identifier with the hotspot provider, enabling the hotspot provider to use the identifier in supporting their venue-specific value propositions. Finally, the use of DNS and PKI have proven to be critical in enabling the OpenRoaming federation to scale – the integration of DNS based discovery from independent hotspots into GSMA's IR.61 facilitates the adoption by all mobile network operators.

Question 7:

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.

WBA Position:

Option (b) is the correct structural choice — Direct government deployment of hotspots (Option a) has a poor track record globally. Government-operated Wi-Fi infrastructure tends to be underutilised, poorly maintained, and displaced as commercial alternatives improve. Option (b) aligns incentives correctly: government invests in the infrastructure layer where market failure is structural; commercial operators invest in the access layer where the market can function if infrastructure is available.

Question 8

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.

WBA Position:

Yes — rural and urban deployments have fundamentally different economics, use cases, and infrastructure constraints, and require differentiated frameworks built on a common enhanced technical foundation. OpenRoaming enables such differentiated propositions to be built on a common framework, for example enabling rural areas to offer a bronze tier of service, while enabling urban areas to offer a higher service level that incentivises adoption of the service in environments where competitive cellular access is available. Both strategies can be built on the same technical foundation to ensure seamless, secure and scalable user experiences across all environments.

Question 9

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.

WBA Position:

High-footfall areas are the most commercially viable opportunity for PM-WANI. The primary intervention is the needed is mandate rather than subsidy. Using the example of Tokyo Metro Government (TMG), local government can provide financial support, for example covering up to 1/2 or 3/4 of costs to local municipalities to install or convert existing Wi-Fi to the OpenRoaming standard. TMG offers "hands-on" technical support for planning and formulating deployment strategies, particularly for evacuation shelters and high-traffic public areas. With public facilities, TMG has deployed OpenRoaming across hundreds of government buildings, schools, hospitals, and museums. TMG has partnered with fixed line provider NTT East, converting approximately 1,500 public phone booths into OpenRoaming Wi-Fi hotspots.

Role of Government: Funding Deployments

Question 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.

WBA Position:

Differentiated funding is desirable. WBA recommends a three-tier framework aligned with deployment context.

- Tier 1: Rural and underserved areas — grant-based
- Tier 2: Urban public spaces — partial subsidy, following TMG approach
- Tier 3: High-footfall commercial venues — consider market intervention to incentivise deployments without subsidy

Question 11

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.

WBA Position:

Criteria should be objective, verifiable, and outcomes-linked — with disbursement tied to deployment and usage metrics, not planning approvals.

Role of Government: Backhaul Provisioning and Funding

Question 12

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.

WBA Position:

Yes — last-mile connectivity is a critical infrastructure constraint on PM-WANI deployment. WBA provides no specific measures to be considered, although highlights important role of state governments in enabling the acceleration of public Wi-Fi adoption.

Question 13

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.

No specific WBA response.

Facilitative Role: States and Local Bodies

Question 14

Are there any RoW challenges faced by service providers in accessing public places or street furniture to install Public Wi-Fi hotspots? If yes, details may be provided along with suggestions for improvements. Please provide your response in detail with justification.

No specific WBA response.

Question 15

What facilitative roles can State Governments play in accelerating Public Wi-Fi deployment across rural, urban, and high-footfall areas, respectively? Should States consider deploying Public Wi-Fi networks at the municipal and gram panchayat level? Please provide your response in detail with justification.

WBA Position:

States can play a critical role in driving PM-WANI adoption. States can define a “Connected State” Development Policy that integrates PW-WANI into broader connectivity programmes, with goals to ensure that all residents and state visitors can connect seamlessly and securely to high-speed networks. State government can incentivise large-scale PW-WANI deployment through innovative projects like accelerating deployments in public facilities, as well as providing awareness programs for end-users and PW-WANI stakeholders.

Question 16

Should the State Government need to take initiatives to improve the availability of last-mile connectivity for Public Wi-Fi networks? If yes, what measures can incentivise States /municipalities to undertake city- and town-level fiberisation to ensure Public Wi-Fi network proliferation? Please provide your response in detail with justification.

No specific WBA response.

Question 17

What facilitative roles can local bodies play in accelerating the deployment and sustainable operation of Public Wi-Fi networks in rural and urban areas? Please provide your response in detail with justification.

WBA Position:

Local bodies are the primary catalyst in accelerating deployment. Their ability to drive policy that results in large-scale infrastructure deployment is key. Using the example of TMG, innovative projects including promoting deployments in public facilities, repurposing existing assets, as well as facilitating the deployment of new multi-functional sites have been critical to the success in OpenRoaming deployment.

Incentivising Service Providers

Question 18

What regulatory or policy incentives, schemes or programs are required to promote active participation of TSPs and ISPs in Public Wi-Fi deployment? Please provide your response in detail with justification.

