

TELECOM REGULATORY AUTHORITY OF INDIA

5G readiness tested under TRAI Pilots at Bhopal Smart City, GMR International Airport New Delhi, Deendayal Port Kandla and Namma Metro Bengaluru for Small Cells deployed using street furniture

New Delhi 25th July 2022: Telecom Regulatory Authority of India (TRAI) had initiated pilots at Bhopal Smart City, GMR International Airport New Delhi, Deendayal Port Kandla and Namma Metro Bengaluru on use of street furniture for Small Cells and aerial fibre deployment. Major Telecom Service Providers and Infrastructure Providers like Bharti Airtel, Reliance Jio, VodafoneIdea and BSNL are participating in these Pilots at different locations. These pilots will be very helpful to make cross sectoral infrastructure more accessible for quick roll out of the 5G networks for Telcos, post allotment of 5G frequencies by DoT. 5G spectrum auction is scheduled to start from 26th July.

In Bhopal Smart City, the Project was carried out at eleven locations. With radiation and testing of 5G small cells by Telecom Service Providers under the pilot, Smart City Bhopal has become the first smart city in the country to test 5G readiness for use of street furniture like Traffic signal pole, Street light pole, Smart Pole, Billboard, Direction Board, Road Signage, Foot over bridge and city Bus Shelter. The Pilot involved coordination, administrative permissions, authorisation to use and other support from various entities like MP State Government, Bhopal Municipal corporation, District Collector office, Bhopal Smart City, Bhopal Police, Bhopal City link Ltd (Bus city service), DISCOM, Advertising agency and other state Government bodies. The Pilot, thus showcase co-creation and co-sharing of infrastructure involving multiple sectors as per the spirit of PM GatiShakti initiative.

Similarly with deployment of 5G Small Cells over street furniture by Telecom service providers under TRAI pilot, Deendayal Port Kandla and GMR International Airport New Delhi have become the first port and airport respectively in the country to test 5G readiness. At Namma Metro Bengaluru, MG Road Metro station was selected as main station to target 5G coverage at road level, in its Concourse area, platform and tracks on both sides. After radiation of 5G Outdoor Small Cells at the station, Namma Metro has become the first Metro rail system in India to test 5G readiness.

For each Pilot, a working group has been constituted by TRAI. Significant progress has been achieved in the Pilots in a short time with the active support from working groups included officers from TRAI Regional Offices, BMRCL, Deendayal Port Authority, Bhopal Smart City, GMR, Ministry of Housing & Urban Affairs, Department of Telecommunications, Telecom Service Providers (TSP) and Infrastructure Providers.

Small cells are low-powered radio access nodes or base stations (BS) that have a coverage range from a few meters up to a few hundred meters. The attributes of small cells (radio, antenna) are compressed such that they are portable and easy to deploy. As India plans to launch 5G, small cells can play a pivotal role in network upgradation and expansion. With the increased uptake of smartphones and the associated insatiable demand for digital services, average traffic consumption per user has increased considerably. For 5G, higher frequency bands will be used to achieve high speed data downloads. However, use of higher frequency bands for 5G rollout will have the shorter coverage as signals in these bands cannot travel through buildings or obstacles. The lower cell radii for the proposed 5G higher frequency bands will force the need for densification of the network using a large number of small cells. Accordingly, 'Making India 5G Ready' report prepared by the 5G High-Level forum constituted by Department of Telecom (DoT) mentioned that *"5G will require massive addition of both above and below the ground*

infrastructure, both in passive and active categories. These include backhaul radios, antennas, towers, street furniture, and ducts, etc. In the long term, 5G infrastructure densification can exceed 1,000 Base Stations per Sq. Km." Therefore, the use of higher frequency bands for 5G services would require that macro cells be complemented with extensive deployment of small cells so as to support all kinds of uses and applications, at all locations.

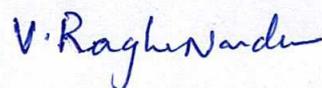
Even in cases where coverage is not an issue, small cells can be used for traffic offloading since the carrying capacity of lower frequencies, used by macro radio sites, are limited. Over the period, further densification of cells will be required to cater to capacity requirements. Considering the lower maintenance cost of small cells, ease of configuration and other benefits that they bring, small cell deployments are likely to grow. The deployment of small cells can thus play a prominent role in the rollout of 5G networks by acting as an economically feasible and sustainable solution to expand network coverage.

Hundreds of 5G Small Cells are needed to be installed in a square KM of area to provide good coverage. Use of Street furniture already available at these places like poles etc. can be used for mounting these 5G Small Cells, obviating the need for erecting thousands of new towers. This will not only ensure faster deployment of 5G but also unlock true potential of underutilized street furniture at these critical places. Availability of existing street furniture in form of millions of streetlights, thousands of bus stops, hundreds of metro pillars can be a boon for economical and fast deployment of small cells. Considering the costs involved, complexity, and time frames for densification of the proposed 5G network infrastructure, there is a need to put in place a mechanism for using the existing street resources for large-scale deployment of small cells.

The deployment of small cells and aerial fibre on street furniture were likely to face many issues like identifying the suitable street furniture based on availability of backhaul, power, capabilities of street furniture for mounting

suitable equipment, scalability, and concerns related to local approval, and safety. The right of way procedure, sharing of the street furniture amongst various users, permissions needed for power supply under state electricity laws, exemptions or bulk permissions for small cell deployment will also be required to be addressed. One of the objectives of TRAI Pilot is to develop cross sectoral framework which promotes sharing of infrastructure among various central, state, and municipal authorities to develop state of the art 5G network.

TRAI has simultaneously initiated a consultation process to seek inputs from stakeholders on these issues. Based on the consultations and learning from these pilots, TRAI is in the process of preparing its comprehensive recommendations to the Government on conducive regulatory and policy framework to ensure successful and rapid rollout of small cells and optical fiber using street furniture in all smart cities, other cities and towns, ports, airports, metro rails, Industrial parks, and estates etc. The emphasis of such recommendations is likely to be more on creating a regulatory framework which facilitates collaboration and participation among various departments, central and state agencies, local bodies, and service providers.



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