



Image source: iStock

Telecom Infrastructure: The Invisible Force Behind Our Connected World

“Creativity is just connecting things.”

Steve Jobs

Maggie Cheng, CFA, CAIA

Senior Fixed Income Analyst

The Backbone of Modern Connectivity

Life is all about connections. Telecom infrastructure is an invisible force that keeps us together, even when we are apart. It makes connections and creativity possible day and night. Social media platforms rely on telecom towers and data centres to function effectively, their infrastructure helps us reduce the feelings of loneliness and isolation.

For investors, telecom infrastructure companies have been the core holding with credit portfolio, owning to their highly resilient business models and favourable customer contracts that safeguard against cost inflation. Throughout the pandemic, these companies have maintained or improved their credit profile, providing investors a sense of security. Investors can have peace of mind across all stages of economic cycles.

Within the connectivity ecosystem, the roles of telecom towers and data centres are distinct yet equally significant.

I. The Vital Role of Telecom Towers and Data Centres in Daily Life

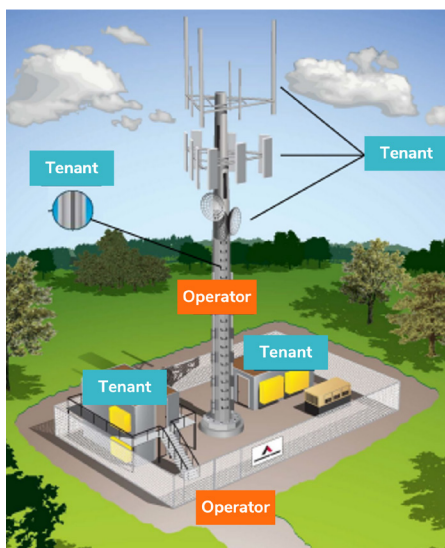
A video call with a loved one, a quick text to a friend, or even sharing a laugh through social media—these simple acts of communication are powered by telecom towers. With approximately 1.7 million telecom towers worldwide, these structures play a crucial role in connectivity by transmitting and receiving radio signals.

Telecom towers are instrumental in supporting e-learning platforms, online courses, and virtual classrooms, making education accessible to all. They support businesses by providing reliable communication and data transfer, ensuring business continuity through secure data storage, efficient data retrieval and disaster recovery solutions.

Low Technology and Inflation Risks

Telecom tower owners and operators lease out the tower structures – constructed of galvanized steel with the capacity for multiple tenants – and the land parcels in long-term leases. Tenants bring their own antenna equipment, base-station equipment, ventilation and air-conditioning systems (Chart 1). This business model offers low technology and inflation risks, making it attractive to telecom tower investors.

Chart 1 – Telecom Tower Structure



Source : American Towers

Tenants, predominantly telecom companies and TV broadcasting companies, shoulder the risk of technology obsolescence of their equipment. Telecom companies typically allocate over 15% of their total revenue to maintenance and capital investments, whereas tower operators incur significantly less capital expenditure in these areas. This difference gives tower operators greater flexibility to reduce financial leverage and manage interest burdens, especially amidst rising interest rates.

Tower lease payments are designed to align with rising costs, being indexed to inflation and including cost pass-through mechanisms. Tower operators either bill their customers directly for the electricity used by their equipment or distribute the electricity costs proportionally based on each tenant's equipment and power consumption when multiple tenants share a tower. This indexing and cost pass-through significantly safeguard the profitability of tower owners. Consequently, tower owners consistently enjoy higher operating profits compared to their tenants, telecom companies.

As a critical component of the digital infrastructure, telecom towers have proven high business resilience over the economic cycles. Their revenue streams were unshaken throughout the pandemic and the global financial crisis in 2008-09. Switching costs for their customers are high, as moving equipment from one tower to another involves substantial costs in de-installation, transportation, and re-installation.

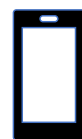
Tower lease contracts usually span long-term periods, ranging from 5 to 10 years in emerging markets, and 10-20 years, up to 30 years in developing markets. The long-term lease commitments and early termination penalties discourage frequent switching. Customers are often large with solid balance sheet, and present a low non-payment risk profile.

