Speedtest Certified Framework Proposal for **Telecom Regulatory Authority of India (TRAI),** India

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1. Executive Summary

Connectivity is the new utility. Just as buildings are certified for sustainability (LEED), there is a growing demand for digital connectivity standards that ensure buildings provide reliable, high-performance, and secure networks. Tenants prioritize high-speed, reliable internet, and property owners risk financial loss if they don't invest in network infrastructure. Cybersecurity threats are increasing, and corporate tenants demand certified secure networks for compliance and risk mitigation. **To address these new industry needs, Ookla is introducing Speedtest Certified™ in 2025.**

Ookla, a global leader in network intelligence, proposes a strategic partnership with the Telecom Regulatory Authority of India (TRAI) to support the successful execution of the Digital Connectivity Rating framework. Through our Speedtest Certified™ program and associated technologies, we bring globally validated, regulator-trusted tools to assess and certify connectivity performance at the property level.

Our framework offers a comprehensive, data-driven solution that directly aligns with TRAI's regulatory priorities of transparency, standardization, and consumer empowerment.

Key Contributions to TRAI's Framework:

- Real-time & Historical Performance Validation: Support longitudinal network quality assessment using crowdsourced and app-based Speedtest data.
- Standardization Across Agencies: Enable a consistent methodology through accredited partner training, ensuring uniform evaluation by all DCRAs.
- Wi-Fi Infrastructure Surveying: Propose mandatory per-floor Wi-Fi heatmaps generated through spectrum analysis for visibility into access point coverage and interference.
- Seamless Tool Integration for TRAI: Provide TRAI access to audit-friendly tools and digital dashboards for post-verification and oversight.
- Mapping Rural Connectivity: Leverage geospatial intelligence to assess digital connectivity down to the village level (LGC granularity), aligned with upcoming Rural Index goals.

We believe that integrating our methodology into the DCRA process can substantially elevate the transparency and credibility of property-level connectivity ratings, while reducing variability and operational overhead for regulators and agencies alike.

We welcome the opportunity to present this in further detail and collaborate closely with TRAI in achieving its mission of a digitally connected India.

Speedtest Certified ™

Because connectivity is now essential, and our digital lives are mainly indoors, there's a big need for standards and verification in buildings. Property owners, developers, and businesses want better digital infrastructure. As real estate developers, commercial landlords, and corporate tenants prioritize smart buildings, digital connectivity, and cybersecurity, there is a growing demand for network performance certification to validate and optimize a building's digital infrastructure. Examples include commercial office buildings, retail locations, smart campuses, and other types of real estate.

By delivering comprehensive, real-world validation through multi-source data collection and continuous performance monitoring, Speedtest Certified reveals the complete connectivity picture across all critical performance indicators. Leveraging our trusted authority in network measurement, Speedtest Certified creates significant value throughout the ecosystem—enabling property differentiation, validating network investments, enhancing service provider offerings, and ensuring superior digital experiences for every user.

Speedtest Certified not only presents a private sector opportunity for network owners, commercial real estate developers, and technology partners, but also presents a public opportunity to walk hand in hand with regulators in developing standards for connectivity. We see a strong alignment between TRAI's ambition to standardize and improve in-building digital connectivity for the citizens of India and the core mission of Speedtest Certified.

Our overarching goal is to collaborate closely with TRAI to enhance the digital connectivity landscape across India, ensuring a transparent, standardized, and fair approach to assessment. Speedtest Certified can support the DCRA's role by providing a proven framework for network assessment, leveraging Speedtest's industry-leading reputation and methodology for indisputable validation of network quality.

