

Demand for Grants 2023-24 Analysis

Telecommunications

The Department of Telecommunications under the Ministry of Communications is responsible for promotion and regulation of the telecom sector. The Department also administers several public sector undertakings involved in providing telecommunication services, consultancy, and equipment manufacturing. This note examines the allocation to the Department in 2023-24, trends in expenditure over the last few years, and discusses certain key issues in the sector.

Overview of Finances

Expenditure¹

In 2023-24, the Department has been allocated Rs 97,579 crore, an increase of 19% over the revised estimates of 2022-23 (Table 1). The allocation to the Department in 2023-24 is 2.2% of the total budget of the central government. As compared to 2021-22, a significantly higher allocation has been made in both 2022-23 and 2023-24 mainly for financial support to BSNL. Support to BSNL has been announced in two tranches: (i) revival plan for BSNL and MTNL approved by the Cabinet in October 2019 and (ii) revival package for BSNL amounting to Rs 1.64 lakh crore approved by Cabinet in July 2022.^{2,3}

The 2019 revival plan sought to provide for: (i) capital infusion for allotment of 4G spectrum, and (ii) costs towards voluntary retirement scheme. The budgetary trend shows that while funds were provided for the voluntary retirement scheme,

Table 1: Allocation for 2023-24 (Rs crore)

	2021-22	2022-23 BE	2022-23 RE	2023-24 BE	% change (22-23 RE to 23-24 BE)
Revenue	28,471	30,436	44,575	35,887	-19%
Capital	3,328	54,150	37,246	61,692	66%
Total	31,798	84,587	81,821	97,579	19%

Note: RE: Revised Estimates; BE: Budget Estimates.

Sources: Expenditure Budget, Union Budget 2023-24; PRS.

no capital infusion took place in either 2020-21 or 2021-22 (Table 2). The 2022 revival package reiterates the allotment of spectrum. It includes: (i) allocation of spectrum for ongoing and 4G services worth Rs 44,993 crore, (ii) settlement of statutory dues worth Rs 33,404 crore by conversion into equity, (iii) financial support for capital expenditure worth Rs 22,471 crore over four years, and (iv) Rs 13,789 crore as viability gap funding for rural wireline operations between 2014-15 and 2019-20.³

As per the revised estimates for 2022-23, capital infusion of Rs 33,269 crore is expected in BSNL. In addition, capital infusion of Rs 52,937 crore has been proposed in 2023-24. In 2022-23, while capital infusion has been revised down as compared to the budget stage, viability gap funding of Rs 18,127 crore has been added at the revised stage. In 2023-24, Rs 1,740 crore has been allocated towards viability gap funding. In contrast with the revival plan, no funds have been given to MTNL for 4G spectrum in any of the years.

Table 2: Expenditure towards revival plan for BSNL and MTNL (Rs crore)

Head	2020-21		2021-22		2022-23		2023-24
	Budget	Actual	Budget	Actual	Budget	Revised	Budget
Capital Infusion in BSNL	14,115	0	14,115	0	44,720	33,269	52,937
Implementation of VRS (BSNL/MTNL)	3,295	3,028	3,000	3,473	3,300	3,300	2,671
Grants for payment of GST-BSNL	2,541	0	2,541	-	3,550	0	2,218
Viability Gap Funding	-	-	-	-	-	18,127	1,740
Waiver of Guarantee Fee	-	-	-	-	-	73	174
Ex-gratia payment to voluntarily retiring employees (BSNL/MTNL)	9,889	11,162	-	-	-	-	-
Capital infusion for 4G spectrum-MTNL	6,295	0	6,295	0	-	-	-
Grants for payment of GST-MTNL	1,133	0	1,133	0	-	-	-
Total	37,268	14,190	27,084	3,473	51,570	54,769	59,740

Sources: Union Budget Documents of various years; PRS.

