



HOW 5G &



DIGITALIZATION WILL RESHAPE
Indian Telecom

SEPTEMBER- 2025



its inception, the sector has undergone remarkable transformation – from basic landline services to widespread mobile connectivity and high-speed internet access. At present, it is the foundation of India's digital ecosystem, fuelling economic growth, driving innovation, transforming industries and enhancing the quality of life. Fueled by advancements in technology and supportive government policies, the sector continues to expand its reach and capabilities, playing a crucial role in shaping India's digital future. Initiatives like Digital India and BharatNet, supported by the telecom industry, are connecting remote villages, empowering local governance, and providing access to services like telemedicine, online education, and digital banking. This widespread connectivity has not only improved the quality of life for millions but also laid the foundation for inclusive economic development.

With one of the world's largest and fastest-growing mobile subscriber bases, India has emerged as a global hub for digital consumption. The affordability of mobile data, driven by intense market competition and innovation, has led to a surge in digital entrepreneurship, e-governance, fintech solutions and content creation. Key players in the Indian telecom market include Reliance Jio, Bharti Airtel and Vodafone Idea (Vi). The sector is regulated by the Telecom Regulatory Authority of India (TRAI), which ensures fair practices, consumer protection, and healthy competition. However, the industry faces challenges like high debt levels, spectrum costs, and price wars. Despite facing multiple challenges, the sector is well positioned to lead India into a fully digital future, with strong regulatory support, technological advancement, and continued investment.

TELECOM CUSTOMERS IN INDIA

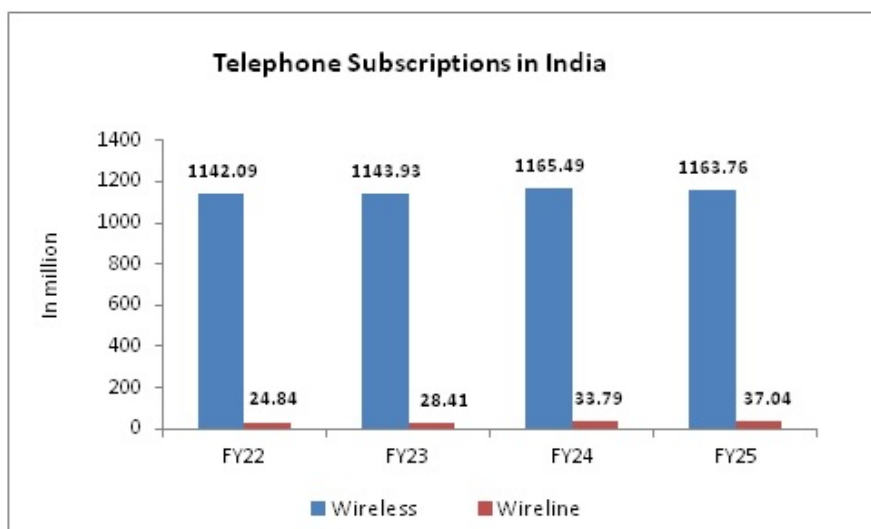
The total number of telephone subscribers in India surged from 1,199.28 million at the end of March 2024 to 1,200.80 million at the end of March 2025, registering growth of 0.13%. Out of total 1,200.80 million telephone subscribers, the number of Wireless (Mobile+5G FWA) telephone subscribers stood at 1,163.76 million at the end of March 2025, as against 1165.49 million at the end of March 2024, reporting decline of 0.15%. However, the number of wireline telephone subscribers rose 9.62% to 37.04 million at the end of March 2025 as against 33.79 million at the end of March 2024.

Even if wireless voice users saw a slight drop, the overall telecom subscriber base in FY25 increased due to robust expansion in wireline subscriptions, driven by Fibre-to-the-Home (FTTH) deployments and demand for home and enterprise broadband. This also reflects growing demand for high-speed, reliable internet, particularly among urban households and businesses. There was a dip in wireless voice users due to SIM consolidation – consumers reducing multiple SIM usage after tariff hikes.