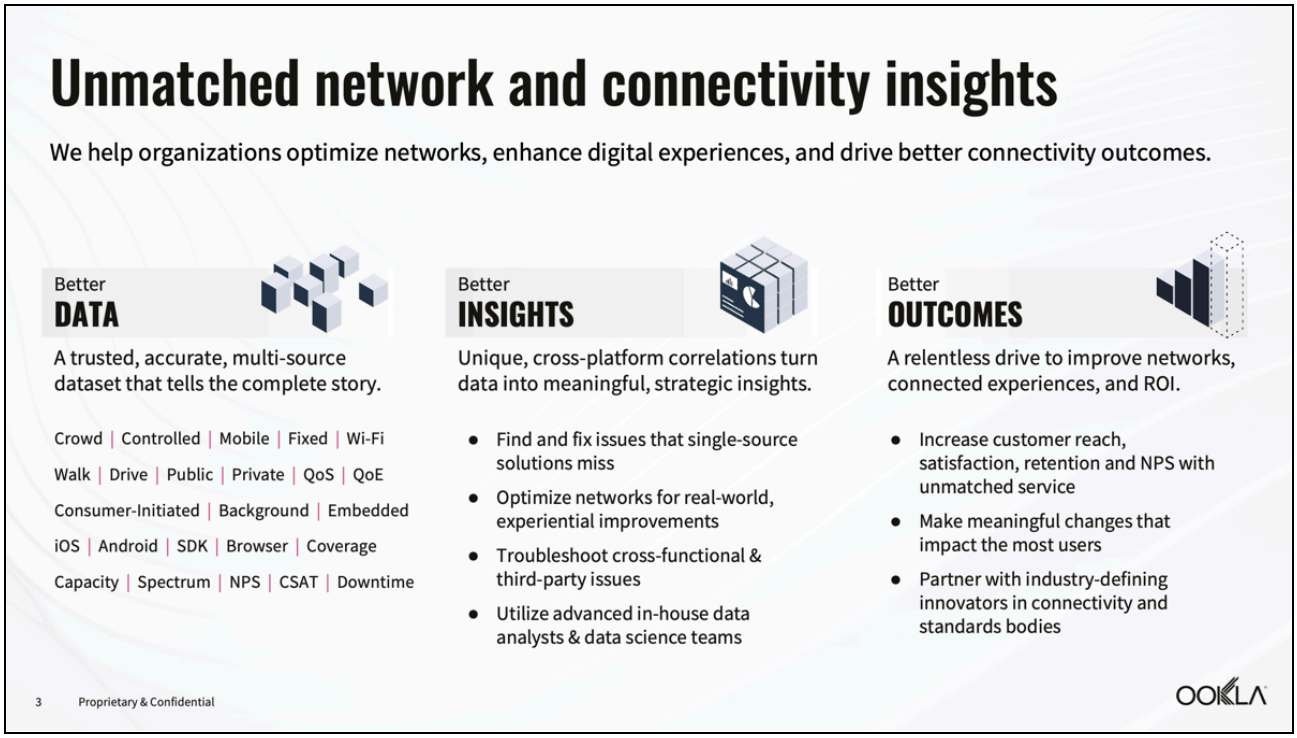
A Trusted Partner for Regulators

Ookla® is a global leader in connectivity intelligence that provides consumers, businesses, and other organizations with data-driven insights to improve networks and connected experiences with crowdsourced enterprise solutions. Our mission includes providing unbiased, accurate, and transparent data on the state of internet performance to consumers, the telecommunications industry, and government bodies.

Ookla, a global leader in connectivity intelligence, brings together the expertise of Speedtest®, Downdetector ®, Ekahau®, and Speedtest Drive™ to deliver unmatched network insights. By combining multi-source data with industry-leading expertise, we transform network performance metrics into strategic, actionable insights. Our solutions empower the organizations that supply connectivity with essential information to help them shape and optimize their networks. We give voice to the real-world experiences of people and systems that rely on those networks every day.

By providing a view into real-world consumer network experience across the world, Ookla empowers the organizations that research, design, and supply connectivity with actionable insights to help them shape and optimize networks.

Bringing together millions of daily consumer-initiated Speedtest results and billions of daily QoE samples across hundreds of millions of unique devices, our unmatched network intelligence and connectivity insights help organizations optimize networks, enhance digital experiences, and drive better connectivity outcomes.



This document is prepared for TRAI following our engagement with TRAI, and supporting Digital Connectivity Agency Rating Assessment Manual released, Ookla provides their keen interest in proposing Speedtest solutions to TRAI to support the regulation, and suggestions of methodology supported around the world. We aim to support TRAI in formulating policy or regulation in improving connected experience.

With objective in mind, Ookla is proposing the following solution:

Speedtest Certified™ - the definitive property network verification program powered by the trusted testing methodology and unrivaled brand recognition of Speedtest®. By delivering comprehensive, real-world validation through multi-source data collection and continuous performance monitoring, Speedtest Certified reveals the complete connectivity picture across all critical performance indicators.

2. How Speedtest Certified Works

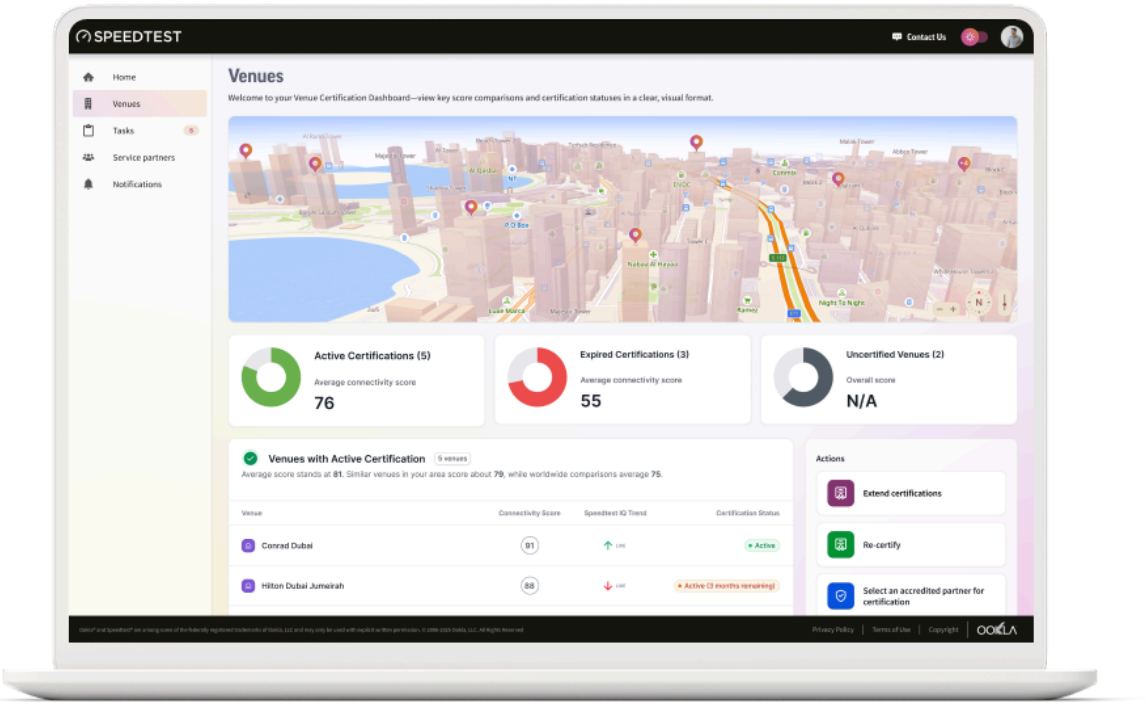
Ookla's Speedtest Certified™ provides a rigorous, data-driven evaluation of a venue's connectivity network, helping to determine whether it meets the performance, reliability, security and business objectives of both network and venue owners and users alike. Speedtest Certified™ introduces a new industry benchmark for measuring real-world connectivity and security performance across commercial and enterprise properties.

