

TV RAMACHANDRAN



FIXED BROADBAND: THE UNMATCHED BACKBONE OF A DIGITAL ECONOMY

In a mobile-first world, FBB still delivers unmatched quality and greater capacity at lower costs, making it indispensable for India’s digital growth ambitions

India’s emergence as a mobile-first nation is undeniable. With mobile broadband (MBB) reaching 65% penetration (TRAI July 2024), it is easy to see why some believe India does not need fixed broadband and mobile connectivity is enough to meet the nation’s digital demands. However, this thinking overlooks two critical aspects: the explosive growth in data consumption and the limitations of mobile networks.

Globally, countries are investing in optic fibre-based fixed broadband (FBB) to significantly increase data usage. A glance at comparable nations reveals the stark difference between their mobile and fixed broadband landscapes and that of India (see *Comparative Data on Mobile and Fixed Broadband*).

As the data illustrates, India lags in fixed broadband penetration compared to other nations. Countries like Japan, Sweden, and the United States boast much higher FBB penetration, correlating with their higher data consumption.

BROADBAND SPEEDS: A COMPARISON OF GLOBAL STANDARDS

India’s broadband speed standards are relatively low, with a minimum of 2 Mbps. In comparison, other nations have set much higher minimum speed requirements, ensuring better connectivity for consumers (see *Broadband Speed Regulations Worldwide*). It is no surprise that higher broadband speeds contribute significantly to economic growth.

Comparative Data on Mobile and Fixed Broadband

Country	Mobile Phone Subscriptions in 2022 (%)	MBB in 2023 (%)	FBB* in 2023 (%)
Japan	168	108	38.55
Sweden	125	135	40.73
United States	110	100	38.05
Germany	125	99	45.38
Finland	129	115	35.33
Australia	107	124	36.41
EU	127	125	23.8
China	125	98	44.73
Brazil	99	92	22.91
Thailand	176	82	16.02
Indonesia	115	85	4.82
India#	83	64	3

* Subscriptions per 100 people; # TRAI Data, 31 July 2024; MBB = Mobile Broadband; FBB = Fixed Broadband
NOTE: The first column provides mobile subscription data and includes connections across all technologies—2G, 3G, 4G, and 5G. Hence, values in this column are generally higher than those in the second column, which reflects the number of MBB connections. For instance, over 200 million feature phones in India are still in use, and they cannot access the Internet or broadband services.
Source: World Data Bank Country Reports; TRAI.

The increasing data consumption worldwide has made it imperative for many economies to expand fibre-based FBB infrastructure.

Broadband Speed Regulations Worldwide

Country	Regulator	Minimum Download Speed	Minimum Upload Speed	Target
India	TRAI	2 Mbps	Not specified	100 Mbps as per Digital India goals
USA	FCC	25 Mbps	3 Mbps	Ongoing discussions for future increases
European Union	BEREC	30 Mbps	Not specified	100 Mbps by 2025
United Kingdom	Ofcom	30 Mbps	Not specified	50 Mbps for superfast broadband
Australia	ACMA	25 Mbps	5 Mbps	Higher speed tiers via NBN
Canada	CRTC	50 Mbps	10 Mbps	100% coverage of 50 Mbps by 2026
South Korea	KCC	100 Mbps	Not specified	Expand gigabit (1 Gbps) internet
Japan	MIC	30 Mbps	Not specified	Universal 1 Gbps in the future
Germany	Bundesnetzagentur	50 Mbps	Not specified	100% of households with 50 Mbps by 2025

THE ECONOMIC IMPERATIVE FOR FBB EXPANSION

The increasing data consumption worldwide has made it imperative for many economies to expand fibre-based FBB infrastructure. In the United States, monthly data usage per FBB connection has surged to 640 GB, and this figure is expected to reach 700 GB by the end of 2024. In Europe, the average monthly consumption has hit around 500 GB and continues to grow.