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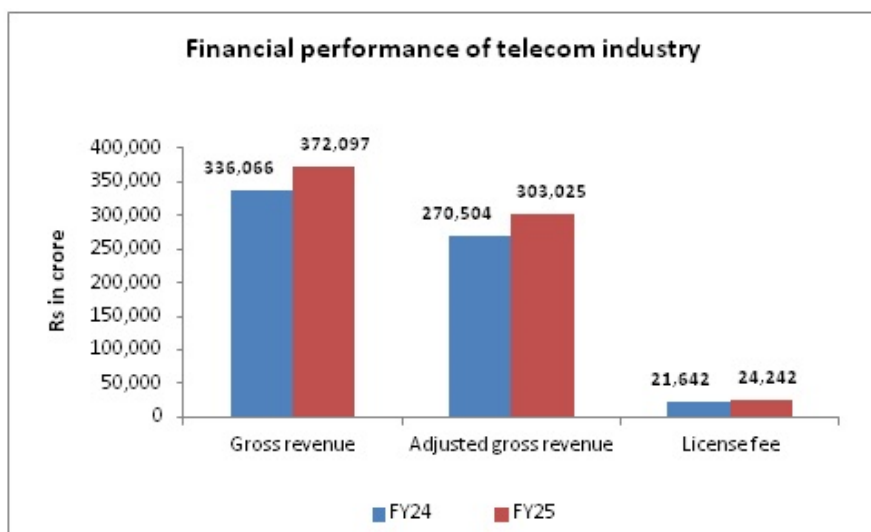
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FINANCIAL PERFORMANCE OF TELECOM INDUSTRY

India's telecom industry demonstrated robust financial performance, marked by significant revenue growth across various segments. The sector's gross revenue (GR) increased 10.72% from Rs 3,36,066 crore in the financial year 2023-24 (FY24) to Rs 3,72,097 crore in the financial year 2024-25 (FY25) and applicable gross revenue (ApGR) rose 10.26% from Rs 3,23,142 crore in FY24 to Rs 3,56,283 crore in FY25. Adjusted Gross Revenue (AGR) also increased from Rs 2,70,504 crore in FY24 to Rs 3,03,025 crore in FY25, with growth rate of 12.02%.

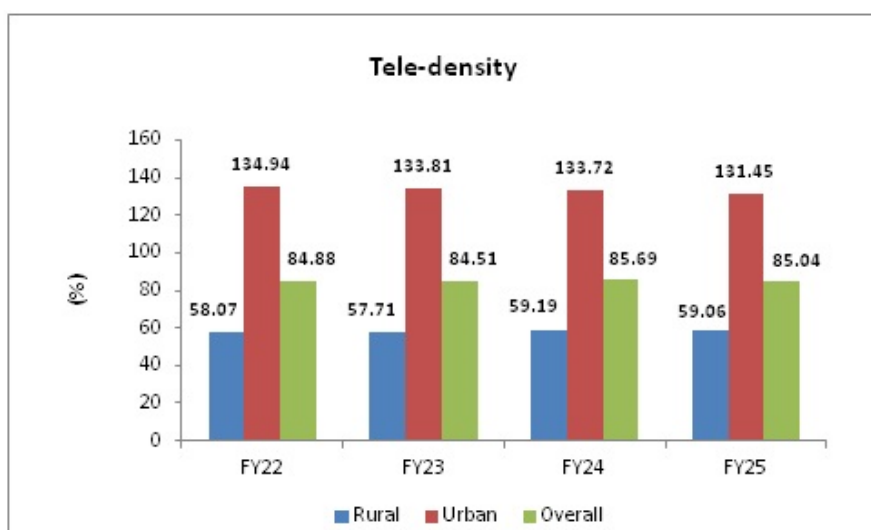
Besides, pass through charges decreased by 1.31% from Rs 53,579 crore in the year 2023-24 to Rs 52,879 crore in the year 2024-25. Pass-through charges as a percentage of gross revenue are 14.21% in 2024-25 as against 15.94% in the previous financial year. Further, spectrum usage charges (SUC) increased by 13.02% from Rs 3,369 crore in the year 2023-24 to Rs 3,807 crore in the year 2024- 25 and license fee also increased by 12.02% from Rs 21,642 crore to Rs 24,242 crore during the same period.



TELE-DENSITY IN INDIA

Tele-density is a critical metric used to assess the penetration of telecommunication services within a country. It is a key indicator of a country's communication infrastructure, digital readiness, and economic development. A higher tele-density typically correlates with better access to information, education, healthcare, and digital services. It also enables the growth of digital payment systems, e-commerce, and remote work opportunities. Therefore, tele-density plays a vital role in bridging the digital divide and ensuring inclusive growth. As of financial year 2024-25, India's overall tele-density stood at 85.04%, indicating a significant reach of telephone connectivity across the country, although with substantial variation between urban and rural areas.