Speedtest Certified addresses the needs and interests of different stakeholders in the ecosystem. For End-Users, it means a better connectivity experience, consistent performance, and confidence in digital services. Regulators gain improved visibility into digital infrastructure, data for policy making, and trusted third-party data. Accredited Partners benefit from premium service pricing, recurring revenue, competitive differentiation, enhanced customer relationships, and co-branding opportunities. Real Estate and Network Owners achieve verified network readiness for digital services, better rental values, objective metrics, standardized quality benchmarks, and alignment with business outcomes.

The building blocks of Speedtest Certified™ include:

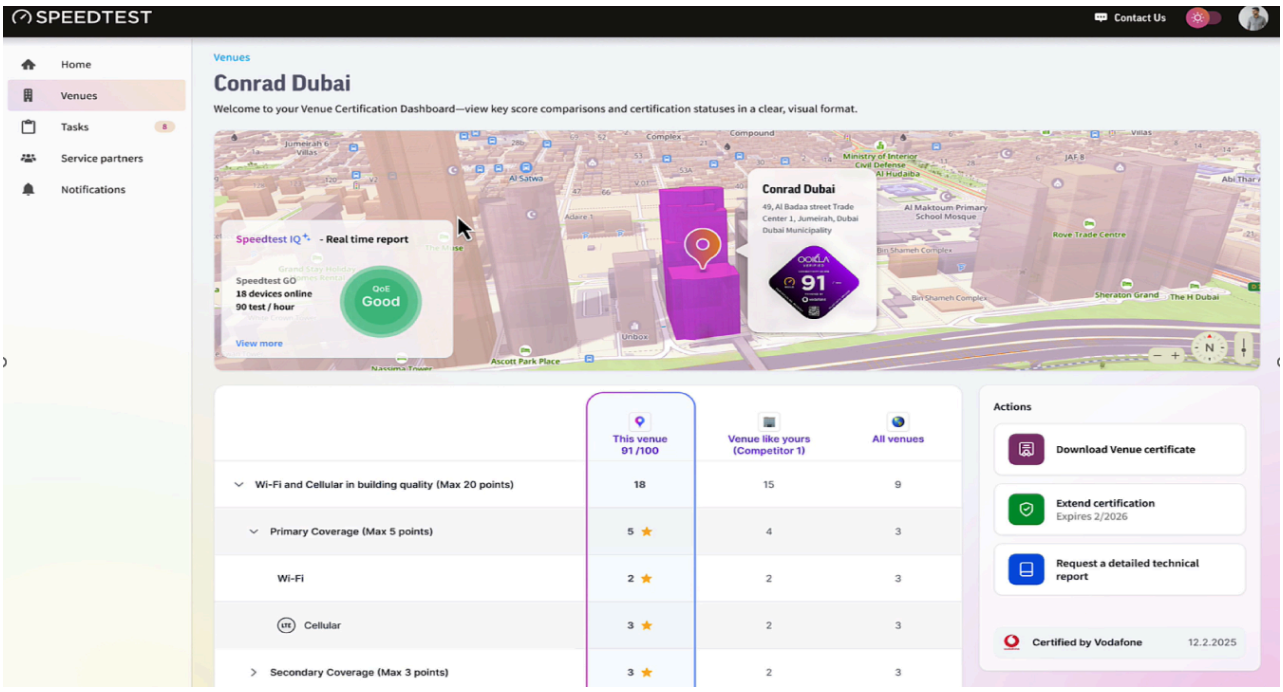
- **Speedtest Certified Digital Hub:** Provides personalized insights, network recommendations, and benchmarking against other certified networks.
- **Accredited Partner Program:** Training and accreditation for partners to extend and apply Speedtest Certifications.
- **Ookla Trusted Methodology & Scoring:** A unique, data-driven methodology leveraging comprehensive datasets.
- **High-Value Certification:** An officially recognized certification that improves visibility and user confidence and visibility.

Speedtest Certified™ delivers AI-based insights and recommendations to stakeholders via a Digital Hub, including accredited partners, building/network owners and regulatory authorities. The Speedtest Certified Digital Hub is a portal which will be a centralized platform for both accredited partners and end customers to streamline the certification process, reporting, and insights. The portal will provide a customized experience depending on the user's role, ensuring seamless navigation, data access, and actionable insights. The Speedtest Certified platform provides building owners, accredited partners, and regulatory agencies to efficiently submit assessments, understand results, insights and recommendations, access certificates and stay up-to-date with the latest certifications standards.



The portal allows certification assessments to be uploaded to be included into an automated scoring calculator based on a pre-defined and published methodology. It also provides a real-time preview of a building's projected SpeedScore based on entered test results. The provided dashboard will provide insights and summarized information from collected and analyzed data from sources such as Speedtest data, RootMetrics results, and Ekahau Wi-Fi surveys for seamless reporting.

The portal will be able to provide a comparative view of venues across industries and regions to help stakeholders understand their posture compared to similar venues. A representative conceptual example is included below.