Major Expenditure Heads

In 2023-24, about 56% of the total expenditure is allocated towards support to PSUs. As discussed earlier, this mainly comprises the expenditure towards the revival plan for BSNL. Pension expenditure is estimated to have the second-largest share in 2023-24 (19%). The pension provision is for pensionary benefits of the employees of the Department including employees absorbed in BSNL, and employees of MTNL with effect from April 2014.¹ Pension obligation is expected to increase sharply in 2022-23 as compared to the previous year (31% increase over 2021-22). This may be due to employees of BSNL and MTNL opting for voluntary retirement scheme under the 2019 revival plan.⁴

In 2023-24, the allocation towards Bharatnet and compensation to telecom service providers (TSPs) are expected to increase significantly as compared to the previous year. However, in 2022-23, allocation to these schemes have been revised down by 79% and 31%, respectively. Bharatnet is the scheme which aims to connect all villages with optical fibre network. Compensation is provided to TSPs for augmentation of infrastructure in rural and remote areas, and maintenance of village public telephones.

Table 3: Major expenditure heads in 2023-24 (Rs crore)

Expenditure Head	2021-22 Actual	2022-23 RE	2023-24 BE	% change (22-23 RE to 23-24 BE)
Support to PSUs	3,964	55,267	60,110	9%
Pension	14,864	19,436	20,650	6%
Bharatnet	7,511	1,500	5,000	233%
Compensation to TSPs	789	1,380	5,000	262%
Network for defence services	3,070	1,961	2,158	10%
PLI Scheme for Telecom Sector	0	0	800	-

Sources: Expenditure Budget, Union Budget 2023-24; PRS.

No spending under PLI scheme for telecom sector in first two years

In February 2021, a Production-Linked Incentive Scheme was notified to promote telecom and network products manufacturing in India, with total projected outlay of Rs 12,195 crore.^{5,6} The scheme provides incentive of 4%-6% on the incremental sale of products manufactured in India, with certain conditions also applicable for minimum investment. In 2021-22, no expenditure was registered under the scheme. Similarly, in 2022-23, no spending is expected under this scheme as per

Non-Tax Revenue from Communication Services

Communication services are one of the major sources of non-tax revenue of the central government. It includes proceeds from auction of spectrum and license fees. In 2023-24, non-tax revenue from communication services is estimated at Rs 89,469 crore, an increase of 30% over the revised estimates for 2022-23. In 2022-23, the revenue on this account is expected to be Rs 68,784 crore, 30% higher than the budget estimates. A high increase may be due to payments for spectrum auctioned in July 2022.⁷

Table 4: Non-tax revenue from communication services (Rs crore)

Year	Budget	Actual	% change from Budget to Actual	% change Year-on-Year
2017-18	44,342	32,066	-28%	-54%
2018-19	48,661	40,816	-16%	27%
2019-20	50,520	69,846	38%	71%
2020-21	1,33,027	45,501	-66%	-35%
2021-22	53,987	85,828	59%	89%
2022-23	52,806	68,784	30%	-20%
2023-24	89,469	-	-	30%

Note: Revised estimate for 2022-23 shown as actuals.

Sources: Union Budget Documents of various years; PRS.

revised estimates, although, Rs 528 crore was allocated at the budget stage last year. Rs 800 crore has been allocated to this scheme for 2023-24.

The scheme is applicable to transactions from April 1, 2021 onward.⁵ The support is to be provided for a period of five years, from 2021-22 to 2025-26. The first round of application were invited between June 2021 and July 2021.⁸ In June 2022, the scheme was amended to add a component for design-led manufacturing.⁵ Additional applications were invited for design-led manufacturing as well as others for five years commencing from April 1, 2022.⁸ They were also given an option of shifting the benefit period by one year.⁹ The second round of applications were invited between June 2022 and August 2022. In total, 42 companies have been granted approval under the scheme as of December 2022.⁹ These companies have committed investment of Rs 4,115 crore.⁹ Generation of additional sale of Rs 2.45 lakh crore and additional employment of 44,000 is expected over five years.⁹