Similarly, a leading private wireline operator in India reports an average consumption of around 400 GB per connection monthly. If mobile broadband (MBB) were relied upon to handle this level of usage, it would not only fall short in terms of bandwidth but also result in prohibitively high monthly costs—estimated at over Rs 5,000 per month.

In contrast, fixed broadband offers the necessary bandwidth at a fraction of the cost. This difference arises because the mobile spectrum is continuously consumed and expensive, whereas optic fibre represents a one-time, or “sunk,” cost that remains in place for many years. At a

recent Broadband Summit in Delhi, a senior government official highlighted that while mobile broadband costs around Rs 10 per GB, fixed broadband reduces the cost to as low as Rs 1-2 per GB. The substantial cost savings for consumers and businesses make fixed broadband an economically attractive option.

Countries such as South Korea, China, and the United States recognise fixed broadband's critical role in driving economic growth (see *Economic Impact of FBB on GDP and Growth*). These nations continue to expand their fibre networks, ensuring their economies remain competitive and well-prepared for the future.

India, too, is taking significant steps in this direction. Through the BharatNet initiative, the country aims to bring fibre connectivity to all 600,000 villages by 2025, as envisioned by the Prime Minister. In 2023, the central government sanctioned a substantial Rs 1.4 lakh crore for the project, which will be a cornerstone of the Viksit Bharat program. BharatNet's mission is to bridge the digital divide, especially in rural areas, by providing reliable internet access to more households.

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Economic Impact of FBB on GDP and Growth

Country	Economic Impact of FBB on GDP and Growth
South Korea	The digital economy contributes over 9% to GDP; tech sector grows at 10% annually; per capita income increased from USD 20,000 in 2007 to USD 34,000 in 2023.
China	FBB drives 6–7% GDP growth, with the digital economy accounting for 40% of overall GDP.
USA	The expansion of fibre is projected to have a USD 60 billion GDP impact by 2025; a 10% increase in broadband penetration boosts GDP by 1.38%.
Brazil	Its 0.9% annual GDP growth is linked to broadband expansion.
Japan	Gigabit Internet for smart cities and IoT, projected 1 Gbps speeds nationwide by 2025, driving innovation and smart city projects.

Technological experts widely acknowledge that while mobile communication is convenient and relatively easy to set up, it has inherent limitations. The radio waves used in mobile communication are subject to varying quality and bandwidth based on several factors, including the number of users connected to a tower, distance from the nearest tower, speed of movement, and obstructions like foliage and walls. In contrast, optic fibre offers immense bandwidth capacity coupled with extremely high consistency and reliability. Fixed broadband also delivers much lower latency—around nine milliseconds—compared to mobile broadband’s 28 milliseconds.

Developed economies understand that achieving 100% mobile broadband penetration alone is insufficient to meet the rising demands of an increasingly data-driven world. Despite widespread mobile coverage, these nations prioritise fibre connectivity because of its superior bandwidth, reliability, and scalability. Fiber-to-the-home (FTTH) is essential for supporting data-heavy applications like 4K streaming, cloud computing, smart cities, and the Internet of Things (IoT)—applications that mobile networks cannot handle as efficiently.

The focus on household penetration is critical. Unlike mobile broadband, which caters to individuals, fixed-line connections power entire homes and businesses. Shifting to this household-level understanding is key

to effective planning, ensuring broadband rollouts can accommodate the growing demand for high-speed, stable connections across multiple devices in homes, schools, and workplaces.

Today, almost all countries recognise that fibre networks are vital for future technological advancements, productivity improvements, and fostering innovation. Fibre also helps reduce network congestion and provides stable, high-speed internet access for industries and individuals. This foresight allows developed nations to maintain their competitive edge in the global digital economy.

For a digital economy like India, deploying multiple broadband technologies in a strategic, calibrated manner is essential for delivering high-quality, cost-effective broadband services nationwide. While mobile broadband will always serve as the quick and easy solution, it cannot meet the medium to heavy-duty demands that require more capacity, consistency, and quality. India must aim to increase fixed broadband availability tenfold to match the levels of comparable digital economies. 🌐

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Views are personal.

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