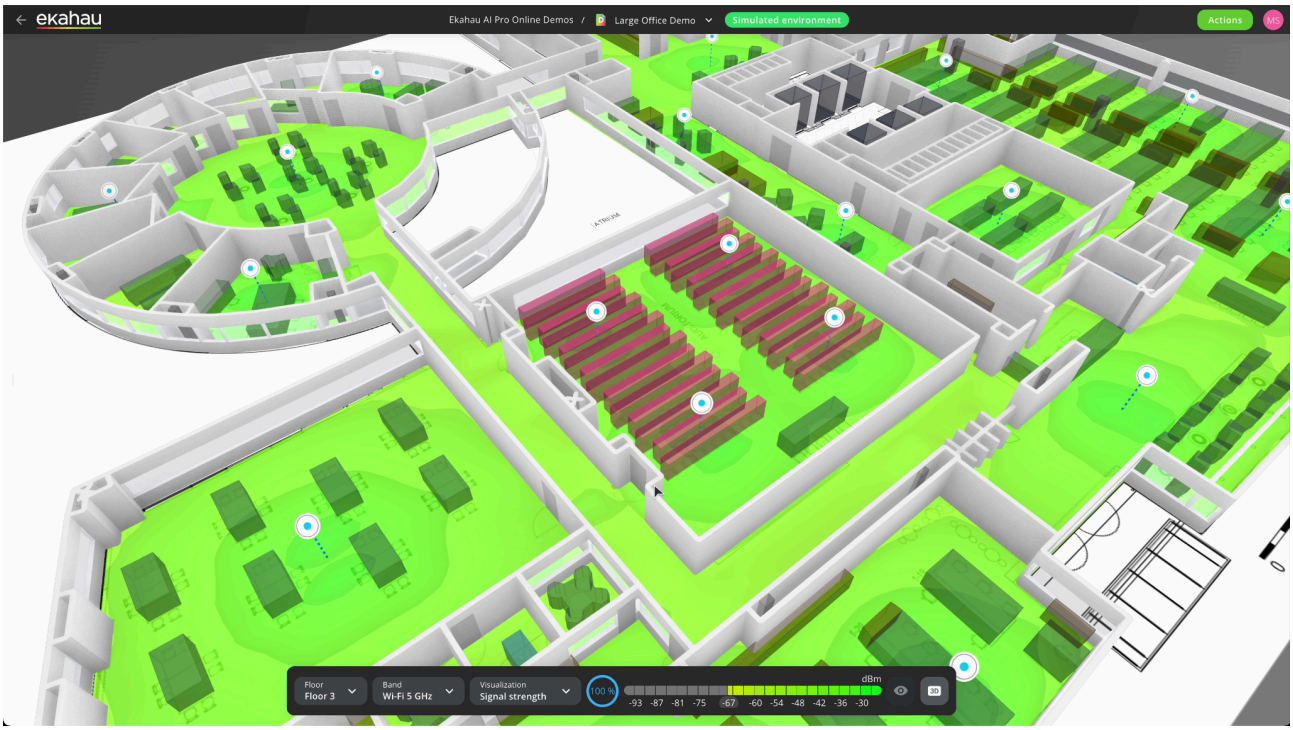
Accredited Speedtest Certified partners will be able to track their certification status through this digital hub and access exclusive partner resources. Lastly, partners and venue owners will be able to view and access official copies of their certificates via the digital hub.

Speedtest Certified™ uses a defined data collection methodology, the measurement process, and the resulting data points that inform assessments across locations and use cases. The certification leverages existing tools and methodologies from Ookla's portfolio to deliver objective, real-world performance evaluations. The certification provides an independent evaluation of a venue's performance based on a defined set of best practices against assessed metrics . The assessment primarily uses data from Ookla's existing tools and methodologies, combined with additional sources of insights. Speedtest Certified takes a comprehensive and data-driven approach to performance-based evaluation, leveraging a variety of data spanning public and private sources including, but not limited to:

- **Ookla's Speedtest:** Validate real-world network performance within a building. By leveraging dedicated testing and billions of crowdsourced test results, Speedtest provides granular insights into download and upload speeds, latency, jitter, and packet loss across different ISPs, mobile carriers, and Wi-Fi networks. This data is used to benchmark a property's connectivity against local and national averages. Additionally, Speedtest data helps identify network congestion patterns, peak-hour performance fluctuations, and coverage inconsistencies, which are key factors in determining certification scores and areas for improvement.
- **Speedtest Drive:** Employs walk-tested cellular performance to further assess in building cellular

coverage and performance.

- **Speedtest Go:** Speedtest Go can be considered for fixed benchmarking stations in public venues or rural clusters to ensure ongoing longitudinal performance monitoring aligned with the Rural Connectivity Index.
- **Ekahau:** Ookla's leading enterprise Wi-Fi performance analysis solution to measure coverage, capacity and network quality, ensuring that the Wi-Fi network within the building meets the demands of high-density usage and delivers consistent performance. This data allows detailed floor plans to be created and/or used to map buildings and use precise location information from survey data.



