

THE EVOLUTION OF BHARATNET: LESSONS FROM INDIA'S LARGEST RURAL BROADBAND PROJECT

Policy Brief

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Abstract

The BharatNet project was launched in 2011 with the primary objective of bringing affordable and high-quality broadband services to the rural and remote regions of India. The project accelerated after several initial hiccups. The roll out of Bharat Net was catalysed by the introduction of new guidelines that permitted flexibility in implementation models. However, in order to sustain this momentum, continued policy focus will be necessary.

This policy brief traces the history of BharatNet and elaborates on five lessons that will help the programme achieve its stated objectives. Firstly, using a programmatic approach that focuses on infrastructure provisioning, network utilization and monetisation. Secondly, fostering flexible implementation models that are administratively coordinated and backed by financial support. Thirdly, using a combination of technologies that can boost implementation in far-flung areas. Fourthly, strengthening project monitoring and accountability mechanisms and finally customising interventions for NE and other backward regions. These recommendations also aligned with the new rules for Digital Bharat Nidhi defined in the Telecommunications Act, 2023.

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The Evolution of BharatNet: Lessons from India's Largest Rural Broadband Project

1. National Broadband Plans

The economic recovery programmes of many countries following the global financial crisis of 2008 were designed around providing fiscal stimulus for the expansion of affordable and high-quality broadband services to citizens. Known as 'networked recovery', government-funded national broadband programs were conceived as one of the ways for countries to create jobs and revenue.¹ Some examples from developed countries are provided in Table 1. Subsequently, the Broadband Commission for Sustainable Development advocated for all countries to design and adopt national broadband programmes and laid out targets to coordinate and promote universal broadband connectivity, including through providing affordable connectivity, promoting digital literacy, bridging divides, and encouraging the

use of digital financial services (See Appendix 1).

India launched its flagship broadband plan for promoting universal and affordable connectivity in 2011. Policy assessments and historical evidence suggests that universal service obligation funds (USOF) across countries, including India, have not been effective in meeting connectivity objectives, particularly affordable and high quality access. It is also argued that universal levies when replaced with incentives for private sector, can meet universal connectivity objectives more efficiently. However, the focus of this policy brief is not to analyse the design and efficacy of the USOF in India, but to provide a historical overview of India's national broadband plan supported by the USOF, analyse the lessons learnt, and highlight some key policy messages for the future.

Table 1: Country-Wise Broadband Programmes

Country	Launch Year	Programme	Description
Australia	2007	Australian Broadband Guarantee (ABG)	A one-off subsidy payment to registered internet service providers to connect and supply broadband services to eligible household and small business premises in regional, rural, and remote areas ²
United Kingdom	2010	Rural Broadband Programme	Subsidized up to 50% of capital expenditure for installing superfast broadband in rural and remote areas, with an initial investment of EUR 530 million ^{3,4} (See Box 3 for more information)
United States	2009	Broadband Infrastructure Program (under American Recovery and Reinvestment Act)	Allocation of USD 7.2 billion to extend broadband internet access in underserved and unserved areas, of which USD 2.5 billion was set aside for broadband grant, loan, and loan/grant combination programs to serve rural communities ⁵
Canada	2009	Economic Action Plan	An investment of CAD 225 million over three years to extend broadband coverage (of at least 1.5 Mbps) to unserved and underserved rural and remote households and businesses ⁶
Portugal	2008	Development and promotion of investment on next generation networks	Fiscal incentive of around EUR 50 million for subsidized investment in new-generation broadband networks to reach 1.5 million users by 2009 ⁷
France	2008	Digital France, 2012	An investment of around EUR 750 million for three years to achieve universal broadband access by 2010 and mobile broadband for everyone by 2012 ⁸
Germany	2009	German Broadband Strategy	Investment of around EUR 150 million to connect all unserved areas by 2010 and to provide 75% of households with high-speed internet (with 50 MBit/s or faster) by 2014 ⁹

1 OECD. (2009, June). Policy responses to the economic crisis: Investing in innovation for long term growth.

2 Department of Broadband, Communications, and the Digital Economy. (2010-11). Management of the Australian Broadband Guarantee Program.

3 Department for Digital, Culture, Media, and Sport. (August 2020). Rural Gigabit Connectivity Programme.

4 UK Parliament. (2015, January 28). Rural broadband and digital-only services.

5 Congressional Research Services. (2011, January 4). Broadband infrastructure programs in the American Recovery and Reinvestment Act.

6 Government of Canada. (n.d.). Canada's Economic Action Plan.

7 OECD. (2005, January 28). Next generation network development in OECD countries.

8 Caisse des Dépôts. (2013, June 28).

9 EU. (n.d.). Broadband in Germany.

Figure 1: BharatNet Key Milestones



Source: Compiled from PIB and media reports

2. A Historical Overview of BharatNet: Shifting Timelines and Scope

India's National Optical Fibre Network (NOFN) was launched in October 2011 and was aimed at providing on-demand broadband connectivity (of at least 100 Mbps) to 2.5 lakh Gram Panchayats (GPs) by using optical fibre cables (OFCs). In 2012, the Bharat Broadband Network Limited (BBNL) was established as a Special Purpose Vehicle for the deployment, management, and operation of NOFN. The project was initially set for completion within two years by 2014.¹⁰ However, it had limited success and was relaunched in 2015 as BharatNet. The phases of implementation of the BharatNet project provide insights into the progress and changes in scope, strategies, and timelines of the project (see Figure 1).

Initial targets for 2014 were met only in 2017. The reasons for delay were reviewed by Telecommunication Regulatory Authority India (TRAI), and the recommendations for addressing these were incorporated in a modified implementation strategy for Phase II approved in July, 2017 (see Appendix 2).^{11,12} The Phase-II target for reaching the remaining 1.25 lakh GPs by March 2019 was also unmet. By the end of 2019, approximately 14% of the target GPs were connected and only 4% of the targets were service ready. The deadlines for Phase II were revised to August 2021, then again to August 2023. In June 2021, the scope of the BharatNet project was expanded to cover 6.5 lakh villages by 2025 as part of¹³ Phase III, which also includes upgrading existing network architecture from linear to ring

topology and accelerating last-mile connectivity through revenue-sharing arrangements with village-level entrepreneurs. A phase-wise description of BharatNet is provided in Figure 1. Latest data from August indicates that around 86.75% of the total 2.5 lakh targeted GPs (in Phase I and Phase II) were service ready, and about 1.99 lakh villages were connected (30.43% of the target)¹⁴ (see appendices 3, 4, 5, and 6).

3. Five Key Policy Lessons from the BharatNet Project

3.1 Use a programmatic approach that focuses on infrastructure provisioning, network utilization, and monetization

While BharatNet has led to considerable progress in the expansion of middle-mile connectivity, network utilization has remained poor due to the lack of last-mile infrastructure. For instance, the provisioning of WiFi hotspots, which are commonly used for last-mile connectivity, has stagnated in 2021-24 (see Figure 2). Even in places where WiFi hotspots have been installed (in approximately 48% of service-ready GPs as of August, 2024), only around 6% were active.¹⁵ Only 2.01% rural households had a fibre-to-the-home (FTTH) connection as of February 2023, and only 10,94,118 more were commissioned, which left almost 97.36% rural households out of scope.^{16,17} As an incentive to expedite last-mile connectivity, the Department of Telecommunication (DoT) launched a scheme 2023 to recognize Internet Service Providers (ISPs) who provided the maximum additional rural FTTH connections under various categories.¹⁸

A significant initial misstep was a delayed focus on last-mile service provision. Project structure in the initial years assumed the existence of TSPs at the last mile, leading to a misalignment of plans.

