Fibre or 5G? Convergence may be the real superhero

Fibre brings stability and 5G adds reach, but convergence offers enterprises the most resilient path to future-ready connectivity.

BY PRATIMA HARIGUNANI

Superman flies at astonishing speeds across the sky and has X-ray vision. Spiderman, by contrast, spins webs from his wrists but manoeuvres deftly across any landscape. Superman can hear sounds from miles away in space. Spiderman is no less powerful, with his 'spidey-sense'. Both save the day – and sometimes a stranded cat on the 40th floor. Each has a weakness too – Kryptonite or ethyl chloride, a red sun or water.

Preferences often depend on whether we live in a DC or Marvel universe. Choosing between them is not easy. A similar dilemma confronts enterprises today: whether to rely on 5G or fibre for connectivity. Spectrum or physical networks – both bring superhero-like strengths. The way forward, experts argue, may lie in convergence, where 5G's reach is reinforced by fibre's reliability, with each technology leveraged for its unique advantage.

John Strand, CEO of Strand Consult, frames the debate in enterprise terms. "What we are talking about is fibre vs. 5G MBB vs. 5G FWA. The question is which infrastructure can service corporate or enterprise customers best. Different customers have different needs. In some areas, fibre competes with 5G. In others, fibre supplements 5G. In many cases, they will co-exist side by side."

Before considering convergence, it is worth weighing their strengths separately.

5G: THE SKY HERO OF CONNECTIVITY

In terms of scalability and reach, 5G is often the first

"Private 5G is no shortcut: spectrum, equipment, and expertise add heavy capex that many enterprises cannot shoulder alone."

LT GEN DR SP KOCHHAR
Director General, COAI

choice. Spectrum-based solutions such as 4G and 5G private networks offer flexibility for mobile or remote devices across industrial sites, according to Sachin Arora, Head of Connectivity and IoT at Giesecke+Devrient, India.

From a return-on-investment perspective, 5G enables faster value realisation where laying fibre is cost-prohibitive or geographically difficult, said Stan Gray, SVP IoT Broadband and High Cat Vertical Sales, Telit Cinterion. "Its wireless nature reduces upfront infrastructure investment and accelerates deployment, particularly for dispersed operations. Fibre, on the other hand, often has a longer lifespan and lower operational costs once installed, which makes it highly efficient in fixed environments."

Gray added that 5G offers mobility, rapid deployment, and the ability to support devices at scale, particularly in IoT and edge computing.

Recent industry trends reinforce this preference. Strand cited that since Telia rebranded as Norlys in May 2025, even within its fibre footprint, Norlys has prioritised 5G mobile broadband (MBB) over fibre. Fibre-only brands such as Hiper have also launched 5G MBB. Telenor, over the past two years, has consistently promoted 5G MBB to end customers before fibre. Strand said he expects the decline in fixed broadband subscriptions to have accelerated in 2025, given rising fibre BSA wholesale prices and sustained competitive pressure.

Strand believes this shift in the Danish market is driven more by economics than customer demand. "The rise in fibre wholesale prices, combined with intense competition, has left many ISPs financially strained. Service providers that own mobile networks lean towards more profitable 5G offerings."

Cost comparisons further strengthen the case for 5G. Fibre installation, particularly underground, can be expensive due to excavation and labour requirements. A report by Global Market Insights notes that laying fibre

IN BRIEF

- 5G delivers speed, mobility, and scale, making it attractive for IoT and edge cases where fibre rollout is costly or impractical.
- Fibre ensures stability, ultra-low latency, and interference immunity, ideal for mission-critical workloads and industrial operations.
- Private 5G networks require higher capex, spectrum, and skilled resources, making TSP partnerships essential for long-term efficiency.
- Fibre's mature ecosystem offers reliability, while 5G's dynamic ecosystem requires careful interoperability and security checks.
- FTTH Council says convergence can save up to 96% in rollout costs and avoid the 2–3.5× penalty of late fibre deployment for 5G.
- Hybrid fibre backbones with 5G mobility layers are emerging as the preferred connectivity model for global enterprises.

"Fibre's wired security is strong but still vulnerable to cuts, while 5G must lean on encryption, SIM authentication, and zero-trust."

SACHIN ARORA
Head – Connectivity & IoT, Giesecke+Devrient India

optic cables underground can cost up to USD 144,000 per mile in urban areas, factoring in trenching, permits, and restoration. Maintenance challenges, such as breaks and weather-related damage, add further costs. In such contexts, 5G becomes a more attractive option.

FIBRE: THE SKYSCRAPER HERO OF NETWORKS

Fibre remains the gold standard for fixed locations demanding high bandwidth and consistent performance, such as core factory operations, Arora explained.

Latency is another advantage. "Fibre provides ultra-low latency and exceptional reliability, making it suitable for mission-critical workloads. While 5G also delivers near real-time responsiveness, wireless overhead can slightly affect latency," he said.

Gray highlighted the fibre's unmatched stability, extremely high bandwidth, and immunity to spectrum interference. "It is ideal for fixed, high-demand locations where capacity is predictable."

