



The New Space Race: How Satellite Operators and Telcos Must Work Together

There's a lot going on in space today: new satellite mega-constellations are springing up in multiple orbits, high-throughput satellites (HTS) have been launched into the skies, and SpaceX, OneWeb and Amazon are planning huge rollouts of satellites in a low Earth orbit (LEO) over the coming years. In light of such moves, it's possible that space may completely transform the global connectivity landscape.

Amid this transformation, there are also major growth opportunities for telecommunications companies (telcos) and satellite operators as technologies such as 5G, edge computing and the Internet of Things (IoT) become mainstream. But telcos and satellite operators will need to work together in this emerging "space race" to maximize its potential.

Satellite operators in particular should consider leveraging the extensive internet protocol (IP) networks that telcos already have, and their other terrestrial assets and customer relationships worldwide. Those companies that can combine assets from both worlds – space and terrestrial – stand to benefit the most in the market.

So what does the future hold? And what steps do they need to take together to capitalize on this new frontier? In this white paper, we will discuss the emergence of the new space race, and outline how satellite operators and telcos should be thinking about working together to achieve success.

How the new space race emerged

[In the 1960s, satellites started launching into a geosynchronous orbit \(GEO\)](#) around 36,000km (22,000 miles) above Earth. Due to their high cost

and latency, they were traditionally used for a limited range of applications, such as in communications and emergency services in remote areas, long-distance backhaul, maritime and military services, and extractive industries (oil, gas and mining).

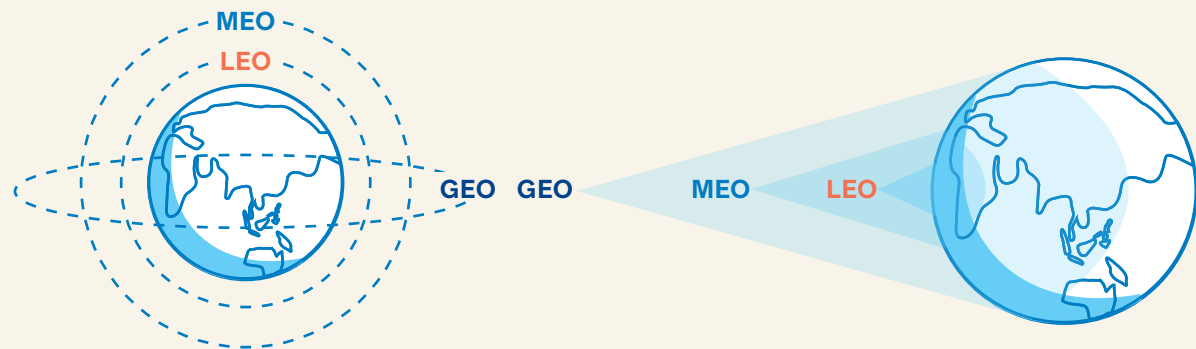
However, since the 2010s, more satellites have been launched in lower orbits, including medium Earth orbit (MEO) and low Earth orbit (LEO). One of the early entrants in this burgeoning space sector was SES subsidiary O3b Networks, which [began in 2013 to launch MEO satellites](#) to an [altitude of 8,000km](#) (about 5,000 miles). This approach to satellite communications and technology decreased the costs for manufacturing, launch and maintenance. In turn, because these satellites were orbiting closer to Earth, latency became less and less of an issue.

As satellite technology has gained further traction over the past decade, it has prompted more innovation in the industry's value chain. This has led to the development of high-throughput satellites (HTS) and swarms of LEO satellites (which sit at an altitude from hundreds to a couple of thousand kilometers), making the technology accessible to a wider range of companies and an increasing number of applications, including edge computing, IoT and more.



Orbital Patterns

Orbital Altitude and Coverage



LEO

Low Earth Orbit

Altitude: 160-2,000km
Speed: ~8km/sec
Orbital Period: ~90 min

Example:
Globalstar - 48 satellites
Voice and Data Services

MEO

Medium Earth Orbit

Altitude: 2,000-35,786km
Speed: ~3-8km/sec
Orbital Period: ~2-24 hours

Example:
GPS - 24 satellites
Global Positioning Systems

GEO

Geostationary Orbit

Altitude: 35,786km
Speed: ~3/sec
Orbital Period: 24 hours

Example:
Communications satellites, Broadcast satellites

Many of the world's best-known entrepreneurs have recognized the potential of such innovations in satellite technology, essentially kicking off a new space race centered on these advances. With ambitious plans, they are keen to stake their claim as the pacesetters. Here are some of the major players:

- **SpaceX:** the Elon Musk-led company has plans for the largest LEO constellation via its Starlink fleet. It could potentially roll out a staggering [42,000 satellites, having already put well over 1,000 small satellites in space](#) and with [plans for 12,000 by 2026](#).
- **Amazon:** the Jeff Bezos-founded company is [investing more than \\$10 billion](#) to ultimately launch more than 3,200 satellites in its LEO constellation.
- **OneWeb:** acquired last year by Bharti Global and the UK government, OneWeb has launched [more than 250 LEO satellites in its planned fleet of 648](#), with the aim of going global next year through its [wholesale model](#).

While the use of satellite technology for remote communications services is still a big part of the industry, other opportunities are arising. As prices and latency drop, satellite services are becoming much more competitive with and complementary to terrestrial telecommunications offerings such as those provided by subsea cable systems.