10 Press Information Bureau. (2012, August 22). Internet connectivity to panchayats.

11 Telecom Regulatory Authority of India. (2016, February 2016). Recommendations on implementation strategy for BharatNet.

12 Ministry of Communications. (2018, August). Progress of implementation of BharatNet.

13 PIB. (2021, June 30). Cabinet approves BharatNet implementation through public private partnership model in 16 states with optical fibre connectivity to all inhabited villages.

14 Bharat Broadband Network Limited. (n.d.). Status of village covered under BharatNet project.

15 Bharat Broadband Network Limited. (n.d.). Status of village covered under BharatNet project.

16 Bharat Broadband Network Limited. (n.d.). Status of village covered under BharatNet project.

17 DoT. (n.d.). Experience sharing on Bharatnet Udyami & connectivity of ISPs to BharatNet.

18 PIB. (2023, September 11). Scheme for recognition of Internet Service Providers (ISPs) excelling in providing rural fiber to the home (FTTH) connections.

The lack of collaboration between BBNL and telecom service providers (TSPs) meant that locations for BharatNet fibre deployment were not aligned with the rollout plan of TSPs, which led to instances in which the fibre was not available in areas where they were required by the TSPs.¹⁹ The focus on last-mile connectivity was only introduced to the project scope in July 2017, when such misalignments led to service providers being less than forthcoming. Despite government efforts through outreach activities (e.g., conferences, meetings, discussions) and financial incentives (subsidized bandwidth and fibre lease charges), the participation of key stakeholders—i.e., TSPs, cable TV service providers, and other state agencies—in network utilisation was low.²⁰ As of February 2024, only 30.29% GPs were operational (i.e., had live BharatNet connections), and as of April 2024, only 1.19% of bandwidth availability had been utilized.^{21,22}

In the second phase of the project post 2017, the government enlisted a network of Common Service Centres (CSCs), which are e-services access points

aimed at expanding last-mile connectivity. In 2021, the Standing Committee on IT recognized the role of the CSCs in helping improve the maintenance and utilization of network. Data download increased from 50 TB per month to 2000 TB per month over a period of one and a half year.²³ However, the quality of the network continued to remain poor, largely due to delayed and poorly designed contracts for operations and maintenance.²⁴ The quality of the connections was not well monitored, and penalty clauses for delays in work completion were not included.^{25,26} Despite the Standing Committee's emphasis on the need for a comprehensive assessment of the BharatNet program, there was little progress.²⁷

Demand-side factors such as affordability, poor digital skills, and lack of local content, along with the lack of technical expertise among GP staff, also created a lag in utilization.

The utilization of networks depends on the availability of multiple digital ecosystem parameters.²⁸

Issues in the maintenance of network infrastructure and delayed network upgradation have been persistently responsible for poor utilization.

Following a programmatic approach enables not only holistic planning but also a holistic assessment of successes and failures. So far, such an approach has been adopted only in the state of Kerala.²⁹ Karnataka's approach also sets the standard for successfully rolling out the BharatNet program (see Box 1). The central government recently announced

a tripartite MoU between the DoT, Prasar Bharti, and Open Network for Digital Commerce (ONDC) to leverage BharatNet infrastructure for offering broadband services bundled with over-the-top (OTT) and e-commerce,³⁰ underscoring the importance of a comprehensive approach in implementation.

19 Telecom Regulatory Authority of India. (n.d.). Bharti Airtel Limited's response to consultation paper on "Implementation Model for BharatNet".

20 DoT. (2021, February). Standing Committee on Information and Technology.

21 Patil, G., Dwivedi, H., & Yadav, D., (2024, February 6). Digitalisation of panchayats

22 Bandwidth utilization has been calculated as a share of minimum bandwidth availability. Minimum bandwidth availability = (100 * No. of service-ready GPs) as each service-ready GP under BharatNet is expected to provide a minimum 100Mbps bandwidth. As of 29 April 2024, bandwidth usage stood at 2,57,011 Mbps, while the number of service-ready GPs was around 2,15,924.

23 Tharoor, s. (2021). Twenty-Third Report Standing Committee on Information Technology (2020-21) Ministry of Communications (department of telecommunications) Demands for Grants (2021-22). in Lok Sabha Secretariat [report]

24 India Mobile Congress, 2023

25 Voicendata Bureau. (2022, June 22). BharatNet Phase – III: Towards the final digital inclusion of India's hinterland.

26 tele.net. (2021, July 7). CAG blames CSC for poor quality services offered by BharatNet infrastructure.

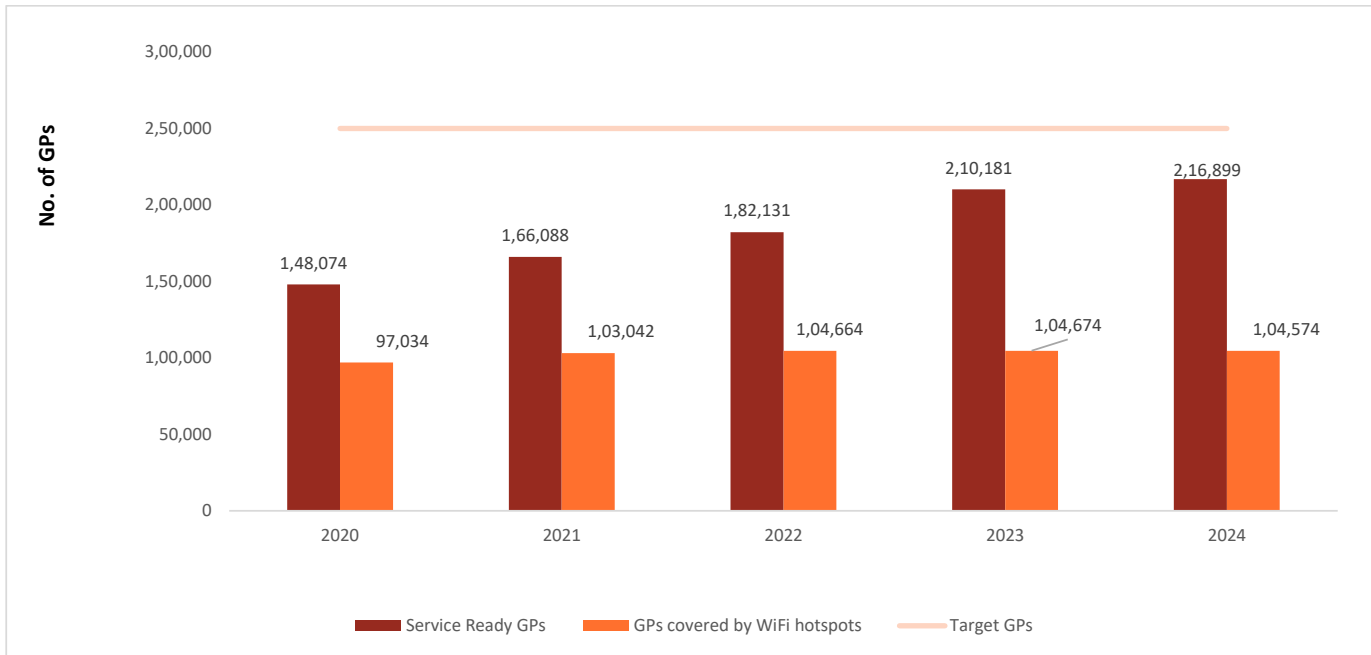
27 DoT. (2021, February). Standing Committee on Information and Technology.

28 Uppuluri, S. (2020). Bharatnet: The way forward. IIMB.

29 DoT. (2020, March). 10th Report: Action Taken by the Government on the Observations/Recommendations of the Committee contained in their Fiftieth Report (Sixteenth Lok Sabha) on 'Progress of Implementation of BharatNet. Standing Committee on Information Technology.