Possible reasons for no spending

As per a media report, only three companies could meet the necessary production and investment targets for the scheme's first year, i.e., 2021-22.¹⁰ Claims were limited due to global supply chain issues affecting production and delay in launch of 5G services affecting sales.¹⁰ In the second round of applications, 22 companies availed the opportunity of shifting benefit period by one year.⁹

Table 5: Progress under the PLI Scheme for telecom and network products manufacturing as of December 31, 2022

Category	Investment (Rs crore)	Sales (Rs crore)	Employment (in number)
MSMEs	79	743	1,066
Other Domestic Companies	417	1,568	7,684
International Companies	568	9,460	2,146
Total	1,064	11,771	10,896

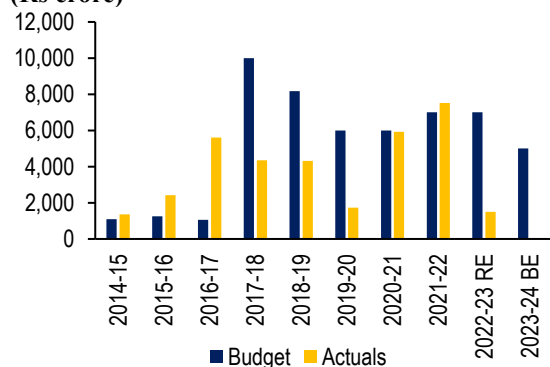
Sources: Telecom PLI Dashboard, Udyami Mitra Portal, SIDBI, as accessed on February 15, 2023; PRS.

Key infrastructure development projects see significant delays and cost escalation

Bharatnet

Bharatnet scheme was launched in 2011 with an aim to connect about 2.5 lakh gram panchayats with optical fibre network (a total of 6.5 lakh kilometre).¹¹ As per the initial approval, the scheme was to be completed within two years, i.e., by 2013.¹¹ However, the project could take off only after July 2014, which required the deadlines to be revised.¹¹ Key reasons were inadequate planning and design and lack of preparation to address implementation issues.¹¹

The project has been divided into two phases. The target for completion of Phase-I of connecting one lakh gram panchayats was set for March 2017.¹¹ Phase-I was delayed by another nine months, and was finally completed in December 2017.¹¹ The deadline for Phase-II to connect remaining gram panchayats has been moved multiple times, from March 2019 to March 2020, and then August 2021.^{11,12,13} As of January 31, 2023, optical fibre has been laid in 1.98 lakh gram panchayats, out of which 1.91 lakh have been made service ready (about 76%).¹⁴ Thus, Phase-II is not complete yet, after four years of the original deadline.

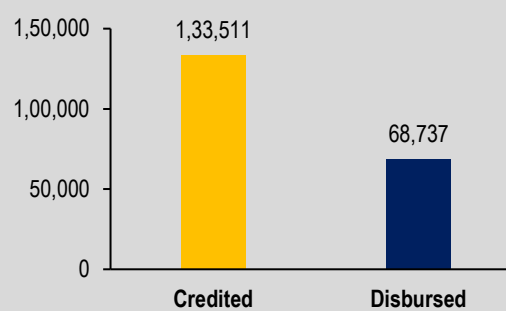
Figure 1: Expenditure towards Bharatnet (Rs crore)

Sources: Union Budget Documents of various years; PRS.

Unspent Balance in Universal Service Obligation Fund

The Universal Service Obligation Fund (USOF) has been established to provide access to communication to people in rural and remote areas.⁴ The resources for the fund are raised through a Universal Access Levy (UAL), which is 5% of the Adjusted Gross Revenue (AGR) earned by all the operators under various licenses currently.⁵ Adjusted Gross Revenue is the value of gross revenue after deduction of taxes and roaming/PSTN charges from Gross Revenue. UAL is first credited to the Consolidated Fund of India and then disbursed to the USOF as per the budgetary proposal of the Department of Telecommunications.

Over the years, the amount utilised from the funds have been considerably lower than the amount credited to it. Between 2002-03 and 2022-23 (up to October 2022), a total of Rs 1.33 lakh crore has been credited to the fund.¹⁵ Out of which, Rs 68,737 crore has been disbursed for various schemes (51%). Rs 64,774 crore remains unspent.¹⁵

Figure 2: Status of Universal Service Obligation Fund as of October 31, 2022 (amount in Rs crore)

Sources: Website of USOF as accessed on February 15, 2023; PRS.