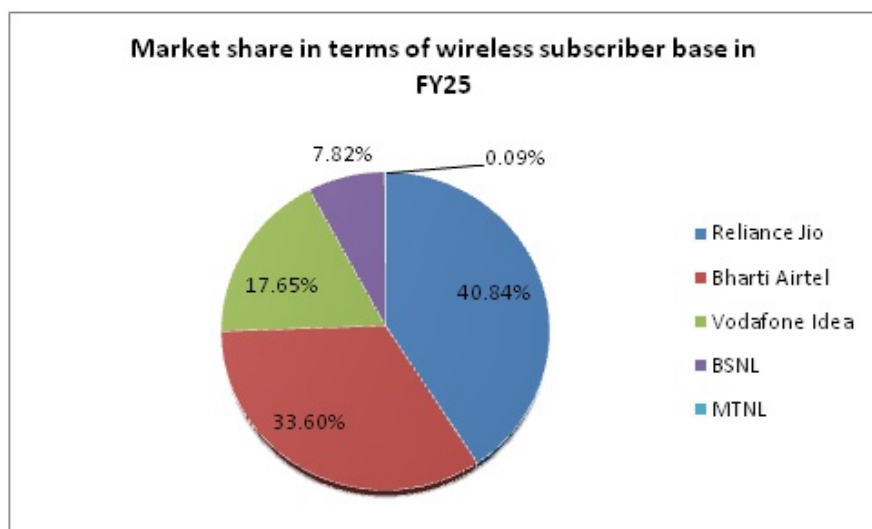
In FY25, the urban tele-density reached an impressive 131.45%, meaning that on average, there were more telephone connections than people in urban areas. This is attributed to the widespread use of multiple SIM cards, smartphones, and landlines among individuals, often for personal and professional use. On the other hand, rural tele-density was recorded at a modest 59.06%, highlighting a persistent gap in telecom penetration between urban and rural regions. This urban-rural divide reflects broader socioeconomic inequalities and suggests that a significant portion of India's rural population still lacks consistent access to basic communication services.



MARKET SHARE IN TERMS OF WIRELESS SUBSCRIBER BASE

India's wireless telecom industry is a vibrant, rapidly evolving industry that plays a central role in connecting over a billion people. Presently, the market is largely consolidated among three private players - Reliance Jio, Bharti Airtel, and Vodafone Idea (Vi) - along with two public sector undertakings (PSUs), Bharat Sanchar Nigam (BSNL) and Mahanagar Telephone Nigam (MTNL). The future of the industry lies in the widespread adoption of 5G, the rollout of Internet of Things (IoT) applications, and digital services integration. With government support, policy reforms, and increased investments in infrastructure, the telecom operators in India are poised to remain a critical driver of economic growth and technological innovation.

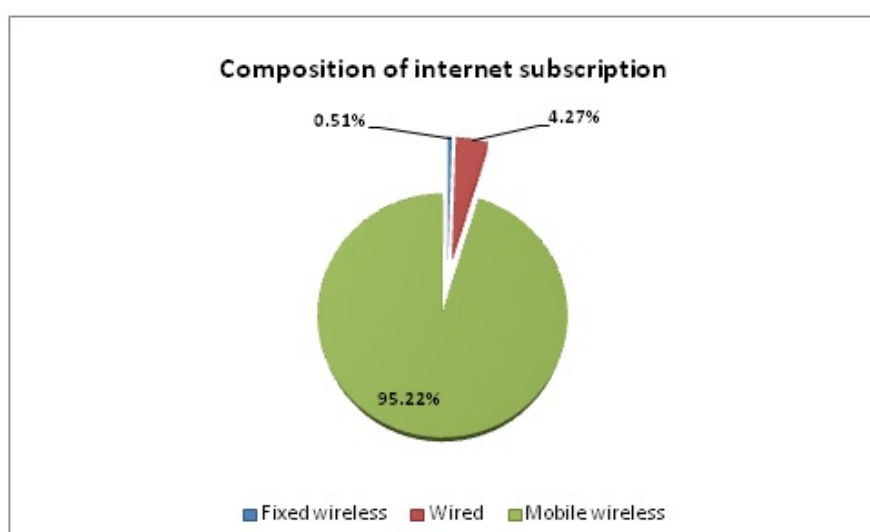
As on March 31, 2025, the three private service providers held 92.09% market share of the wireless subscribers whereas BSNL and MTNL, the two PSU service providers, had a market share of only 7.91%. Reliance Jio continued to be the market leader with 40.84% market share of total wireless telephone subscriber base at the end of March 2025 followed by Bharti Airtel with 33.60% market share. The third largest telecom operator Vodafone Idea had a market share of 17.65%. BSNL and MTNL had 7.82% and 0.09% market share respectively at the end of March 2025. In terms of net addition, Reliance Jio added maximum number of telephone subscribers of 5.60 million during the year 2024-25 and its yearly growth rate recorded at 1.19% during the year 2024-25.