30 PIB. (2024, March 12). Tripartite MoU signed among USOF, Prasar Bharati and ONDC: Propelling the mandate for digital empowerment for rural India.

Figure 2: Disparity in Middle-Mile (Service-Ready GP) vs Last-Mile Connectivity (WiFi GP)



Source: DOT Annual Reports, BBNL, BBNL Annual Reports ^{31,32}

Box 1: Karnataka Case Study

Karnataka has been cited as one of the states that has focused on holistic implementation from Phase I onwards. All the state’s 6,085 GPs were made service-ready in this phase, and 95% network uptime was maintained through both the laying of new OFC by BBNL, the efficient utilization of existing cables of BSNL, and the proactive replacement of faulty cables. Various e-governance applications, such as those pertaining to the digitization of land records, agricultural extension services for farmers, and PDS for food distribution were developed by the state in local languages, which enabled village-level assistants to work comfortably on these apps and drove the adoption of e-services.

3.2 Foster flexible implementation models that are administratively coordinated and backed by financial support

The lack of ownership and state involvement was one of the primary reasons for poor outcomes in Phase I of the BharatNet project. Recognizing differential state capacity in digital infrastructure, Phase II implementation provided for state-led models of

deployment that was adopted by Maharashtra, Tamil Nadu, Andhra Pradesh, Telangana, Gujarat, Odisha, Jharkhand, and Chhattisgarh. Since some of these states had relatively well-developed ecosystems for the delivery of e-governance services, they were expected to not only accelerate the progress of infrastructure development but also facilitate its utilization.³³

The results of the state-led model revealed a mixed bag, with expedited progress in some states and stalled progress in others.

31 DoT, reports and statistics - Annual Report. (n.d.)

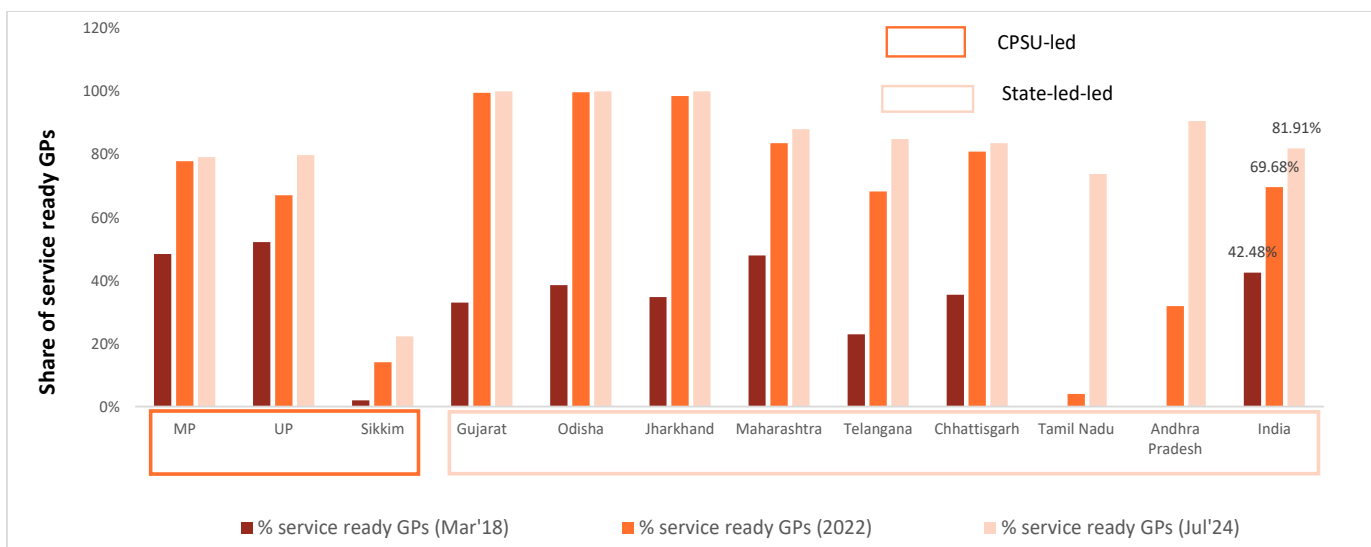
32 BBNL, Bharat Broadband Network Limited, Delhi, Bharat, Broadband, Network, Limited, Special Services Telecom, National Optical Fibre Network. (n.d.-a). Annual Report, Ministry of Communications & Information

33 DoT. (August, 2018). 50th Report: Progress of implementation of BharatNet. Standing Committee on Information Technology.

However, even in states that were self-driving the BharatNet programme, outcomes varied due to policies adopted at the local level. While Maharashtra decided to eliminate the requirement for taking Right of Way (RoW) permission—which was a critical bottleneck in infrastructure deployment—progress in other states was slow due to delays in clearances (see Box 2).^{34,35} Gujarat, Odisha, and Jharkhand were close to achieving 100% of their target by the end of 2022, whereas Andhra Pradesh (31.9%), Tamil Nadu (3.98%), and Telangana (68.26%) were lagging (see Figure 3). However, by the end of 2023, most states

under the state-led model had plugged the gaps and managed to achieve a higher share of service-ready GPs.³⁶ Progress in Tamil Nadu was slowed due to issues with the tender and Centre-State coordination. The model has largely been a success, with coverage under the model experiencing a significant increase, from 5.30% in 2019 to 86.25% in 2023.³⁷ In contrast, states under the Central Public Sector Undertaking (CPSU) model in Phase II (Madhya Pradesh, Uttar Pradesh (East and West), and Sikkim) experienced a lower increase in coverage, from around 50.91% in 2018 to 76.81% by the end of 2023.³⁸

Figure 3: Progress Under the State-Led Model vs. Central Public Sector Undertaking-Led Model



Source: Lok Sabha questions and BBNL website^{39,40}

Box 2: Maharashtra Case Study

Mahanet Phase II of the BharatNet programme in Maharashtra’s state-led implementation model, aimed to connect around 13,000 GPs with high-speed broadband. To expedite progress, the project was given the status of a ‘Vital Public Purpose Project’, and several RoW permissions and charges as well as administrative and other fees were waived off. Maharashtra was also one of the few states to adopt a technically advanced architecture early on: a ‘mesh-ring’ topology that is considered to be more reliable than linear topology.

Source: Building an Inclusive Digital Society for Rural India⁴¹ & Maharashtra Government Resolution⁴²

34 Sivapriyan. (2022, June 9). BharatNet kicks off in Tamil Nadu after long delay.

35 Aryan, A. (2020, October 7). Punjab close to BharatNet phase 2 work completion, other states lagging. The Indian Express.

36 BBNL. (2023, December 6). District wise details of GPs under BharatNet.

37 Calculated from annual BBNL statistics.

38 Calculated from annual BBNL statistics.

39 BBNL, Bharat Broadband Network Limited, Delhi, Bharat, Broadband, Network, Limited, Special Services Telecom, National Optical Fibre Network. (n.d.-a). Annual Report, Ministry of Communications & Information

40 National Informatics Centre. (n.d.). Digital Sansad. Digital Sansad.

41 Kathuria, R., Kedia. M., Raj. A., Sekhani. R., & Sinha. S., (2021, November). Building an inclusive digital society for rural India. ICRIER.