USOF funds to be utilised for funding R&D

The schemes funded through USOF include Bharatnet and installation of towers in left-wing extremism affected areas. In October 2022, a new scheme called Telecom Technology Development Fund has been launched, to be funded from USOF.¹⁶ The scheme aims to fund research and development in rural-specific communication technology applications.

Low fund utilisation may imply persistent implementation issues

In 2022-23, at the budget stage, Rs 7,000 crore was allocated towards Bharatnet. The allocation has been decreased to Rs 1,500 crore at the revised stage, 79% lower than the budget estimate.

Scope enhanced to connect all inhabited villages

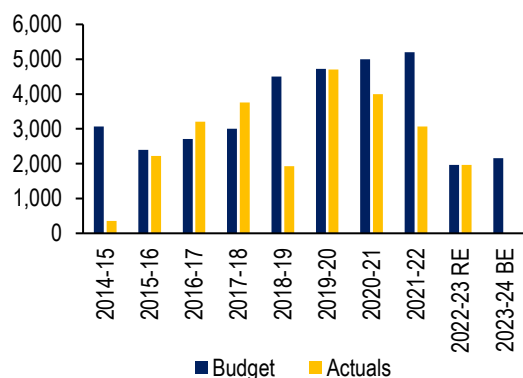
The scheme's scope has been enhanced from time-to-time. Initial scope was to make gram panchayats service ready by connecting to optical fibre network. In July 2017, the implementation strategy was revised to include last mile connectivity through wi-fi or any other suitable technology to all gram panchayats.¹¹ Last-mile connectivity is to be provided through viability gap funding in public private partnership mode.¹¹ As of January 31, 2023, wi-fi hotspot has been installed in 1.04 lakh gram panchayats, out of which only

6,285 are active.¹⁷ In June 2021, the scope was further enhanced to connect all inhabited villages beyond gram panchayats to optical fibre network by 2023.⁴

Network for Defence Services

The Network for Defence Services project aims to provide a dedicated pan-India optical fibre cable-based network for use by defence services. This project was to be completed by July 2015 and had an initial sanctioned cost of Rs 13,334 crore.¹⁸ The project cost was subsequently increased to Rs 24,664 crore.¹⁹ The revised deadline for completion was set for May 2020, further revised to December 2020.^{13,19} Funds have been allocated towards this scheme for 2023-24, implying that the scheme is still ongoing (Figure 3). As per the report of the Infrastructure and Project Monitoring Division under MoSPI, the project is anticipated to be completed by September 2023.²⁰ In 2021-22, the actual expenditure under the scheme was 41% lower than the budget estimates.

Figure 3: Expenditure towards Network for Defence Services (Rs crore)



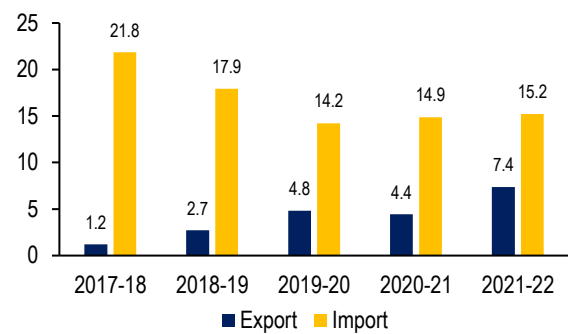
Sources: Union Budget Documents of various years; PRS.