INTERNET SERVICES

The telecom sector is undergoing a major transformation, shifting from traditional voice services to being the backbone of the digital economy. At the center of this shift lies internet connectivity. The number of internet subscribers is a key performance indicator for telecom companies, as it signifies not only user base expansion but also the growing demand for data-driven services such as video streaming, digital payments, online education, e-commerce, and social networking. Internet services - especially mobile data - are now the important source of revenue for most telecom operators, as prepaid and postpaid mobile plans are priced based on data limits. Besides, wired internet services provided by telecom operators in India are also a core component of the country's digital infrastructure. With Fiber-to-the-Home (FTTH) becoming the gold standard for home and business connectivity, telecom companies are investing heavily to expand their fiber footprint.

Total number of internet subscribers increased from 954.40 million at the end of March 2024 to 969.10 million at the end of March 2025, higher by 1.54%. Out of a total of 969.10 million internet subscribers, wireless internet subscribers surged 1.48% from 914.13 million at the end of March 2024 to 927.70 million at the end of March 2025. In wireless, 922.80 million were mobile wireless subscribers (Handset/Dongle based), while 4.90 million subscribers belong to Fixed Wireless (FWA-5G, Wi-Fi, Wi-Max, Radio, Satellite). More than 95% of total internet subscribers use wireless mobile technology to access internet services. Further, wired internet subscribers also rose 2.83% from 40.27 million at the end of March 2024 to 41.41 million at the end of March 2025.



FTTH FUELING TELECOM GROWTH, ENABLING DIGITAL INDIA

In the rapidly evolving digital landscape, connectivity has become the backbone of modern economies, societies, and governance. At the heart of this transformation lies the telecom sector, which plays a central role in enabling access to digital services. Among the various technologies driving this connectivity revolution, FTTH has emerged as the gold standard for delivering high-speed, reliable, and scalable internet. Recognizing the rising demand for robust digital infrastructure, leading telecom operators like Reliance Jio, Bharti Airtel and BSNL are deploying large-scale FTTH networks to penetrate deeper into urban, semi-urban, and even rural markets. Government-backed initiatives like BharatNet are also playing a key role in expanding fiber access to underserved regions, promoting digital inclusion.

FTTH has emerged as a game-changing technology in the global telecom landscape, as it offers unparalleled internet speed, stability and scalability, delivering fibre-optic connectivity directly to homes and enterprises. For Indian telecom sector, this technology is not just a service enhancement but a strategic enabler of growth, innovation, and long-term competitiveness. One of the benefits of FTTH for the telecom sector lies in its potential to drive higher revenues. Moreover, FTTH enables telecom companies to offer bundled services such as Internet Protocol television (IPTV), Voice over Internet Protocol (VoIP), cloud storage and Over-The-Top (OTT) subscriptions. These value-added services not only generate additional income but also strengthen customer loyalty. Furthermore, FTTH allows telecom companies to cater to small and medium enterprises (SMEs) and home offices with reliable and high-speed internet, unlocking new business-to-business (B2B) revenue streams.

5G: ELEVATING EXPERIENCES, ELEVATING EARNINGS OF TELCOS

In the telecom industry, average revenue per user (ARPU) is one of the most critical metrics used to measure profitability and financial performance. Over the past decade, ARPU has been under pressure globally – especially in price-sensitive markets like India, where intense competition, data price wars and limited service differentiation pushed ARPU to unsustainable lows. However, the deployment and commercialization of 5G technology has emerged as a powerful enabler for ARPU recovery and growth. Unlike previous generations 3G and 4G, 5G offers more than just faster speeds. It is not only a technological upgrade but also a revenue transformation tool for the telecom industry. By enabling premium pricing, diversified services, enterprise offerings, and high engagement, it helps telecom operators boost average revenue per user across consumer and business segments.