Wi-Fi Network Performance Visualized in Ekahau AI Pro Online

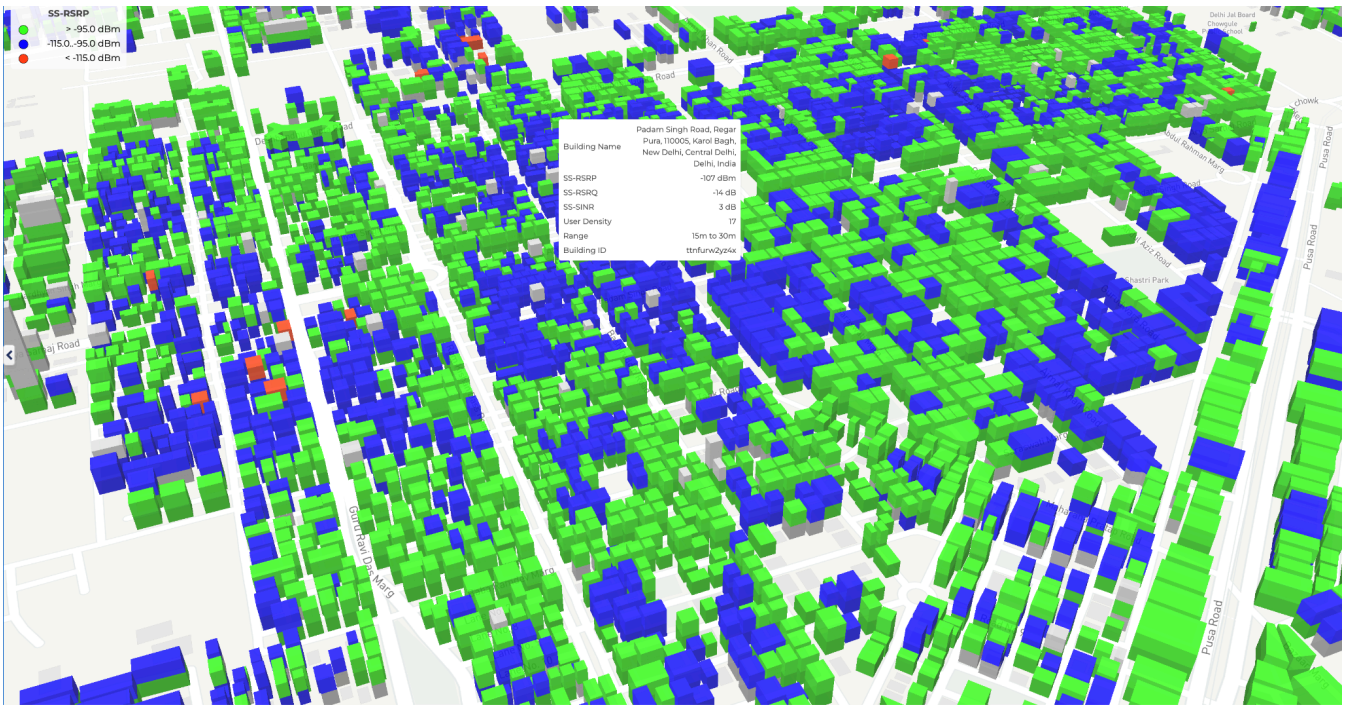
- **Cell Analytics:** Cell Analytics is a powerful, intuitive platform that delivers deep insights into wireless service quality, RF performance, data usage, user density, and cell site locations. Built on billions of daily crowdsourced samples, it enables operators to assess network performance, identify issues, and uncover opportunities for optimization and expansion. Users can view network conditions both outdoors and indoors — including by floor height in tall buildings — to pinpoint coverage gaps and prioritize engineering and marketing efforts. The platform includes indoor analytics powered by a proprietary Indoor Confidence Level (ICL), offering building-level 2D views of RF conditions, user density, and customer experience. Data usage analytics are available for mobile, Wi-Fi, or combined usage, viewable by operator or across all operators, with detailed gradient and 10-meter binned

views.

Mobile Network Performance in 2D and 3D Visualized in Cell Analytics

The Cell Analytics portal boasts a substantial database of over 3 million buildings, providing a rich foundation for detailed mobile performance analysis. This extensive repository allows users to readily examine mobile performance characteristics in various contexts, including indoor-only environments, outdoor-only settings,

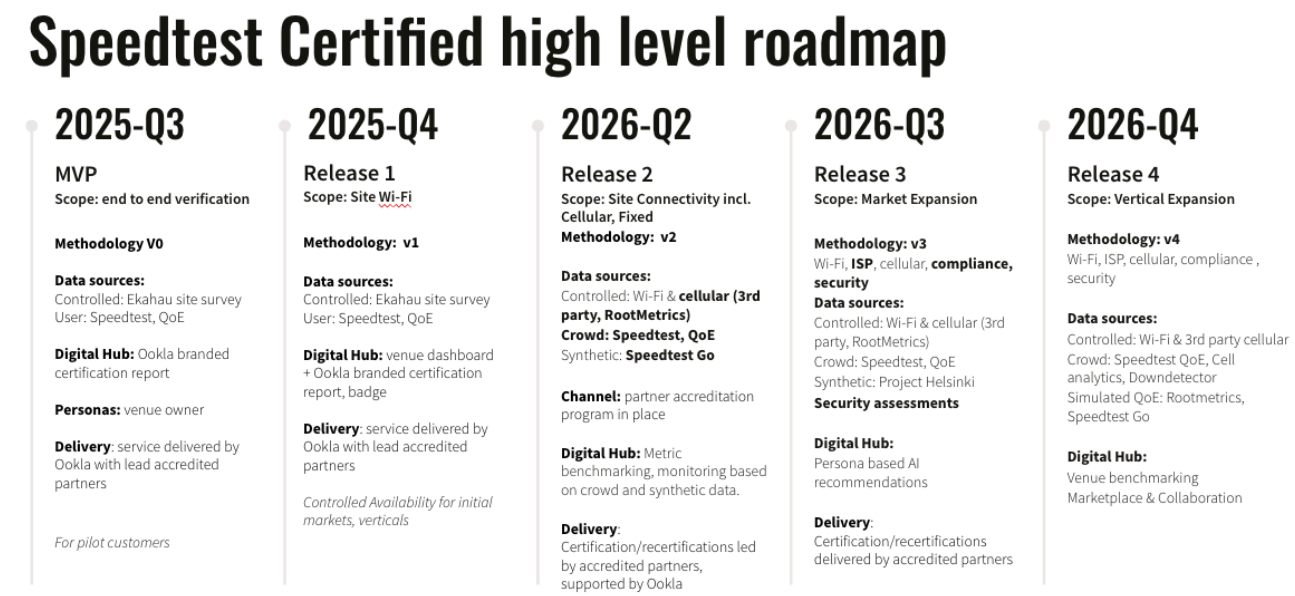
and even specific floors within buildings. The depth and breadth of this data enable granular and nuanced assessments of mobile network behavior across diverse spatial conditions.