42 Government of Maharashtra. (2018, February 17). Single window clearance to the Right of Way for BharatNet project.

The third model of implementation, i.e., private-sector-led implementation, was adopted in the states of Punjab and Bihar in Phase II. Two private companies in each state (i.e., HFCL and Vindhya Telelinks Limited (VTL) in Punjab and VTL and Polycab in Bihar⁴³) were selected for installing the infrastructure. As of 2023, both states have achieved near-universal coverage of GPs (see Appendix 7). Punjab also maintained 97% uptime as of 2020.⁴⁴

In order to harness private-sector efficiencies, a Public Private Partnership (PPP) model that included the creation, upgradation, operation, and maintenance and utilization of the network was planned across 16 states in 2021.⁴⁵ However, the failure to attract any bids highlights industry concerns such as limited viability gap funding, uncertainty about the quality of assets to be transferred, lack of exemption of RoW and other charges, as well as some stringent

conditions pertaining to Service Level Agreement (SLA) requirements and design conditions.⁴⁶ The primary concern was the dependence on the utilization and monetization of the network for the recovery of investments—a risk that the private sector was unwilling to take due to lower rural demand.⁴⁷ Subsequently, a new model under BharatNet Phase III was introduced that enabled private-sector participation in two categories⁴⁸: construction and maintenance of the network; and last mile service provision supported by viability gap funding (BharatNet Udyami model).⁴⁹ However, a fresh tender issued in February 2024 under the first category created new concerns pertaining to the lack of equitable treatment of domestic and foreign telecom equipment companies, leading to further delays in bid submissions.^{50,51} Experience from Project Gigabit in Europe can provide learnings for India (see Box 3).

Box 3: Project Gigabit: An Example of PPP

Project Gigabit was conceptualised to provide high-speed internet (1 Gbps or 1,000 Mbps) in the UK, in line with other European countries like Spain, Denmark, and Romania. As of 2024, the project has covered 75% of UK households, 87.5% of which have 30 Mbps broadband speed. The government is meeting their targets in hard-to-reach areas through a joint effort between all stakeholders in the region. The voucher scheme is one such provision that is provided to residents and Small and Medium sized Enterprises to avail the services a supplier-led approach to provide gigabit-capable internet services. The voucher scheme allows businesses to encash vouchers with a face value between GBP 500 and GBP 3,500, whereas citizens can encash vouchers worth GBP 1,500. This scheme incentivises private players to participate in building infrastructure and providing services in remote areas. The private player is compensated only after proof of service is provided to the government against the number of vouchers. In Q1 of FY 2019-2020, an GBP 168 million (INR 1.6 billion equivalents) was expended on the voucher scheme.

Source: Gov.uk⁵² and Department for Digital, Culture, Media & Sport⁵³

43 PIB. (2022, July 2). Inspection protocols of fibre cables under BharatNet.

44 Aryan, A. (2020, October 7). Punjab close to BharatNet phase 2 work completion, other states lagging. The Indian Express

45 PIB. (2021, June 30). Cabinet approves BharatNet implementation through public private partnership model in 16 states with optical fibre connectivity to all inhabited villages.

46 DoT. (2023, March). 43rd Report: Demand for Grants (2023-24). Standing Committee on Information Technology.

47 Josun, J. (2022, June 22). BharatNet – Gathering momentum despite a slow start. Voicendata.

48 Bharatnet. (2024, July 31). BharatNet Phase 3 Tender: TCIL goes for major bid.

49 DoT. (n.d.). Experience Sharing on Bharatnet Udyami & Connectivity of ISPs to Bharatnet.

50 Grover, J. (2024, February 20). BSNL rolls out Rs 65k-cr tender for BharatNet. Financial Express.

51 Abbas, M. (2024, March 20). BSNL's BharatNet III: Domestic telecom gear makers cry foul. Telecom.com.

52 Gov.UK. (2021, June 1). Detailed overview of the Gigabit Infrastructure Subsidy Scheme v0.7.

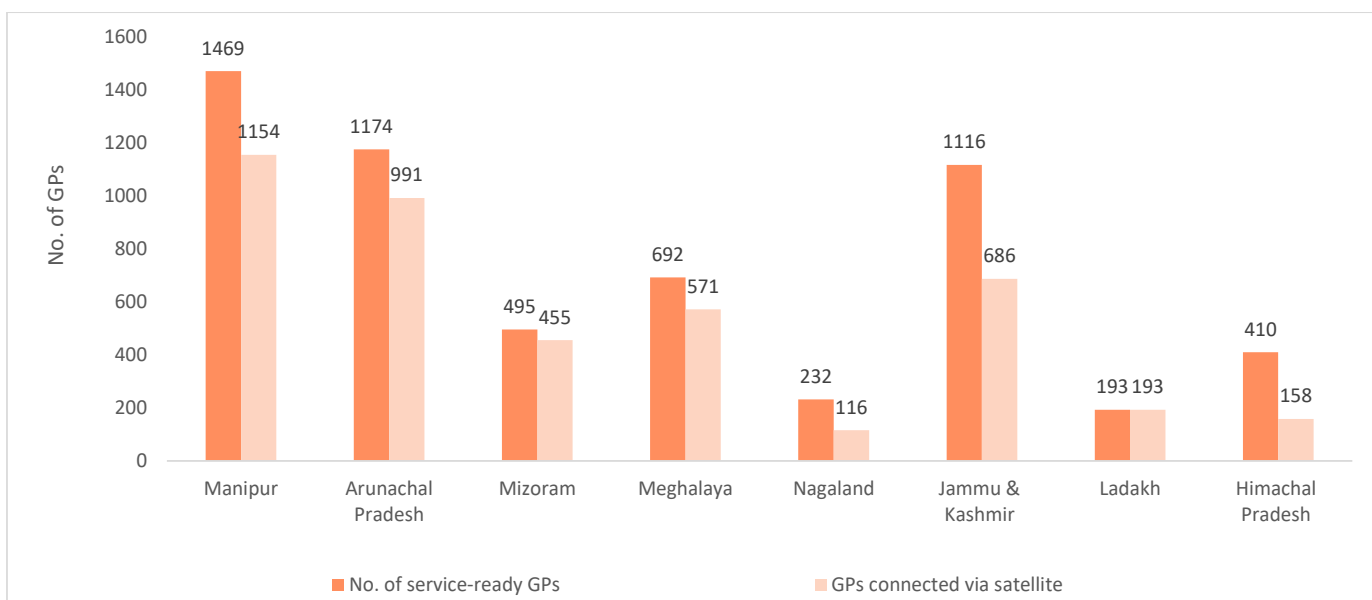
53 Department for Digital, Culture, Media and Sport. (n.d.). Gigabit Broadband Voucher Scheme.

3.3 Use combinations of technologies to boost BharatNet implementation

Due to the various constraints associated with the installation, maintenance, and costs of laying OFC in hilly and remote regions, Phase II incorporated the use of technologies besides OFC. The cost of terrestrial rural backhaul is estimated to be five to ten times higher than in urban areas,⁵⁴ and the cost of taking fibre connectivity to the last mile per home is approximately 10-20 times greater in rural and remote areas compared to urban regions.⁵⁵

In January 2018, Mawniandlah in Meghalaya became the first GP to become service-ready on satellite.⁵⁶ By the end of 2023, it was estimated that over 60% of service-ready GPs in several northeast and other hilly areas had been connected via satellite (Figure 4). Overall, as of 2023 around 95% of the total GPs across the country targeted to be connected via satellite are service-ready.^{57,58} Satellite services under BharatNet are being provided at highly subsidized rates,⁵⁹ with tariffs for individual WiFi customers set at INR 60 for 30 GB data per month and INR 500 for 100 GB per month.⁶⁰ Accordingly, service providers may require longer term subsidy support for satcom services to remain viable.⁶¹

Figure 4: GPs in the Northeast and Hilly Regions Connected via Satellite (December 2023)



Source: BBNL ⁶²

54 Jain, R. (2023, July). Universal coverage, enhancing spacecom sector growth, and supporting democratic ethos: The role of satellite spectrum assignment. ICRIER.