From unlocking new revenue streams and driving digital transformation to improving network efficiency and enhancing customer experience, 5G will offer telecom operators a roadmap to sustained growth and innovation. 5G will play a pivotal role in nationwide digital inclusion, smart infrastructure development, and economic growth. Operators who strategically invest in 5G capabilities and ecosystem partnerships will be well-positioned to lead the future of connectivity. Moreover, the 5G customer base is expected to grow, largely influenced by the affordability of 5G-enabled smart phones and continued handset replacement cycle. Offering of unlimited 5G services through various plans allows customers to experience high-speed data. This will further encourage upgrades and play a vital role in shaping the future trajectory of customers and data usage.

EMERGING TREND: 6G NETWORK

Telecom sector is a continuously evolving sector with high technological obsolescence. It has seen transformation from wire-line to mobile services, which has become lifeline of the people. Mobile services have also seen transformation from 2G to 3G to 4G to 5G and now 6G is in horizon. Though commercial deployment is still several years away, 6G is fast becoming an emerging trend, driving research, innovation, policy development and early-stage investment. Currently, the 6G technology is under development phase at international level and is expected to be available by 2030. India has already started investing in 6G research and development. Research, standardization, and spectrum allocation efforts are underway to ensure a smooth transition to the 6G era.

Government has released Bharat 6G Vision Document in March 2023 with the objectives to design, develop and deploy 6G network technologies that provide ubiquitous intelligent and secure connectivity for high quality living experience for the world to position India as a global leader in 6G technology by 2030. The Government has taken various initiatives to facilitate the development of 6G technology in the country including funding two testbeds namely 6G THz Testbed & Advance Optical Communication Test Bed to promote R&D and innovation in the country; sanctioned 100 5G labs at academic institutions in FY 2023-24, across India for capacity building & for building a 6G ready academic and start-up ecosystem in the country; and to accelerate Research for 6G ecosystem, 111 research proposals have been approved on 6G network ecosystems to promote research and innovation in line with global roadmap for 6G technology.

Apart from this, the government has facilitated setting up of 'Bharat 6G Alliance' which is an alliance of domestic industry, academia, national research institutions and standards organisations to develop action plan according to the Bharat 6G Vision. It has signed MoU with leading global 6G alliances to enhance global collaborations for the development of 6G wireless technologies. It has also hosted the inaugural International 6G Symposium coinciding with WTSA 2024 and the India Mobile Congress (IMC) 2024. The symposium aimed to explore local and global advancements in 6G technology, bringing together industry leaders, academics, and government officials.

As India embarks on this exciting journey towards the 6G era, Indian telecom operators are also at the forefront of driving 6G innovations. With strong government backing, increasing industry involvement, and a robust academic ecosystem, India is well-positioned to be a major contributor in the global 6G race. The 6G revolution is set to transform the telecommunications landscape in India, opening up a world of possibilities. With its unparalleled speed, near-zero latency, and massive connectivity, 6G will enable a plethora of innovative use cases and applications. From immersive experiences to smart cities and industries, 6G is expected to redefine the way people live, work, and interact.

RECENT DEVELOPMENTS AND INITIATIVES

TRAI strengthens consumer protection with amendments to TCCCPR, 2018

The Telecom Regulatory Authority of India (TRAI) has amended the Telecom Commercial Communications Customer Preference Regulations (TCCCPR), 2018 to further strengthen consumer protection against Unsolicited Commercial Communication (UCC). The revised regulations aim to deal with evolving methods of misuse of telecom resource and promote a more transparent commercial communication ecosystem for consumers.

Since its implementation, TCCCPR-2018 has made breakthrough use of technology for spam control through blockchain-based regulatory framework. Despite the robust measures in place, spammers have evolved their tactics, necessitating further regulatory enhancements to safeguard consumer interests. Accordingly, TRAI issued a Consultation Paper (CP) on the Review of the TCCCPR 2018 on August 28, 2024 to seek stakeholders' views on key regulatory amendments needed to enhance consumer protection and curb Unsolicited Commercial Communications (UCC). The consultation focused on several vital issues, including redefining commercial communication categories, strengthening consumer complaint redressal mechanisms, tightening the threshold norms for action against UCC, bringing in higher accountability of senders and telemarketers, curbing the misuse of 10-digit numbers for telemarketing, implementing stricter measures against unregistered telemarketers (UTMs), etc.