Mobile Network Performance in 3D, for Delhi, India visualized in Cell Analytics

By integrating these diverse data sources and assessment methodologies, Speedtest Certified provides a holistic and reliable certification that guarantees certified buildings deliver consistent, high-performance connectivity that can be depended upon by tenants, employees, and a multitude of IoT devices.

While the long-term goal of Speedtest Certified™ is to assess a venue performance across various access technologies, Release 1 focuses on the venue's enterprise Wi-Fi deployment. Unlike mobile or fixed-line connectivity—where networks are often generic—enterprise Wi-Fi networks are typically custom-designed to meet the specific needs of different industry verticals. This creates a need for vertical or segment-specific scoring systems that will evolve as part of the certification methodology. Release 1 will provide a single scoring system with vertical or segment-specific weightings will be defined and published. This ensures consistency in methodology while allowing for tailored evaluation aligned with industry-specific requirements. Subsequent releases will expand the methodology to include additional technologies such as cellular connectivity.



Ookla believes Speedtest Certified™ is strongly aligned to the vision and direction outlined in TRAI's draft for Assessment of Digital Connectivity under Ratings of Properties for Digital Connectivity Regulations. Ookla welcomes the opportunity to collaborate with TRAI, and would be eager to work with TRAI to prioritize and adjust the roadmap to ensure that Speedtest Certified™ addresses the needs of both TRAI and the global market.

We believe Speedtest Certified can be a valuable partner in operationalizing the robust framework TRAI has developed. As we develop Speedtest Certified, we are creating 'built-for-purpose' methodologies designed to meet diverse global needs for network verification, and can work together with TRAI in ensuring their requirements are met. While Speedtest Certified is built upon a globally trusted testing methodology, we can adapt and align a separate certification methodology to specifically certify against the comprehensive parameters outlined in TRAI's 'Draft Manual for Assessment of Digital Connectivity.'

3. Assessment Questions / Suggestions to TRAI DCRA Framework

The following table outlines suggested assessment questions for select sub-criteria under the TRAI Digital Connectivity Rating framework. The questions are designed to encourage transparent, consistent, and audit-friendly evaluation while addressing the importance of longitudinal performance data and methodological standardization across DCRAs.

Criterion No.	Sub-Criterion	Assessment Question	Evidence Required	Remarks / Observations
4.7.1	Number of Wired ISPs integrated at the property	How many distinct licensed wired Internet Service Providers (ISPs) are actively integrated and providing service within the property's infrastructure?	1. List of ISPs active at the premises (with license info) 2. Signed service provisioning agreements 3. Proof of service activation such as customer onboarding documents or live subscriber count	While evaluating ISP availability, agencies must ensure the ISPs have physically deployed infrastructure and are capable of delivering active service to end-users. Properties with exclusive access arrangements should be marked accordingly. Suggest TRAI to maintain a centralized registry of qualified ISPs for rating use.

4.7.2	Number of Mobile Network Operators (MNOs)	How many licensed mobile network operators (MNOs) provide reliable indoor signal coverage throughout the property using their respective spectrum bands (2G/4G/5G)? The assessment should reflect true indoor availability as experienced by end-users.	1. Indoor signal strength and quality measurements (e.g., RSRP/SINR) for each MNO 2. Floor-wise device-based tests using standardized tools 3. Annotated heatmaps showing coverage zones per operator	To ensure consistency across DCRAs, TRAI is advised to define a standard methodology and/or test tool. Disparities in tool usage (e.g., phone logs, RF software, drive test kits) can lead to inconsistent evaluations. We recommend baseline indoor signal validation using structured apps or software, and submission of operator-specific heatmaps. Where possible, assessment should verify signal availability across multiple device types and building zones.

4.8.1 + 4.8.3	Mobile Network Coverage and Performance	Does the property provide reliable and high-quality mobile connectivity across public and non-public areas for all licensed MNOs?	1. Mobile performance test results (min. 3 test points per floor) 2. Coverage heatmaps (RSRP/SINR) 3. Results across multiple time intervals and/or devices 4. Optional: crowdsourced historical performance for comparison	Single-time walk or drive tests may not reflect actual user experience due to time variability. Recommend requiring: • Use of standard test apps • Submission of performance trends over at least 7–14 days • Archived test logs that TRAI or third party can audit. Encourage DCRAs to validate with historic data from standardized sources to reflect consistency.

4.8.2 + 4.8.4	ISP Network Coverage and Performance (Wi-Fi, LAN)	Does the wired/wireless broadband network within the property deliver high-quality, consistent performance to end-users in public and private spaces?	1. Speed and latency results from controlled tests (e.g., app-based tools) 2. Wi-Fi coverage maps per floor (if applicable) 3. Device logs or dashboards 4. Historical trend reports or issue logs over time	Propose use of structured and repeatable Wi-Fi diagnostic tools that map actual user experience. DCRA should perform tests over different times of day and/or multiple days. Suggest enabling submission of network usage and issue trend data over the last 15–30 days for contextual accuracy.
4.8.5	Average Download Speed of Providers (Top Plan)	What is the average download speed (in Mbps) experienced on the highest-speed plan available in the property from each wired ISP and Wi-Fi network?	1. Results from performance tests at peak and off-peak hours 2. Plan specification from ISP 3. App-based download tests across 2+ devices 4. Average speed from historical app/crowdsourced data over last 30 days	Propose DCRA be required to test against both advertised plan and real performance. Recommend using tools that generate consistent, full-speed tests. Suggest submission of historical speed data to detect inconsistencies and avoid selective optimization

				during assessment period.