55 Krishna, K. (2015). Satellite for rural broadband. In Brainstorming Broadband.

56 Yadav, D. (2017, January 7). Mawniandlah becomes first Gram Panchayat to have satellite-based internet in India. Entracker.

57 District wise details of GPs under BharatNet as on 06.12.2023 (n.d.).

58 USOF. (n.d.). Digital Bharat Nidhi. BharatNet Project.

59 Bharat Sanchar Nigam Limited. (n.d.). Annexure 16A: Part 2.

60 BBNL, Bharat Broadband Network Limited, Delhi, Bharat, Broadband, Network, Limited, Special Services Telecom, & National Optical Fibre Network. (n.d.). BHARATNET TARIFF. Ministry of Communications & Information Technology, Govt. of India.

61 Guliani, K. S. & Reliance Jio Infocomm Limited. (2023). RJIL's comments on TRAI's consultation paper on "Digital Inclusion in the Era of Emerging Technologies."

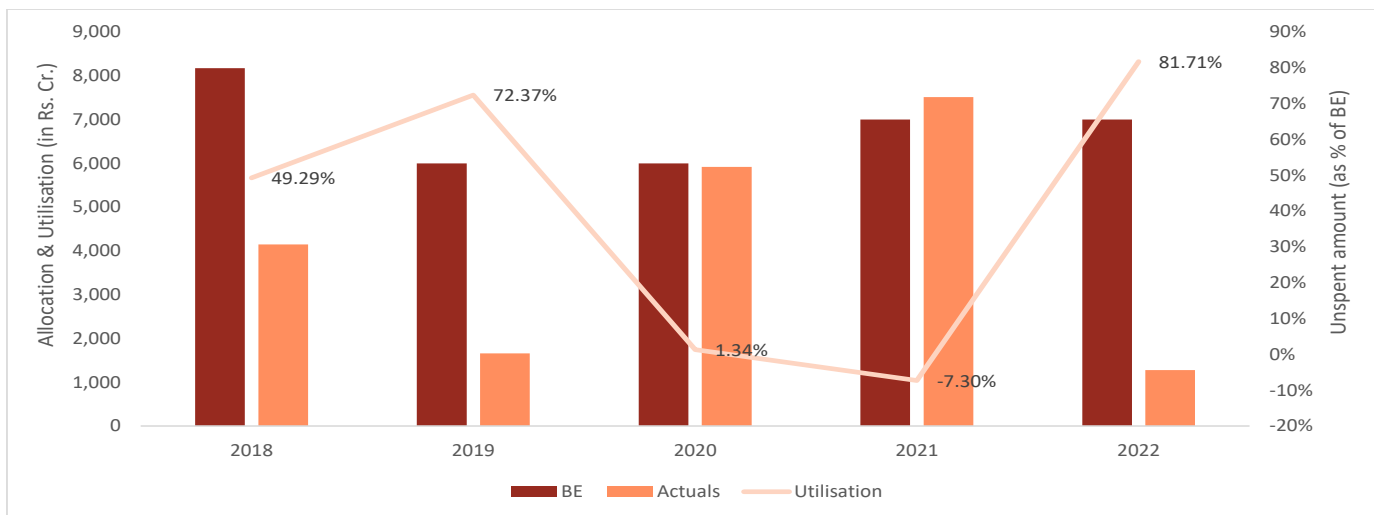
62 BBNL, Bharat Broadband Network Limited, Delhi, Bharat, Broadband, Network, Limited, Special Services Telecom, National Optical Fibre Network. (n.d.-b). BHARATNET TARIFF, Ministry of Communications & Information Technology, Govt. of India

Developments in 2023-2024, such as regulatory reforms in the satellite communications sector⁶³ and the increasing interest of new private players⁶⁴—are expected to further enhance the complementary impact of satellite broadband in bridging the digital divide in remote areas. New satellite constellations are not only improving the capacity of satellite broadband but could also result in reduced costs of connectivity, making it a viable alternative in remote areas.⁶⁵ The estimated market potential for satellite broadband is estimated to reach around USD 263 million in the next five years.⁶⁶

3.4 Strengthen project monitoring and accountability systems at the national and state levels to ensure optimum utilization of public funds and delivery of key project outcomes

The lack of adequate planning and preparedness has resulted in implementation setbacks as well as a persistent underutilization of funds allocated to BharatNet (Figure 5).

Figure 5: The Utilization of Funds Under the BharatNet Project



Source: Compiled from Parliamentary Committee Reports⁶⁷

During 2020-22, the network uptime ranged around 50-58%, against the target of 95%.⁶⁸ In the absence of service-level agreements that prescribe timelines and penalty clauses for CSCs, network maintenance remained poor despite large payments.⁶⁹ Despite recommendations by the Parliamentary Committee to monitor Quality of Service (QoS), it did not receive adequate focus and was largely left to individual ISPs.⁷⁰ In its assessment, the Comptroller And Auditor General (CAG) highlighted other issues such as delays in appointing full-time officials in BBNL, lack of transparency in bidding processes, and poor monitoring.^{71,72} In BSNL’s most recent tendering, individual Committees for Evaluation of Tender (CETs)

were created to provide clear recommendations on technical bids.⁷³

An overhauling of the oversight and accountability mechanism will help address these wide-ranging issues. Granular reporting, public dashboards, and well-designed contract and service agreements will enable data-driven decision-making and improve project outcomes. Given the substantial government investment in BharatNet and its potential to accelerate digital transformation of rural areas, institutionalisation of monitoring and oversight mechanisms is essential.

63 Satellite Communication Reforms - 2022 | Department of Telecommunications | Ministry of Communication | Government of India. (n.d.).

64 Nair, P. (2024, September 16). BBNL to soon offer satellite net in N-E; wraps up Arunachal pilot. The Indian Express.

65 Telecom Regulatory Authority of India. (2023, January 2). Broadcasting infrastructure and services: A framework for the next generation.

66 Indian Space Association, NASSCOM, & Deloitte. (n.d.). Exploring opportunities for Indian downstream spacetechnology.

67 National Informatics Centre. (n.d.). Digital Sansad. Digital Sansad.

68 BBNL annual reports

69 Abbas, M. (2021, July 8). Auditor slams Common Service Centre for poor service quality in BharatNet programme. The Economic Times.

70 Parliament of India, Lok Sabha Committee on Communications and Information Technology. (n.d.). Report on communications and information technology.

71 Prajwal Suvarna, DHNS, Prajwal Suvarna, & DHNS. (2021, August 9). BharatNet: Digital India’s biggest miss. Deccan Herald.

72 ETMarkets.com. (2024, September 10). Beyond stock market: How to ace commodity trading. The Economic Times.

73 Kumar, A. (2024, September 4). BSNL’s committees for evaluation of BharatNet Phase-III bids to submit final report on Sept 10. ETTelecom.com.

