



OPPORTUNITY

50

SCOPE TRANSITIONAL

UNCERTAINTIES

Collaboration, Technology

MEGATRENDS

Borderless World - Fluid Economics

TRENDS

Advanced Connectivity
Artificial intelligence
International Collaboration
Mobilising Innovation
Space economy

SECTORS IMPACTED

Agriculture & Food
Automotive, Aerospace & Aviation
Chemicals & Petrochemicals
Communication Technologies & Systems
Consumer Goods, Services & Retail
Cyber & Information Security
Data Science, AI & Machine Learning
Digital Goods & Services
Education
Energy, Oil, Gas & Renewables
Financial Services & Investment
Government Services
Health & Healthcare
Immersive Technologies
Infrastructure & Construction
Insurance & Reinsurance
Logistics, Shipping & Freight
Manufacturing
Materials & Biotechnology
Art, Media & Entertainment
Metals & Mining
Professional Services
Real Estate
Sports
Travel & Tourism
Utilities

What if we had a global, seamless internet?

THE NETWORK OF NETWORKS

Advances in satellites and advanced machine intelligence enable seamless, global internet access, supporting the internet of things (IoT) and reducing network disruptions through intelligent transitions between cellular and satellite networks.





WHY IT MATTERS TODAY

Today, 95% of the world's population has access to mobile broadband of 3G or above, but geographic disparities underlie this figure; for example, while 88% of the global population have 4G coverage, only 50% of the population on the African continent have access to 4G.¹⁰⁰⁵ Moreover, as the world transitions to 5G, legacy networks like 3G are often switched off to free-up space for 5G.¹⁰⁰⁶ While standards have not yet been set for 6G, speeds are expected to be 10 to 1,000 times faster than current 5G.¹⁰⁰⁷ While 5G networks theoretically offer speeds up to 10 gigabits per second (Gbps), real-world tests show it could be 1.4 to 14 times faster than 4G, up to 20 Gbps.¹⁰⁰⁸ Doubling the broadband speed for an economy increases gross domestic product (GDP) by 0.3%.¹⁰⁰⁹ By 2029, 5G will account for 76% of mobile data traffic, i.e. triple the 2023 levels.¹⁰¹⁰

While satellite internet speeds have, historically, been slow, connection speeds have jumped from 0.08 megabits per second (Mbps) in 1997¹⁰¹¹ to upwards of 200 Mbps today.¹⁰¹² While altitude limits may vary, satellites in low Earth orbit (600–1200 km above the Earth)¹⁰¹³ have been the most popular, those in very low Earth orbit (some 350 km above the Earth) can provide 6G access and bring real-time, more reliable, more cost-effective internet.¹⁰¹⁴ At 530 km above the Earth, the TeraByte InfraRed Delivery system of NASA and Massachusetts Institute of Technology (MIT) (and others) recorded laser transmission at 200 Gbps per second, i.e. over 2 terabytes in 5 minutes, or 1,000 high-definition movies.¹⁰¹⁵

Satellite internet continues to gain traction worldwide, with the global satellite industry expected to be worth over \$500 billion in 2024.¹⁰¹⁶ SpaceX's Starlink is the world's largest satellite internet provider¹⁰¹⁷ with just over 4,500 active Starlink satellites,¹⁰¹⁸ with lifespans of around five years each.¹⁰¹⁹



**6G speeds are
expected to be**

10 to 1,000

**times faster than
current 5G**



OPPORTUNITY

Advances in satellite technology and communications result in higher data speeds, lower costs, and lower latencies.¹⁰²⁰ The integration of 5G and 6G cellular networks with satellite internet would provide unrestricted internet access, facilitating unprecedented levels of collaboration in work, life, and digital realities around the world and accommodating the growing needs of both users who increasingly rely on autonomous vehicles and other devices and technological advances, including the IoT, edge computing, quantum computing (QC), and others. Regardless of on-the-ground connectivity, network disruptions could become a thing of the past as, through advanced machine intelligence and automation, one network seamlessly takes over when the other fails.¹⁰²¹

BENEFITS

Communications are both universal and optimised for sustainability and connectivity. As connectivity becomes borderless, new lifestyle and problem-solving opportunities emerge. Digital realities, autonomous mobility, energy, smart cities, and remote surgeries (telesurgery) become highly reliable as the risk of disconnection is extremely low.

RISKS

Implementing and maintaining satellite internet is expensive, both in terms of hardware and functioning speed. The complexity of allocating costs per user could lead to access restrictions due to intricate user charging mechanisms that may or may not be monopolised by specific operators. An increasing number of satellites limit further launches as space debris becomes a significant issue.