Unused fibre capacity is often cited as a drawback. Gray explained that this usually results from over-provisioning or delayed adoption. While it represents sunk capital, it also offers a buffer for future demand. "The greater short-term risks lie with 5G, especially around security, interoperability, and early deployment challenges," he said.

On security, fibre's wired nature makes it less vulnerable to interception, though physical damage remains a risk. By contrast, 5G requires encryption, SIM-based authentication, and zero-trust design principles to counter its larger attack surface. "Enterprises must embed security from day one," Arora said.

HARNESSING THE POWER OF BOTH WORLDS

The best outcomes often lie in convergence. Just as comic book universes sometimes create hybrid heroes, enterprises can combine fibre and 5G for balance.

"Enterprises should evaluate scalability, latency, and security when choosing between spectrum-based and fibre-based connectivity," said Arora. "The decision should reflect operational needs, mobility, and performance requirements."

Gray pointed out the scalability trade-off. "5G excels in connecting millions of IoT devices, while fibre scales more in terms of bandwidth per connection. Urban enterprises may find fibre more accessible, while rural regions may leapfrog directly to 5G."

Cost also weighs heavily. Lt Gen Dr SP Kochhar, Director General of the COAI, recently argued that private 5G networks entail significant capital expenditures (Capex) for equipment, spectrum, security, and skilled personnel. He said enterprises setting up private networks independently could face unexpected financial and operational burdens.

Strand cited Danish retail pricing to illustrate the swing: in some areas, fibre broadband is DKK 419/month while

"5G lowers upfront costs and speeds deployment, yet fibre proves its worth with longevity and efficiency in fixed environments."

STAN GRAY
SVP – IoT Broadband & High Cat Vertical Sales, Telit Cinterion

"Fibre and 5G are not an either-or choice; sometimes they clash, sometimes they complement, but more often they end up side by side."

JOHN STRAND
CEO, Strand Consult

5G MBB is DKK 249/month; in others, fibre is DKK 319/month against 5G MBB at DKK 249/month. Where fibre pricing is sharper, the uptake balance shifts accordingly.

Vendor ecosystems also influence choices. Fibre has a mature, proven ecosystem with well-defined service-level agreements. 5G, though more dynamic, involves collaboration across telcos, cloud providers, and equipment vendors. This brings innovation but requires careful checks on interoperability and security, Gray said.

Kochhar added that enterprises often underestimate the operational challenge. Unlike telecom service providers (TSPs), most enterprises lack the expertise and scale to manage networks effectively. "With continuous evolution of both technology and ecosystem, frequent upgrades will be necessary, and TSPs are best placed to anticipate and implement them," he said.

Regulation and geography add further complexity. Fibre deployments often face right-of-way and zoning hurdles, while 5G depends on spectrum licensing, which varies across markets. Geography often dictates outcomes: dense urban centres justify fibre's Capex, while remote or mobile-heavy areas benefit from 5G.

A FORK IN THE ROAD OR ON THE ENTERPRISE PLATE

When weighing fibre against 5G, enterprises should view them not as substitutes but as complementary solutions, Gray argued. "The decision is less about choosing one over the other and more about aligning each with business needs. A manufacturing plant may benefit from fibre's reliability, while a logistics network tracking thousands of moving assets may need 5G."

Hybrid architectures that combine fibre backbones with 5G mobility layers are gaining traction. A study by the Fibre to the Home (FTTH) Council highlights the value of reusing existing fibre networks to support future 5G rollouts. Reusing FTTH infrastructure can reduce 5G network costs by up to 22%.

According to FTTH Council Europe's paper on optimising FTTH networks for convergence, high-band 5G (24–40 GHz) can deliver very high capacity but struggles with building penetration and attenuates quickly over distance. That reality necessitates dense small-cell deployments anchored on fibre backhaul.

Vincent Garnier, Director General, FTTH Council Europe, noted that 5G requires high antenna density, which in turn demands a fibre transport network. "The FTTH Council has been exploring synergies between FTTH and 5G deployments," he said.

The FTTH Council also notes that without early convergence, fibre built later for 5G can cost 2–3.5× more. Conversely, an optimally converged FTTH-and-5G design can remove roughly 65–96% of the cost of a standalone fibre network for 5G.

Strand said it is wrong to frame the issue as 5G vs fibre. "Many fibre players are extending fibre with 5G fixed wireless access (FWA) to lower broadband rollout costs. In countries such as India, 5G FWA is widely viewed as a cost-effective way to extend high-speed Internet access, and it is seeing strong uptake in the USA, Brazil and large parts of Africa."

Security remains central to any decision. Gray cautioned that 5G IoT deployments must embed resilience into design, with strong collaboration across vendors, operators, and device makers.

The choice between fibre and 5G, therefore, is not binary. Capex vs latency, reach vs security, control vs bandwidth – these are trade-offs. The solution lies in designing for flexibility and convergence. For enterprises, it may not be a question of Superman or Spiderman, but of Batman: defined not by powers but by decisions. As Batman said, "It is not who I am underneath, but what I do that defines me."

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