Issues for Consideration

Import dependence for telecom instruments

In 2021-22, India's import of telecom instruments was worth USD 15.2 Billion.²¹ India also exported telecom instruments worth USD 7.4 billion.²¹ Between 2017-18 and 2021-22, exports of telecom instruments have consistently grown, whereas imports have come down (Figure 4). However, import levels are still high, with telecom instruments consistently in top-10 imported commodities by India. Further, dependence on China for telecom import also remains high. 45% of the telecom instruments by value are expected to be imported from China in 2021-22 (Figure 5).²¹ There has been concerns around continuing dependence on import for telecommunication and networking equipment. This is for both economic and security reasons.²² TRAI (2022) observed that India is not able to fully exploit the upsurge in the telecom sector.²² On one hand, the sector brings in

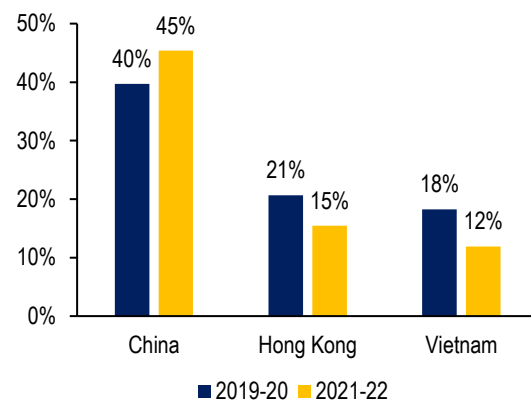
Figure 4: Export and import of telecom instruments (USD Billion)



Note: Data at the principal commodity level.

Sources: Trade Monitoring Dashboard, Ministry of Commerce and Industry; PRS.

Figure 5: Share of top three source countries in total import of telecom instruments



Sources: Monthly Bulletins on Foreign Trade Statistics, Ministry of Commerce and Industry; PRS.

foreign exchange through FDI, on the other hand, huge amount of foreign exchange is flowing out due to dependence on import.²² A huge opportunity for development of domestic manufacturing exists, with the communication sector developing at a fast pace around the world, including in India.²²

The central government has taken a number of steps in recent years for development of domestic manufacturing capacity including: (i) PLI schemes, and other schemes for capex support and interest subvention for manufacturing of telecom equipment, semiconductors, and electronic goods and components, and (ii) venture capital fund and incubation centres for startups in these sectors.²²

TRAI (2022) observed following factors as key cost disabilities for manufacturing in India: (i) cost of capital is high, with differential of about 3% as compared to developed countries, (ii) cost of essential supplies such as electricity and water to industry is higher than the normal rate in India, and (iii) high costs of compliance, testing, and certification.²² It cited a private study according to which Vietnam and China are considered 1.7 times and two times more attractive as investment

destinations than India, respectively.²² India suffers a cost disability of 7.5%-9.8%, as compared to Vietnam, and 17%-19% as compared to China for manufacturing telecom products locally.²² These occur in terms of cost of capital, power, labour, logistics, and other infrastructure.²²

As per the Department of Telecommunications, key reasons for import dependence are: (i) zero duty on import of telecom equipment as per existing tariff obligations under international treaties, (ii) low investment in research and development and creation of intellectual property rights, and (iii) lack of market access for indigenous manufacturers.²³ Imports may increase substantially with the introduction of newer technology such as 5G.²³ In her budget speech for 2023-24, the Finance Minister announced 100 labs for developing applications using 5G services.²⁴

Spectrum management

The National Digital Communications Policy, 2018 aims to develop a transparent, normative, and fair policy for spectrum assignment and allocation.²⁵ The Standing Committee on Information Technology (2021) had observed that based on the current availability of spectrum, approximately 50 MHz spectrum per operator can be ensured for 5G services. This is substantially lower than the global average (about 100 MHz).²⁶ It noted that in case of 4G too, the average spectrum per operator in India is around one-fourth of the global average.²⁶ The Committee observed that there is an urgent need for an audit of all allocated spectrum for detecting under-utilisation and subsequently rationalising the allocation of spectrum.²⁶