Additional Recommendation to TRAI:

1. TRAI should mandate a uniform methodology and testing protocol across all accredited DCRAs to ensure consistency and transparency.
2. Assessment scores should incorporate network performance trends over a rolling 7–30 day period before and after physical site visits.
3. Allow integration of standardized crowdsourced performance datasets to validate and audit reported performance results.
4. Require DCRAs to use tools with digital reporting and accessible audit trails for validation by TRAI or third-party oversight bodies.

Additional Recommendations on Wi-Fi Infrastructure Assessment:

For seamless connectivity on wireline networks, a robust in-building Wi-Fi infrastructure is foundational. To ensure accurate evaluation of Wi-Fi robustness and user experience, a dedicated Wi-Fi survey should be mandated as part of the assessment process. The survey should be conducted using a Wi-Fi spectrum analyzer capable of capturing:

- All available SSIDs and their configurations
- Wi-Fi standards in use (e.g., 802.11n/ac/ax)
- Operating frequency bands (2.4 GHz, 5 GHz, 6 GHz if applicable)
- Channel utilization and interference levels
- Signal strength (RSSI) and signal quality

These parameters are critical for understanding potential performance issues related to contention, signal degradation, or insufficient access point deployment.

As part of evidence submission, a coverage heatmap should be generated for each deployed Wi-Fi technology and frequency band, highlighting strong, weak, and dead zones within the property. This will provide a visual and data-backed representation of Wi-Fi network coverage and quality, supporting a more complete assessment of user connectivity experience.

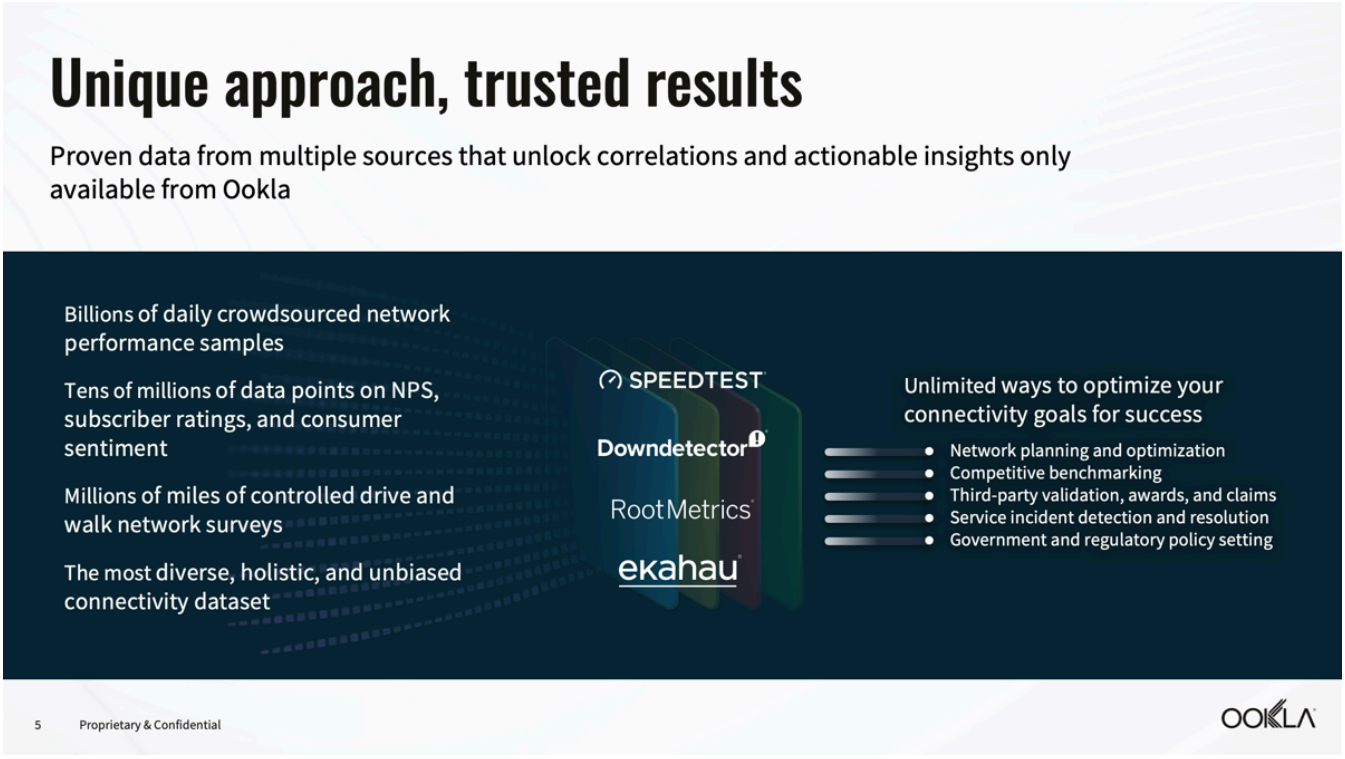
4. Ookla's Mission

Ookla is part of Ziff Davis, the digital media subsidiary of Ziff Davis. (NASDAQ:ZD), a New York-based internet information and services company. Ookla is the global leader in mobile and fixed broadband network intelligence, testing applications, and related technologies.

Ookla's core mission includes providing unbiased, accurate, transparent, and independent data on the state of the internet to three distinct constituencies: consumers, the telecommunications industry, and governments and industry associations. Consumers make informed choices when they have accurate information on the quality and performance of their internet connections.

The telecommunication industry relies on Ookla's benchmarking analytics to optimize and improve their networks and better position their services to consumers. The industry also leverages the excellent reputation of Ookla's data to validate claims used in marketing campaigns.

Ookla's data collection philosophy demands strict adherence to protecting the privacy of the users of Speedtest and other applications. Consumer-sourced datasets we license rely only on Ookla-branded products for collecting performance and coverage measurements.