WBA Position:

The most powerful scheme to promote participation by TSPs is to first lower the barriers to adoption. The integration of OpenRoaming into GSMA's DNS hierarchy together with seamless EAP-AKA authentication enables TSP to quickly and easily benefit from the carrier offload offered by the evolved PM-WANI architecture. The evolved architecture needs to give TSPs confidence that their customers will receive an exceptional experience when seamlessly authenticated, especially when there may be overlapping cellular coverage.

Question 19

What regulatory or fiscal incentives, schemes or programs may be required in the provisioning of bandwidth and backhaul for Public Wi-Fi networks? Please provide your response in detail with justification.

No specific WBA response.

Incentivising Private Entities

Question 20

What measures can be adopted to incentivise private enterprises, commercial establishments, shop owners, community institutions etc. to install public Wi-Fi hotspots? Please provide your response in detail with justification.

WBA Position:

The barrier for private operators is not awareness — it is economics and complexity. Enhancing the PM-WANI architecture to enable new hub provider models removes the complexity barrier from private enterprise adoption.

Question 21

Is there a need to strengthen the role of public or private entities as system integrators for the deployment of Public Wi-Fi networks? If yes, what policy or institutional support may be required? Please provide your response in detail with justification.

WBA Position:

Yes — the PDOA-as-system-integrator model is the key to scalable PM-WANI deployment. PDOAs should be repositioned as Hub Providers, transforming from billing aggregators to full-service technical partners, enabling them to offload hotspot specific functionality from the private enterprises deploying PM-WANI. TRAI can provide a formal PDOA hub provider certification programme with standards aligned with industry best practice.

Technical Architecture, Authentication, and Interoperability

Question 22

Are users facing challenges in the authorization and authentication procedures for accessing Public Wi-Fi Networks? If yes, how can authorization and authentication processes be simplified while ensuring security and compliance? Please provide your response in detail with justification.

WBA Position:

The lack of automatic network selection and seamless authentication creates friction that degrades the existing user experience. WBA OpenRoaming has demonstrated the benefits of a switch to a Passpoint-based approach that provides stronger security, better scalability and improved privacy compared to current captive portal models. Adopting Passpoint enables mobile applications to be used to provide the necessary level of assurance around user account identification, meaning that a single operation is performed once, after which the user's device will seamlessly search for Passpoint-enabled networks that match its subscription profile. No app per session. No One Time Passwords. Just seamless and secure connectivity.

Question 23

Is there a need for a centralized platform for authentication and payment systems in the Public Wi-Fi ecosystem? If yes, which entity is best suited for its implementation and management? Please provide your response in detail with justification.

WBA Position:

The architecture should enable centralized interoperability functions for authentication, roaming coordination, and payment settlement within the PM-WANI ecosystem. In particular, a neutral and interoperable "broker" or super-aggregator framework could help address the current fragmentation across PDOs and PDOAs, while improving user experience and operational scalability.

While centralized interoperability functions can improve access simplicity and performance consistency, the framework should avoid creating unnecessary operational complexity or excessive dependence on a single centralized operator. Instead, TRAI may consider encouraging a federated implementation model involving local authorities, municipalities, smart-city operators, transportation authorities, or other public infrastructure entities operating as regional or local aggregation bodies under nationally harmonized interoperability frameworks. A national-level interoperability standards combined with local implementation and multi vendors operation could provide an appropriate balance between scalability, implementation complexity and operational efficiency.

Once the super-aggregator is established, India's PM-WANI users can automatically roam onto federated-enabled networks globally — and inbound international visitors with OpenRoaming credentials gain automatic access to PM-WANI networks.

Question 24

What steps are required to achieve interoperability and seamless roaming among Public Wi-Fi networks? Should inter-hotspot roaming be made mandatory, and if yes, should a "super-aggregator" need to be introduced to facilitate it? Please provide your response in detail with justification.

WBA Position:

Yes to both. A roaming federation has no value unless it is universal. If roaming is optional, users encounter a mix of captive portal networks and seamless roaming networks — the user experience benefit is destroyed. A super aggregator model facilitates the integration of the Indian PM-WANI into international roaming federations.

Monetisation and Sustainability

Question 25

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.

WBA Position:

No single model applies across all contexts. The OpenRoaming RCOI type (settlement-free or settled) demonstrates how a converged Passpoint-based architecture can be used to simultaneously support different commercial models, with the revenue model being chosen based on venue economics. The integration of polices that enable immutable user-identifiers to be exchanged are defined to support innovative venue-centric propositions. Integration of venue-URL allows hotspots to advertise their services to users in an unobstructive way that does not degrade the overall user experience.

Question 26

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.

WBA Position:

WBA would welcome the opportunity to work with TRAI in defining how to accelerate and de-risk implementations. WBA would like to share its experience working with other government entities on similar initiatives world-wide. WBA would welcome discussion of approaches whereby India has a direct voice into the evolution of the OpenRoaming technical standard and its governance, as well as how to establish the required framework for WBA member companies to drive the deployment of public Wi-Fi infrastructure across the country. WBA stands ready to work with TRAI, DoT, C-DoT, and India's operators to make this happen.

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