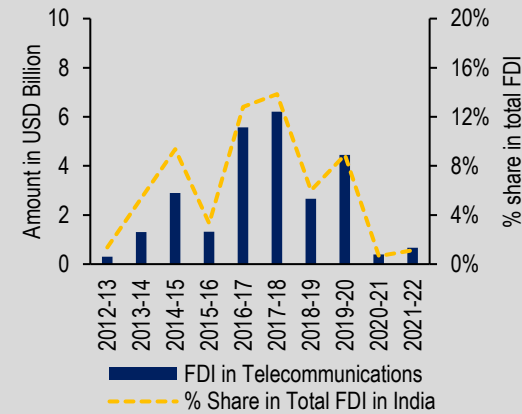
In April 2022, CAG observed certain shortcomings in the management of spectrum.²⁷ It observed that since February 2012, the Department of Telecommunications has been operating application windows for three to six months for spectrum assignment.²⁷ This ad hoc arrangement has caused uncertainty of availability of resource among government users as well as delays and denial in certain cases.²⁷ The policy for allotment of spectrum for captive usage has not been finalised. The pricing policy for captive usage has also not been reviewed, and there is no differential pricing for spectrum based on features and usage. Further, a large quantity of unutilised spectrum exists in certain bands such as 2,100 MHz and 2,300-2,400 MHz, which have huge commercial value.²⁷

It also observed the Wireless Monitoring Organisation, a field unit of the Department, did not have sufficient and updated monitoring equipment, or enforcement groups.²⁷ In October 2022, the Department released the National Frequency Allocation Plan-2022.²⁸ The plan provides a broad regulatory framework for governing use of spectrum in India.

Stagnation in FDI equity inflow

In 2020-21 and 2021-22, the telecommunication sector received FDI equity inflow of USD 392 million and USD 668 million, respectively. The share of the telecommunication sector was only 1% in the total FDI equity inflow in the country in those two years. Historically, the telecommunication sector has been the third-highest recipient of FDI equity inflow (about 7% of the total between 2000-01 and 2021-22).

Figure 6: FDI equity inflow-Telecommunication (USD Billion)



Sources: Fact sheets on FDI Statistics of various quarters, Department for Promotion of Industry and Internal Trade; PRS.

Broadband access and speed

The National Digital Communications Policy, 2018 set goals of: (i) providing universal broadband connectivity at 50 Mbps to every citizen by 2022, and (ii) one Gbps connectivity to all gram panchayats by 2020, and 10 Gbps by 2022.²⁵ Communication can be classified among broadband and narrowband based on the bandwidth required for communication. Broadband communication uses a higher bandwidth and provides better speed. TRAI (2020) had observed that in the post-COVID-19 pandemic era, there will be an increasing reliance on broadband connectivity and demand for these services is likely to grow much faster.²⁹ TRAI observed that India needs to improve in terms of access to fixed broadband as well as the speed of broadband. As of December 2020, only 9.1 out of 100 households had access to fixed broadband.^{29,30}

In India, as of September 2022, 96% of internet subscribers in India use a broadband connection.³¹ However, a broadband connection in India is defined to have a minimum download speed of two mbps (megabits per second) to an individual subscriber (revised in February 2023 from 512 kbps or kilobits per second).³² In other countries, this threshold is defined at a higher level. In USA, UK, and China, it is defined to be 25 Mbps, 24 Mbps, and 20 Mbps, respectively.²⁹ In August 2021, TRAI recommended re-defining broadband in India as: (i) basic broadband (download speed

between two Mbps and 50 Mbps), (ii) fast broadband (download speed between 50 Mbps and 300 Mbps), and (iii) super-fast broadband (download speed of more than 300 Mbps).²⁹ It recommended a direct benefit transfer scheme in those rural areas where adequate fixed-broadband capacity is available but there is a lack of demand.