3.5 Customize implementation for Northeast states and economically weaker regions

As with most other modes of infrastructure, the Northeast (NE) states and other economically weaker regions have lagged behind in the BharatNet project. In Phase I, when the national average for service ready GPs was 42% (with several states such as Rajasthan, Karnataka, Haryana, and Kerala achieving more than 50%), in most NE states, less

than 10% of the GPs were service-ready (Figure 6).⁷⁴ Even by the end of 2023, less than 60% of the GPs in NE states were service-ready, against the national average of 79%.⁷⁵

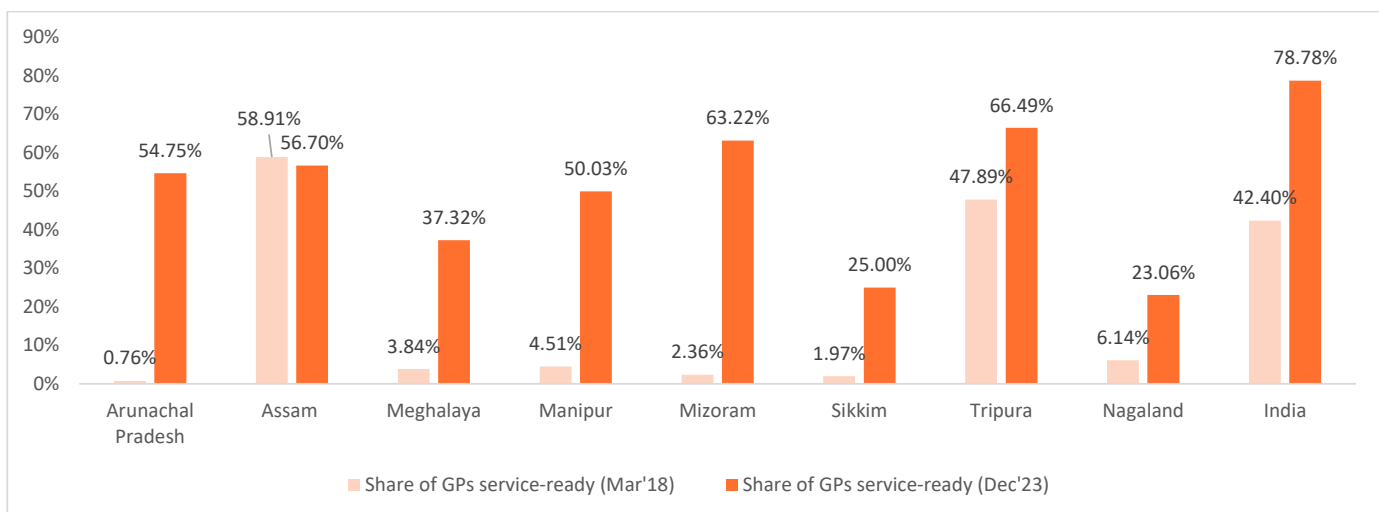
The slow pace in the NE region has been attributed to several factors, including developmental activities such as the expansion of national highways, the hilly terrain, the remoteness and inaccessibility of areas, and law and order issues.⁷⁶

The practical limitations of connecting the NE are often compounded by poor implementation.⁷⁷

Besides the NE states, underdeveloped blocks in other states are also lagging behind in digital infrastructure. Only around 30% of the 500 aspirational blocks across all states and Union Territories have at least

one live BharatNet connection.⁷⁸ Therefore, in the aspirational blocks, BharatNet implementation must be integrated with development policies.

Figure 6: BharatNet Progress in the NE Region



Source: Standing Committee Report on 'Progress of Implementation of BharatNet and BBNL'⁷⁹

4. Conclusion

In the 12 years since its initiation, the BharatNet initiative has experienced several fluctuations. While it got off to a slow start, corrective measures have helped expedite progress in laying fibre. However, the lack of a programmatic approach resulted in a delayed focus on last-mile connectivity, network

quality, and network utilization.

Some of these issues have been addressed in the latest phase of the scheme, i.e., Phase III, through sub-initiatives such as Bharat Udyami (a pilot programme for the provision of five lakh FTTH connections across the country). The initial results have been encouraging: data utilisation by rural customers has

⁷⁴ Standing Committee on Information Technology. (2018). Progress of implementation of Bharatnet. In Fiftieth Report. Lok Sabha Secretariat.

⁷⁵ District wise details of GPs under BharatNet as on 06.12.2023. (n.d.).

⁷⁶ Singh, B. (2018, January 16). Northeast to get Rs 15,000 crore for improving telecom connectivity. The Economic Times.

⁷⁷ Singh, B. (2018, January 16). Northeast to get Rs 15,000 crore for improving telecom connectivity. The Economic Times.

⁷⁸ Champions of Change. (n.d.).

⁷⁹ Jadhav, P. (2023). Thirty ninth report. In standing committee on communications and information technology [report]. Lok Sabha Secretariat

increased by around 300% (from 40 GB per user in May 2022 to 160 GB per user in May 2023) and data downloads have increased by 119 times (from 459 TB in May 2022 to 55,196 TB in May 2023). Maintaining this momentum on data utilization among rural customers would require a sustained focus on addressing supply-side constraints such as network quality and complementary demand-side factors such as device affordability and digital literacy. Therefore, the government must institutionalize accountability mechanisms that constantly monitor progress and enable better outcomes.

Regional disparities in access to digital infrastructure point towards the need to develop focused initiatives that can address existing socio-economic concerns as well as implementation challenges. The Digital

Bharat Nidhi (which replaced the Universal Service Obligation Fund) under the Telecommunication Act, 2023 is a step in the right direction, bringing a more targeted focus to underserved areas and marginalized groups. It also expands the scope of services and details rules pertaining to implementation, monitoring, and funding (Table 2). The recommendations in this policy brief are aligned to these rules; however, the government must make efforts to ensure implementation.

As the scheme enters its final phase in 2024 there is also a need for impact assessments. Data-driven decision making and policy choices will help achieve the broader objective of the program, adding value to the rural economy and the quality of life of rural Indians.

Table 2: Comparison of Rules Governing the USOF and Digital Bharat Nidhi

	Rules for the Administration of the USOF (2004, 2006)	Rules for the Administration of Digital Bharat Nidhi (2024)
Scope of services	Provision of public telephone and information centres, household telephones, infrastructure for mobile services and broadband connectivity, general infrastructure for development of telecom facilities and the induction of new technological developments	Provision of mobile and broadband services, introduction of next generation telecom technologies, promotion of Research & Development (R&D), encouragement of start-ups, promotion of sustainable technologies, and development and establishment of relevant standards
Target group	Focus on rural and remote areas	Besides rural and remote areas, a focus on underserved urban areas as well as women, persons with disabilities, and economically weaker sections
Administration	Monitoring the powers of the administrator “as per the procedure specified by him from time to time”	More specific rules on the powers of the administrator regarding the oversight of implementers of projects, thus enabling monitoring, evaluation and verification of work done, specification of procedures and records to be maintained, creation of digital portal for facilitating reporting and monitoring, engagement of third parties for impact assessments, etc.
Selection of implementors and funding mechanism	Selection of a Universal Service Provider through the bidding process only, with funding support provided to cover the net cost of a specified Universal Service Obligation	Bidding process in some areas of funding, and selection by application for other areas, with modalities of funding determined on case-to-case basis including, but not limited to, full funding, partial funding, co-funding, market risk mitigation, and risk capital

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Appendix

Appendix 1: Broadband Commission 2025 Advocacy Targets

Advocacy Targets	Description
<u>Target 1:</u> Make broadband policy universal	By 2025, all countries should have a funded National Broadband Plan (NBP) or strategy, or include broadband in their Universal Access and Service (UAS) Definition
<u>Target 2:</u> Make broadband affordable	By 2025, entry-level broadband services should be made affordable in low- and middle-income countries (LMICs) at less than 2% of monthly Gross National Income (GNI) per capita
<u>Target 3:</u> Get everyone online	By 2025, broadband-internet user penetration should reach 75% worldwide; 65% in LMICs; and 35% in least developed countries
<u>Target 4:</u> Promote digital skills development	By 2025, 60% of youth and adults should have achieved at least a minimum level of proficiency in sustainable digital skills
<u>Target 5:</u> Increase the use of digital financial services	By 2025, 40% of the world's population should be using digital financial services
<u>Target 6:</u> Get MSMEs online	By 2025, improve connectivity of micro-, small- and medium sized enterprises (MSMEs) by 50%, by sector
<u>Target 7:</u> Bridge the gender digital divide	By 2025, achieve gender equality across all targets

Source: Broadband Commission for Sustainable Development⁸⁰

Appendix 2: Implementation Issues under BharatNet Phase I and Subsequent Corrective Measures

Implementation Issue	Modified Strategy
Provision of connectivity only by laying underground OFC	Optimal mix of OFC, radio, and satellite for providing connectivity to GPs
Poor quality of existing BSNL fibre used to connect block to the GP	Laying fresh OFC from block to GP for providing network stability and better quality of service
Project implementation only through three CPSUs: BSNL, RailTel, and Power Grid Corporation of India Limited (PGCIL)	Associating states and the private sector in project implementation
Centralized procedure for procurement and sourcing of equipment through BBNL	Decentralized decision-making and procurement of equipment
RoW constraints	Signing of MoUs with state governments and implementing the new RoW policy, "Indian Telegraph RoW Rules, 2016", for expeditious clearance

Source: Progress of Implementation of BharatNet', Standing Committee on Information Technology, August, 2018⁸¹

80 ITU/UNESCO Broadband Commission for Sustainable Development. (2023, October 3). Policy recommendations - Broadband Commission. Broadband Commission.