4.1. Independent and Trusted

Ookla has become the trusted source for benchmarking and validating network performance worldwide. In respect to this, the following points are key to understanding Ookla's market position:

- Ookla's methodology is globally recognized and accepted as a standard way to measure speed performance. Hence, Ookla is adopted by more than 400 enterprise clients worldwide.
- App testing methodology is designed to represent real user experience and our test platform has access to more than 16,000+ servers worldwide and more than 1500+ servers in India.
- Ookla is fully GDPR compliant and transparent in its data collection methodologies.
- Ookla applies rigorous data science and filtering to ensure the analyzed results are an accurate and true reflection of real-world performance.
- As an independent third party, Ookla is able to provide validated endorsements of network performance. Ookla does this in more than 80 countries, substantiating marketing claims for more than 120 operators.

4.2. Customer References

Ookla enjoys long-standing client relationships with internet service providers (ISPs), mobile network operators, regulators, and other enterprises in over one hundred (100) countries, including large multinational group telecommunications operators, content providers, device manufacturers, and operators serving small and large nations alike. Additionally, Ekahau by Ookla is trusted by 90% of Fortune 500 companies, to ensure maximum Wi-Fi network performance, security, and ROI.

International Telephone Union (ITU) Study and Expert Group partnerships
As official members of the ITU, Ookla partners with leading global operators, test and measurement companies, infrastructure and hardware providers, network analytics providers, and regulators to help develop and define policies, access technologies, and quality standards.

ITU-T (Study Group 12)
SG12 is the expert group responsible for the development of international standards on performance, quality of service (QoS), and quality of experience (QoE).

ITU-D (Expert Group 1 & 5G Indicators Sub-Group)
SG1 works on providing an enabling environment for the development of telecommunications/ICTs, such as policies and access technologies for broadband, cloud computing, accessibility for persons with disabilities and specific needs, and consumer protection.

Our data has been used in ITU publications such as the Measuring the Information Society Report: https://www.itu.int/pub/D-IND-ICTOI-2018

GSMA partnership

Ookla has a data and content partnership with GSMA Intelligence. GSMA Intelligence is the research and publication wing of the GSMA. Ookla is the exclusive provider of global network performance data to the GSMAi. Examples of content produced using our data are:

GSMA Connected Society - The State of Mobile Internet Connectivity
The State of Mobile Internet Connectivity 2019 | GSMA

The Mobile Economy
The Mobile Economy 2025

The Development Data Partnership

Ookla works with the Development Data Partnership on projects with real stakeholders across the globe. The relationship is project based with World Bank, Inter-American Development Bank (IDB), International Monetary Fund (IMF), and Organization for Economic Co-operation and Development (OECD) researchers around the world having access to Ookla Intelligence data on a per project basis. These projects range from telecommunication to societal development, to event tracking and projection. These projects are a mixture of academic, private governmental delivery, and publication.

Here are some examples of projects which have been assisted by Ookla:

- Broadband mapping and planning for a five-year strategy for a large Eastern European country.
- Tracking internet patterns during the Covid pandemic in Southeast Asia
- Looking at West African internet transformation
- Improving broadband accessibility to close the rural-urban divide.
- The role of digital infrastructure in Central and South American countries
- Digital economy assessment in North Africa
- Digitalization and resilience in Sub-Saharan Africa
- Tracking global movement to work from home during the pandemic.

Here is a small sampling of Ookla's global CSP, vendor, and regulator clientele:

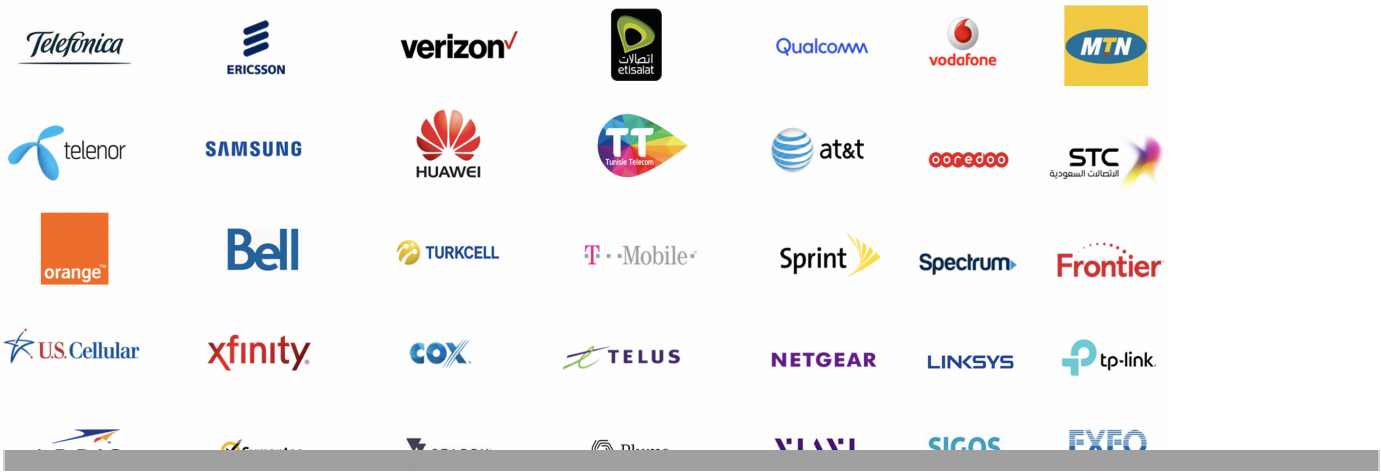


Figure 2-1 Ookla's worldwide client

Figure 2-2 Ookla's regulator's client

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