TRAI observed that as per a March 2021 report by a private firm (Ookla), India experiences download speeds of 12.2 Mbps in case of mobile broadband and around 56.1 Mbps in case of fixed broadband.²⁹ The corresponding global average was 48.4 Mbps and 98.7 Mbps, respectively.²⁹ India ranked 131st among 140 nations in mobile broadband speed and 66th among 177 countries in fixed broadband speed according to this report.²⁹

Financial performance of BSNL and MTNL

BSNL and MTNL are the public sector undertakings (PSUs) engaged in providing telecommunication services in the country. BSNL and MTNL have been incurring losses continuously since 2009-10.³³ In 2019, the central government approved revival plans for both BSNL and MTNL.² The plan provided for implementation of voluntary retirement scheme, to reduce the salary expenses. As of March 2022, a total of 92,910 employees opted for the voluntary retirement scheme, which reduced salary expenditure of BSNL by about 50% and that of MTNL by about 80%.⁴ Existing high-cost debt was also re-structured through loans raised with sovereign guarantee. BSNL and MTNL raised loans of Rs 8,500 crore and 6,500 crore, respectively, with the guarantee of the central government.⁴ Under the 2019 revival plan, merger of BSNL and MTNL was also proposed, however, the same has been deferred due to financial reasons including high debt of MTNL.^{2,4}

Table 6: Financial Performance of BSNL (Rs crore)

Year	Income	Expenditure	Profit (+)/Loss (-)
2017-18	25,071	33,809	-8,738
2018-19	19,321	34,225	-14,904
2019-20	18,907	34,406	-15,500
2020-21	18,595	26,036	-7,441
2021-22	19,053	26,034	-6,982

Sources: Reports of the Standing Committee on Communication and Information Technology; Annual Reports of BSNL; PRS.

As can be seen in Table 6, BSNL's expenditure has reduced and the losses have lowered as compared to 2018-19 and 2019-20. BSNL is expected to turn profitable by 2026-27.³ As per the budget estimates, while capital infusion is estimated in BSNL to support roll out of 4G network, the same is not being extended to MTNL.

Proposed Regulatory Framework for Telecom Sector

In September 2022, the Department of Telecommunications released the Draft Indian Telecommunication Bill, 2022 for public feedback.³⁴ The Bill seeks to replace the three existing telecom laws – (i) the Indian Telegraph Act, 1885 providing for licensing of telegraph-related activities and interception of communication, (ii) the Indian Wireless Telegraphy Act, 1933 for regulation of possession of wireless telegraph apparatus, and (iii) the Telegraph Wires (Unlawful Possession) Act, 1950 for regulation of possession of telegraph wires. The Bill seeks to make telecommunication network and services licensed activities. Notably, the Bill includes internet-based communication services within the ambit of telecommunication services. This implies that OTT-communication services such as WhatsApp and Zoom could be subject to licensing. The Bill also seeks to provide: (i) legislative backing to spectrum assignment through administrative allocation and auction, (ii) right to way for laying telecommunication infrastructure, and (iii) a framework for interception of communication and suspension of services.

In December 2022, TRAI released a consultation paper on convergence in telecommunication and broadcasting technologies.³⁵ TRAI observed that currently, at the technology level, one general-purpose network can serve all types of services – telecom, broadcasting, and IT-enabled services. Such convergence is also happening at the service level, as services are network agnostic, and media types and formats and protocols around them are becoming the same. For instance, telephone and broadband services are being offered using the cable television network. Similarly, telecom service providers offer IPTV (internet-based television services), video, and music streaming services. However, at the statutory, licensing, and regulatory levels, these are still treated distinctly. Presently, there are different Acts, guidelines, and licenses applicable for providing these services. This requires permissions from different ministries and oversight from different regulators. This poses a challenge for coordination, increases costs and infuses delays.³⁵

Neither BSNL nor MTNL have seen any considerable improvement in revenue so far. The income of MTNL has seen a decline as compared to income levels observed in 2017-18 and 2018-19.

Table 7: Financial Performance of MTNL (Rs crore)

Year	Income	Expenditure	Profit (+)/Loss (-)
2017-18	3,116	6,090	-2,974
2018-19	2,606	5,997	-3,391
2019-20	2,227	5,923	-3,696
2020-21	1,788	4,251	-2,462
2021-22	1,697	4,299	-2,603

Sources: Reports of the Standing Committee on Communication and Information Technology, Annual Reports of MTNL; PRS.