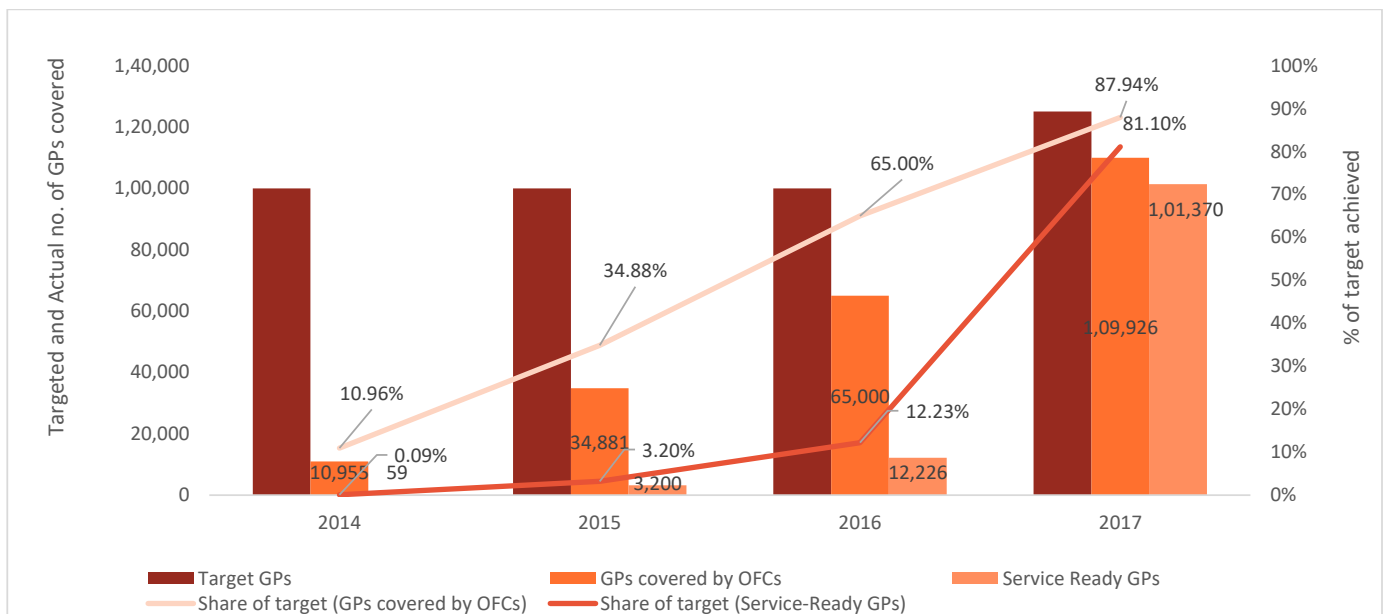
81 Standing Committee on Information technology. (2018b). Progress of implementation of Bharatnet. In fiftieth report [report]. Lok Sabha secretariat.

Appendix 3: Phase-Wise Features and Progress of BharatNet Project

	Phase I (2011)	Phase II (2017)	Phase III (2021)
Scope	Coverage of 1,00,000 GPs with 100 Mbps broadband connectivity using approximately INR 70,000 crores as initial allocation	Scope revised to provide coverage of remaining 1,50,000 GPs with 100 Mbps broadband connectivity in the 2018 and provision of last-mile architecture for all 2.5 lakh GPs through setting up 12.5 lakh WiFi hotspots (five hotspots in each GP on average) or other suitable broadband technology. In 2017, INR 42,068 crores, and an additional INR 24,473 in September 2020 was disbursed by BBNL.	Scope revised to extend coverage of 100 Mbps broadband connectivity beyond GPs to all 6.4 lakh inhabited villages (approx.) using the ring topology network architecture. In 2023, the Cabinet approved INR 1.39 lakh crore.
Technology	Underground Optical Fibre Cable (OFC)	Optimal mix of underground and aerial OFC, radio, and satellite	Optimal mix of underground and aerial OFC, radio, and satellite
Implementation Model	CPSU-led (under BBNL)	CPSU-led, State-led, Private-sector-led	PPP model and partnership with Village-Level Entrepreneurs (VLE) on a 50:50 revenue-sharing basis
Progress	100% target achieved (2017)	As of July 2024: <u>Service-ready GPs:</u> 2.16 lakhs (86.75% of target) <u>Active Wi-Fi hotspot coverage:</u> 6,103 GPs (2.44% of target) <u>FTTH connections commissioned:</u> 10,94,118 (9.5% gap in target) ⁸²	<u>Connected villages:</u> 1.99 lakhs (30.43% of target) as of July 2024

Source: Parliamentary Standing Committee Reports, PIB, and BBNL website.