The Promise for the Future

Five billion people are on social media

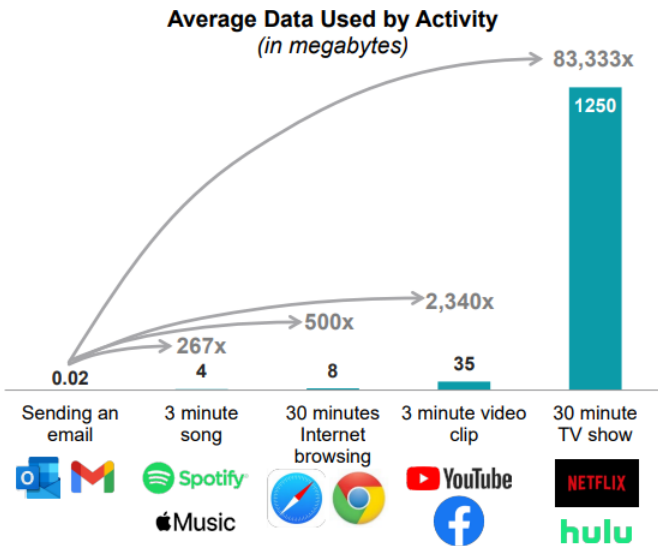


We spend 4 hours a day on our mobile



The increasing use of advanced applications and mobile data (chart 2), the densification of networks to support 5G, the IoT (Internet of Things) all require reliable data transfer by telecom towers day and night.

Chart 2

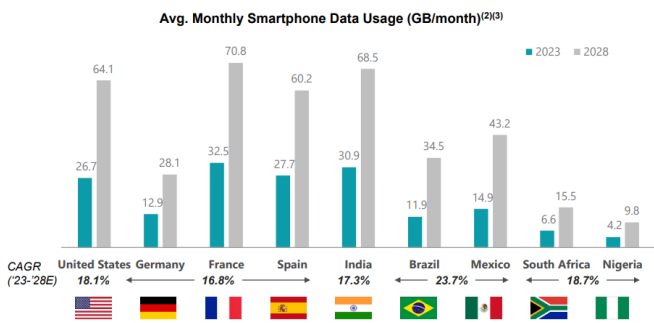


Source: Source: Altman Solon Research and Analysis, Verizon, AT&T

The rising availability of affordable smartphones in emerging markets is set to significantly boost mobile data usage worldwide. For example, the JioPhone Next, offering advanced features at a price of just \$86 in India, exemplifies this trend. Over the next five years, data usage from smartphone is expected to more than double in both developed and developing countries (chart 3).

Telecom towers play an important role in facilitating access to information and educational resources, particularly for underprivileged families. Our vision is a world where access to information is universal, and telecom towers are instrumental in reducing inequality by making this vision a reality.

Chart 3



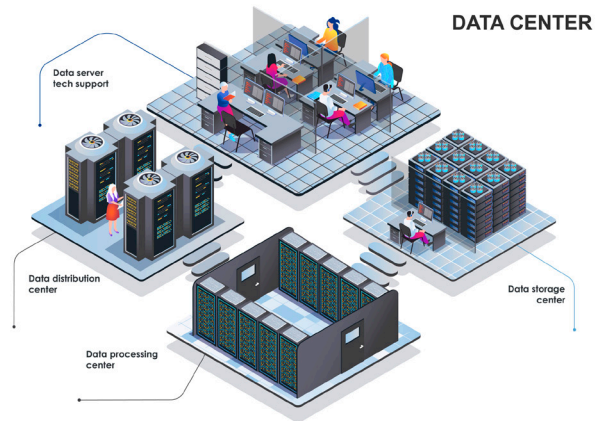
Source : Ericsson Mobility Report

Telecom Tower business is scalable. Revenue growth is also supported by co-location, a multi-tenanting strategy, where two to three tenants share the same tower infrastructure. Accommodating three tenants on a single tower can potentially double the gross margin for the tower operator. The costs associated with building and maintaining a tower are relatively fixed, and spreading these costs across multiple tenants enhances overall cost efficiency. As the number of tenants increases, the per-tenant maintenance cost decreases. Regulators support co-location, ensuring independent tower operators maintain neutrality between telecom companies, facilitating fair access to data transfer.

II. Data Centres: The Essential of Our Digital Age

While telecom tower operators provide the infrastructure for real-time communication, data centres act as the nerve centres of the digital age. They are a centralised location for data storage, management, and dissemination (chart 4).

Chart 4 – Data Centre Structure



Data centre operators lease out space and provides network capacity, power and cooling equipment. Tenants bring their own servers and IT equipment, bearing the technology risks associated with their hardware. Customer contracts are comprehensive, including provisions for passing through costs in electricity, cooling, maintenance, network connectivity and disaster recovery.

From social media, video streaming to email, data centres process and store the vast amounts of data that enables people to unwind, enjoy shared experiences, and bond over common interests (chart 5).

Chart 5 – How We Consume Data



The applications in natural language processing, computer vision and machine learning will escalate the demand for data centre solutions in hosting a vast number of servers. Educational content and professional resources, from online courses to webinars, will foster continuous learning and professional growth.

NIVIDA has partnered with a data centre, allowing the data centre’s customers to own NVIDIA DGX supercomputing and software worldwide, managed by the data centre platform (DGX: deep learning GPU training system).

High Customer Loyalty

Similar to telecom towers, data centres benefit from long-term contracts with high switching costs for customers who need reliable data storage and management solutions.