- ¹ Demand No. 13, Expenditure Budget, Department of Telecommunications, Union Budget 2023-24, <https://www.indiabudget.gov.in/doc/eb/sbe13.pdf>.
- ² “Union Cabinet approves revival plan of BSNL and MTNL and in-principle merger of the two”, Press Information Bureau, Union Cabinet, October 23, 2019, <https://pib.gov.in/PressReleasePage.aspx?PRID=1588848>.
- ³ “Cabinet approves revival package of BSNL amounting to Rs 1.64 Lakh Cr.”, Press Information Bureau, Union Cabinet, July 27, 2022, <https://www.pib.gov.in/PressReleasePage.aspx?PRID=1845422>.
- ⁴ “32nd Report: Demands for Grants (2022-23): Department of Telecommunications”, Standing Committee on Communication and Information Technology, March 2022, https://loksabhadocs.nic.in/Isscommittee/Communications%20and%20Information%20Technology/17_Communications_and_Information_Technology_32.pdf.
- ⁵ “PLI Scheme amended to facilitate Design-Led Manufacturing with additional incentive rate of 1% over and above existing incentive rates”, Press Information Bureau, Department of Telecommunications, June 20, 2022, <https://www.pib.gov.in/PressReleasePage.aspx?PRID=1835560>.
- ⁶ File No 13-01/2020-IC, Ministry of Communications, June 3, 2021, <https://dot.gov.in/sites/default/files/PLI%20Scheme%20Guidelines%20for%20Telecom%20%26%20Networking%20Product.pdf?download=1>.
- ⁷ “Year End Review 2022: Ministry of Communications”, Press Information Bureau, Ministry of Communications, December 16, 2022, <https://pib.gov.in/PressReleasePage.aspx?PRID=1884072>.
- ⁸ Answer to Unstarred Question No 2302, Department of Telecommunications, December 21, 2022, <https://pqals.nic.in/annex/1710/AU2302.pdf>.
- ⁹ “DoT extends PLI Scheme for Telecom and Networking Products to 42 beneficiaries with a total committed Outlay of Rs. 4,115 crore”, Press Information Bureau, Ministry of Communications, October 31, 2022, <https://pib.gov.in/PressReleasePage.aspx?PRID=1872271>.
- ¹⁰ “Three telecom equipment companies file claims for subsidies under PLI scheme for FY22”, The Hindu Business Line, December 23, 2022, <https://www.thehindubusinessline.com/info-tech/three-telecom-equipment-companies-file-claims-for-subsidies-under-telecom-manufacturing-pli-for-fy21-22/article66297971.ece>.
- ¹¹ “50th Report: Progress of Implementation of Bharatnet”, Standing Committee on Information Technology, August 2018, https://loksabhadocs.nic.in/Isscommittee/Communications%20and%20Information%20Technology/16_Information_Technology_50.pdf.
- ¹² Unstarred Question No 621, Rajya Sabha, Ministry of Communications, June 27, 2019, <https://164.100.158.235/question/annex/249/Au621.pdf>.
- ¹³ “6th Report: Demand for Grants (2020-21) of Department of Communications (Ministry of Communications), Standing Committee on Information Technology, March 2020, https://loksabhadocs.nic.in/Isscommittee/Communications%20and%20Information%20Technology/17_Information_Technology_6.pdf.
- ¹⁴ Bharatnet Status, Website of Bharat Broadband Network Limited as accessed on February 16, 2023, <https://web.archive.org/web/20230217021624/https://bbnl.nic.in/BharatNet.pdf>.
- ¹⁵ “Fund Status”, Website of Universal Service Obligation Fund as accessed on February 15, 2023, <https://usof.gov.in/fund-status>.
- ¹⁶ “Universal Service Obligation Fund (USOF) launches Telecom Technology Development Fund scheme”, Press Information Bureau, Ministry of Communications, October 1, 2022, <https://pib.gov.in/PressReleasePage.aspx?PRID=1864133>.
- ¹⁷ Bharatnet Usage Data, Website of Bharat Broadband Network Limited as accessed on February 16, 2023, <https://web.archive.org/web/20230217021705/https://bbnl.nic.in/usage2.pdf>.
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