5G AND 6G DEVELOPMENT PROJECTS UNDER TELECOM TECHNOLOGY DEVELOPMENT FUND

A total 110 projects related to 5G and 6G amounting to Rs 304.70 crore have been approved under Telecom Technology Development Fund (TTDF) scheme till June 30, 2025. The duration of these R&D projects ranges from 1 to 5 years. These projects are currently in the initial stages of development. For 5G and 6G advancements, TTDF scheme is supporting various technological domain funding involving government & private institutions, MSMEs, start-ups etc.

Telecom Technology Development Fund Scheme was launched on October 1, 2022. The scheme aims to fund Research and Development (R&D) and innovation in telecom technologies, fostering collaboration between academia, start-ups, MSMEs, research institutes, and industry to enhance the telecom ecosystem in India.

TELECOM SERVICES IN HILLY AREAS

With an aim to improve telecom infrastructure in the hilly areas across the country, the Government is implementing various projects under Digital Bharat Nidhi such as (i) 4G Saturation project to provide 4G mobile services in uncovered villages across the country, (ii) Border Out Posts (BoP)/Border Intelligence Posts (BIP) project for the provision of 4G based mobile services at BoP/BIP's, (iii) Schemes for providing mobile services in Left Wing Extremism (LWE) affected areas, (iv) Scheme for providing mobile services in Aspirational Districts, (v) Comprehensive Telecom Development Plan (CTDP) for mobile connectivity in the North Eastern Region (NER) to provide mobile coverage in uncovered villages and along the National Highways, and (vi) BharatNet project which is being implemented in a phased manner to provide broadband connectivity to all the Gram Panchayats (GPs) and villages on demand in the country.

TELECOM SERVICE PROVIDERS PUBLISH MOBILE NETWORK COVERAGE MAP ON THEIR WEBSITES

In a significant move to enhance transparency and empower mobile subscribers, Telecom Service Providers (TSPs) have published mobile network coverage maps on their websites, as per the mandate given by the Telecom Regulatory Authority of India (TRAI).

The newly introduced coverage maps offer a variety of user-friendly features for easy accessibility and navigation with standard color scheme. It also provides the option to see the coverage of specific technology like 2G, 3G, 4G or 5G offered by respective TSP in their area of interest. Users can use search options or enable location on their device to navigate to their current location. The toggle switch or technology selection button may be used to select coverage maps of technology of their interest i.e. 2G/3G/4G/5G etc.

The mobile network coverage maps are not only useful for subscribers but also provide status of telecom coverage across the country which can be used by different stakeholders for planning and rollout of e-enabled initiatives. These maps may also be used for data driven evaluation of requirements of any regulatory or policy intervention.

OUTLOOK

The outlook of the Indian telecom industry seems positive, with the shift towards 5G and premium plans, rising data consumption and demand for digital services. The improving financial performance along with declining capital expenditure (capex) intensity of leading players after completion of 5G rollout is expected to improve free cash flow and support the sector's overall credit profiles. In addition to tariff hikes, telecom operators have been strategically rebalancing their service offerings to push users toward higher-value plans. Specifically, they have been phasing out low-data prepaid plans and restricting access to 5G services to only those users who subscribe to plans with higher data limits. As a result, this trend is expected to move consumers to premium plans, boosting telco ARPU.

The tele-density will see rise in coming years, on the back of India's rapid digital transformation, liberalization of the telecom sector and government initiatives like Digital India and BharatNet, which aim to connect the remotest parts of the country. The affordability of smartphones and data plans, coupled with the expansion of 4G and now 5G networks, will help boost mobile subscriptions significantly. Besides, low rural tele-density offers a strategic growth opportunity for the Indian telecom sector, allowing companies to expand their subscriber base, introduce new services and build lasting relationships in an underserved market. Enhancement of tele-density equitably across regions will not only improve communication, but will also empower citizens and accelerate India's journey toward becoming a digitally inclusive economy.

In urban areas, data consumption beyond mobility will be driven by an increase in connected home devices, connected automobiles and other Internet of things applications, further giving boost to both wireless and wireline broadband subscriptions. Consequently, higher data consumption will lead to better average revenue per user. As internet usage continues to grow, wired broadband – especially FTTH – will remain essential for providing fast, stable, and scalable internet access to India's growing digital population. However, the balancing profitability with affordability, ensuring regulatory clarity, managing spectrum and infrastructure costs, and innovating service offerings will be essential for the telecom sector to fully achieve its potential.

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