

The internet and broadband segment in India is expected to witness encouraging growth over the next few years, given the high demand for smartphones and data services. So far, the benefits of the internet and broadband revolution have mainly reached the urban population. With the aim of bridging the digital divide that continues to exist between urban and rural India, the government is now focusing on the speedy roll-out of the National Optical Fibre Network project. The project, which was envisaged in 2011, has now been renamed BharatNet.

The world's largest rural broadband connectivity project, BharatNet targets to connect around 250,000 gram panchayats through an optical fibre cable (OFC) network. It aims to provide 100 Mbps bandwidth at each gram panchayat, with the establishment of a high capacity network management system and a network operation centre. BharatNet aims to reach the bottom of the pyramid by extending the existing OFC network to the gram panchayat level. At present, the country has 1.2 million km of OFC cable network, which covers 28 per cent of the country's population, largely urban. The government aims to lay incremental fibre of around 0.6 million km under BharatNet to cover 72 per cent of the population, particularly in rural areas. One of the key features of the project is providing non-discriminatory access to the infrastructure created under BharatNet to all service providers, including state-owned operators and private operators.

BharatNet's project cost is pegged at \$4 billion. The project is also promoting the government's Make in India initiative by deploying only indigenously manufactured equipment.

BharatNet is being implemented by Bharat Broadband Network Limited (BBNL), a special purpose vehicle of the Government of India. As part of the project, BBNL has entrusted three state-owned entities – Bharat Sanchar Nigam Limited (BSNL), RailTel Limited and Power Grid Corporation of India Limited (Powergrid) – to lay fibre across the country. So far, these three organisations have succeeded in connecting around 20,000 gram panchayats across various states through OFC. For instance, 1,129 gram panchayats have been connected in Kerala on OFC, 86 in Puducherry, 12 in Chandigarh, 1,256 in Karnataka, 30 in Rajasthan, 41 in Gujarat, 15 in Tripura, and 14 in Andhra Pradesh. Through the connected gram panchayats, the government aims to widen the scope of effective and efficient citizen service delivery. Internet and broadband connectivity across gram panchayats will help drive the adoption of e-governance, e-healthcare, e-banking and e-commerce services, among others. The government aims to provide citizens easy access to critical services online. The citizen-led services to be delivered through BharatNet include access to land records, and birth and death certificates; quality education through digital literacy programmes; access to affordable health care services through online medical consultations with doctors; access to a host of banking services through online transactions; payment of utility bills; and provision of employment opportunities through BPOs and rural internet service centres. The project is also aimed at boosting the economy. The states are expected to witness a growth of 1.08 percentage points for every 10 per cent increase in the number of internet subscribers. Further, the country stands

to gain economic benefits of \$10 billion to \$45 billion upon the commissioning of BharatNet.

Given the large scale of the project, the implementing agencies have been facing several challenges related to its roll-out. These include the slow speed of execution due to the difficult geographical terrain; the limited number of executing agencies; shortage of equipment; obtaining right-of-way (RoW) permissions; and lack of industry participation. The government has taken several measures to counter these challenges. For example, the implementing agencies are exploring new technologies for digging and trenching to fast-track work in difficult terrain, and more manpower is being deployed to speed up work. The government has involved more manufacturers to ensure that gigabit-capable passive optical network equipment is available at all the gram panchayats. It has also signed RoW agreements with various states, and is promoting BharatNet as a non-discriminatory platform, providing equal access to fibre to all service providers. As a result of these efforts, the three executing agencies – BSNL, RailTel and Powergrid – have managed to complete survey and planning work across all 250,000 gram panchayats. Further, gigabit-capable passive optical network equipment has been made available to the majority of gram panchayats. So far, pipes and cables covering 73,340 km and 46,899 km respectively have been laid across the country. Further, trenching and cable-laying work has been speeded up to meet deadlines. Each day, pipes covering 350 km and OFC covering 250 km are being laid.

In order to ensure that BharatNet is a success, the government is exploring various business models to monetise the infrastructure being created under the project. It has suggested the establishment of common service centres which would be co-located with the gram panchayats, establishing Wi-Fi hotspots for providing broadband services to customers through prepaid billing, and promoting an e-commerce and digital payment ecosystem. Despite delays in meeting the project deadline, BBNL is working towards commissioning the project at the earliest, as well as ensuring that various stakeholders, including the government, citizens and private operators, are able to leverage the infrastructure provided by BharatNet, in order to realise the government's Digital India vision.

Based on a presentation by P.K. Agarwal, Director, Planning and Operations, BBNL

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