There is a misconception that hyperscale providers compete with traditional data centres. Hyperscale providers offer vast, scalable cloud computing services, while traditional data centre operators complement them by offering colocation services for hybrid cloud deployments.

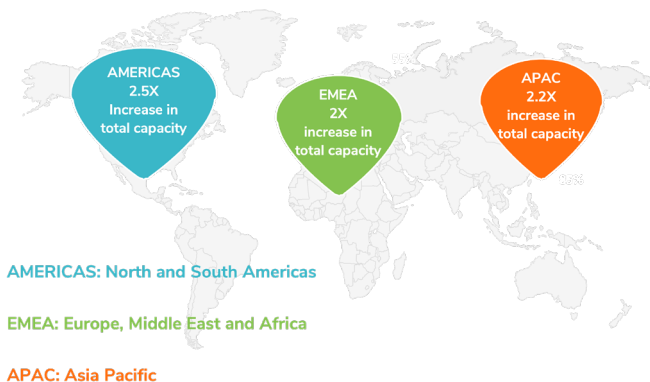
Data centre customers include hyperscale cloud providers, large corporates, and global banks. The partnership between hyperscale and traditional data centre operators offers direct connectivity, enables secure and efficient connections between on-premises infrastructure and cloud environments for end-customers. And very often, it is more cost efficient for hyperscale providers to rent space from traditional data centre operators for customised service and proximity to end-customers.

During the pandemic, demand for data centres surged as remote work became the norm, followed by a brief slowdown in 2021-2022. Prior to the advent of ChatGPT and the rise of generative Artificial Intelligence (AI), data centre demand was closely tied to the economic growth, the capital expenditure cycle of technology companies, and the need for cloud services. However, with the widespread adoption of generative AI, the growth in data centres has shifted from a cyclical trend to a structural trend, underscoring the critical role of data centres in our AI age.

The Expanding Horizon of Data Centres

With over 8,000 data centres currently operational worldwide, the demand for these critical infrastructures is set to multiply. According to Cushman & Wakefield, a global real estate research provider, the total capacity of data centres needs to double with current pipelines (Chart 6). This expansion is essential to host powerful servers required for processing and cloud services, in supporting generative AI and the digital ecosystem.

Chart 6 – Capacity Growth of Data Centres with Current Development Pipeline



Source: [Cushman & Wakefield](#)

Navigating the Challenges

Telecom industry consolidation can present challenges for tower operators, such as the potential decommissioning of redundant tower sites following a merger between two telecom companies. However, such mergers also created opportunities for new leases and infrastructure upgrades, notably with the accelerated rollout of 5G technology and the commitment to expand network coverage. These developments can offer long-term growth and stability for tower operators.

“ AI Data Centres Won't Run On Hopes And Dreams. ”

Sam Altman

Data centres need investments in hardware, energy, cooling systems, and skilled personnel. Data centres will need to deliver substantial electrical power and support advanced servers and cooling system required for running artificial intelligence applications.

Some older data centres were designed for lower power densities to accommodate traditional computing workloads. However, AI applications demand more powerful hardware such as GPUs (Graphics Processing Units), which consume significantly more power than conventional servers.

According to estimates by the International Energy Agency, a single ChatGPT query requires 2.9 watt-hours of electricity, which is nearly ten times the 0.3 watt-hours needed for a Google search.

The AI-powered processors also generate substantial amounts of heat, necessitating cooling systems in data centres that can handle these dense heat loads efficiently. This cooling process typically involves cold plates, pumps, radiators, and reservoirs, to transfer heat from processors to a liquid coolant, which then dissipates the heat away from the hardware. Choosing the right cooling system depends on specific requirements for heat density, energy efficiency, and space constraints.

In addition, geographical considerations play a crucial role in selecting the locations. For instance, Madrid has emerged as an ideal hub for data centres, due to its well-developed fiber-optic network and the city being increasingly powered by renewable energy sources. West Virginia in the U.S. has attracted many data centre operators because of its low incidence of natural disasters, various tax incentives, and rich energy resources, particularly in natural gas.

Conclusion

The contribution of telecom towers and data centres goes beyond the technical aspects of connectivity. These infrastructures bridge distances, ensure real time communication during natural disasters, facilitate personal growth and learning, and support business stability. They are the invisible hands that enable us to access diverse sources of inspiration and joy. Investors could take part in the investment journey while being assured of the high business resilience and positive impacts on the connected world for future generation.

“ Connecting everyone in the world is one of the greatest challenges of our generation. ”

Mark Zuckerberg

For further information

Banque Syz SA

Quai des Bergues 1
CH-1201 Geneva
Tel +41 58 799 10 00
syzgroup.com

Maggie Cheng, CFA, CAIA

Senior Fixed Income Analyst
maggie.cheng@syzgroup.com

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