Appendix 4: Progress Under BharatNet Phase I

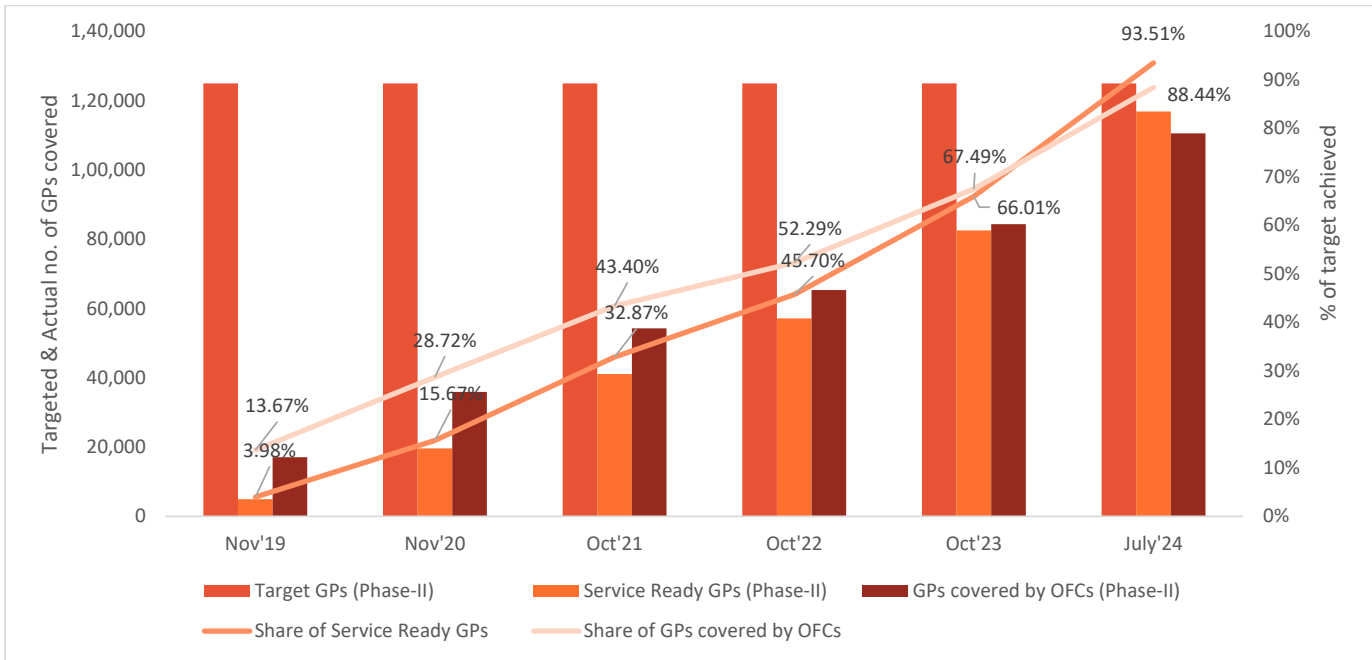


Sources: DOT Annual Reports, BBNL, BBNL Annual Reports, Lok Sabha Starred Question No. 73 (07/02/2018)

Note: Initial Phase I target (coverage of 1,00,000 GPs) was achieved by December 2017. However, there was a revision of the work front under this phase, which included coverage of an additional 25,000 GPs. Thus, by the end of 2017, 19% of the revised work front remained to be completed.

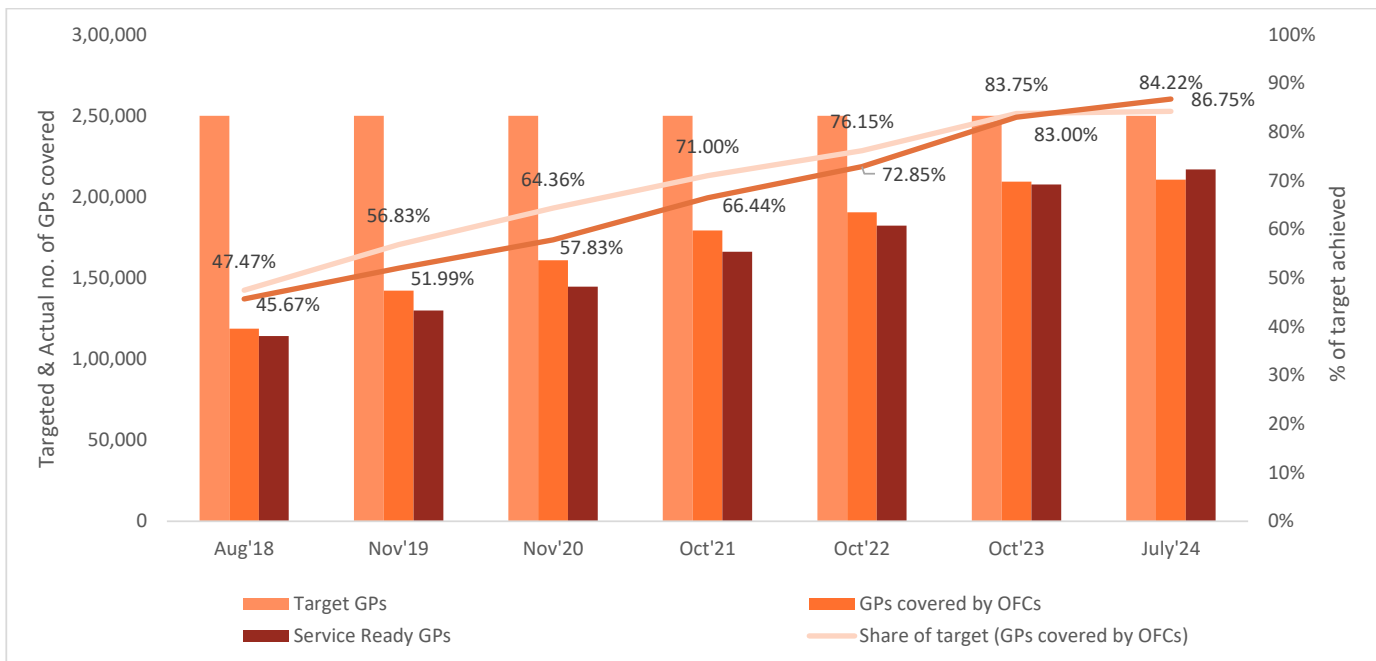
82 Under the BharatNet program, the target is to provide 1.5 crore rural home fibre connections. As of February 2023, there were 3,545,183 rural FTTH connections so, gap in target= 11,454,817

Appendix 5: Progress Under BharatNet Phase II



Sources: DOT Annual Reports, BBNL, BBNL Annual Reports^{83, 84}

Appendix 6: Cumulative Progress Under BharatNet (Phase I & II)



Sources: DOT Annual Reports, BBNL, BBNL Annual Reports^{85, 86}

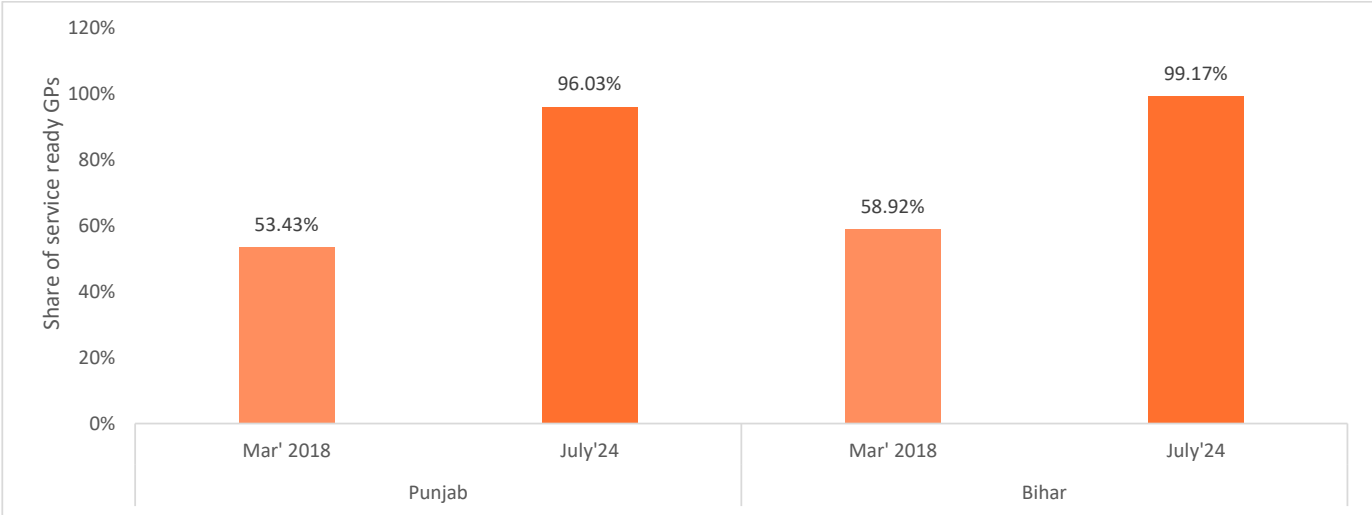
83 BBNL, Bharat Broadband Network Limited, Delhi, Bharat, Broadband, Network, Limited, Special Services Telecom, National Optical Fibre Network. (n.d.-a). Annual Report, Ministry of Communications & Information Technology, Govt. of India

84 DoT, reports and statistics - Annual Report. (n.d.).

85 Ibid.

86 Ibid.

Appendix 7: Progress in Private-Sector Model



Source: Lok Sabha and BBNL website



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