In addition, satellite services have become more enticing to a variety of companies and industries due to: 1) hugely increased bandwidth capacity demands on existing terrestrial networks; 2) the increasing requirement for always-on communication; and 3) a vastly widening set of use cases as 5G starts to take hold around the world.

For these reasons, this new space race may create some tension between the traditional telcos and satellite operators; but, for now, it makes the most sense for the players involved to see it as a symbiotic relationship in which the two sides will need each other.

What's in it for satellite operators?

While new satellite operators may be eager to disrupt the communications sector by harnessing the recent space-based advances – especially since [only half of households worldwide have access to fixed broadband](#) – these technologies are still fairly nascent and barriers remain. That's where telcos come in, offering multiple incentives for major players that seek to team up with them. Let's take a deeper dive into this.

Existing terrestrial infrastructure and the people to maintain it

A key telco-based advantage comes down to the existing terrestrial assets that they own and have already spent decades building up – including [fiber networks](#), [IP backbones](#), [satellite teleports](#) (for some telcos such as Telstra) and [data centers](#). This presents a massive opportunity for satellite operators.

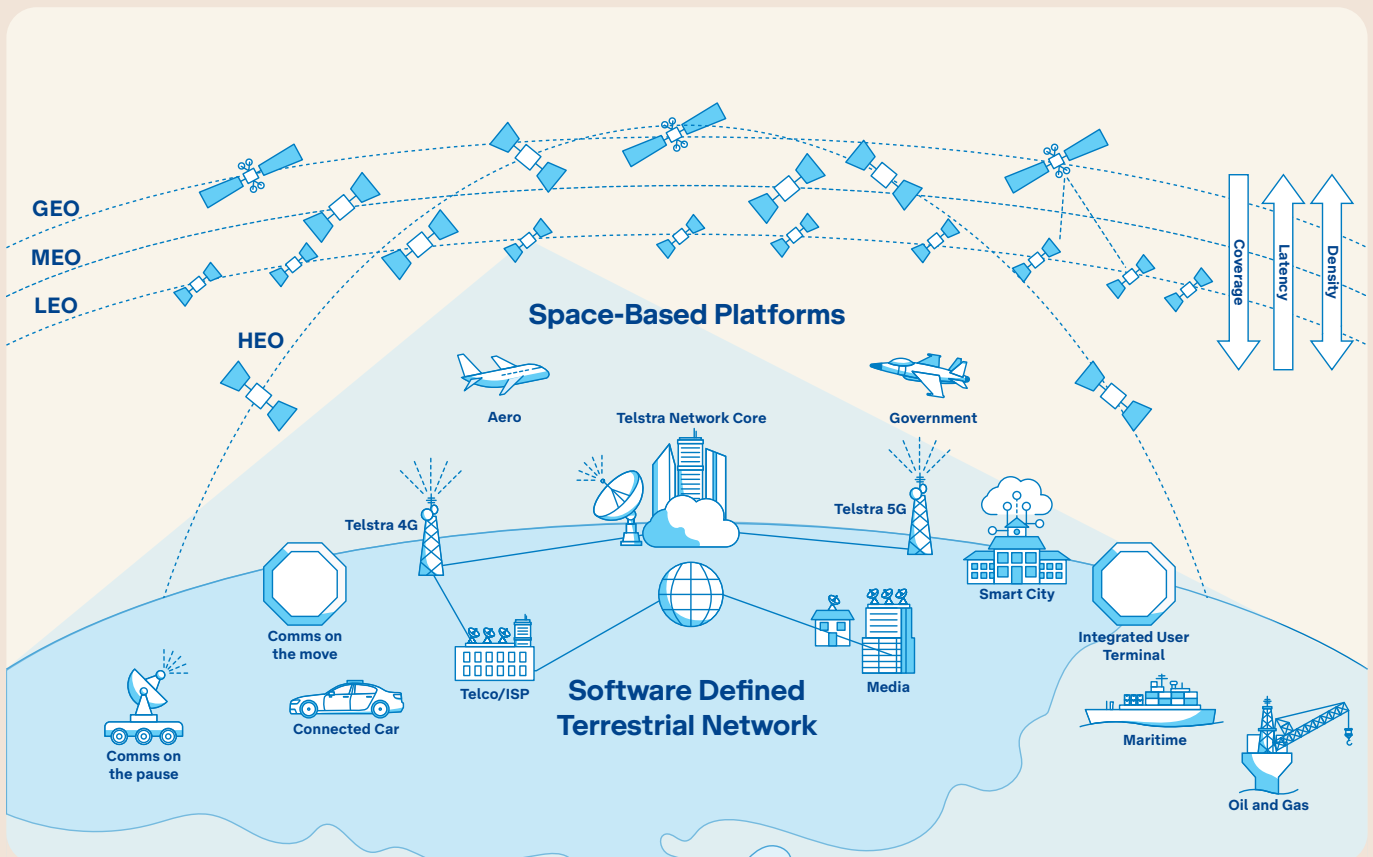
These terrestrial networks have enabled telcos to meet increasing bandwidth demands, which have skyrocketed in the past 18 months due to booms in streaming services, gaming, esports and cloud, among other factors. They are already a tried and true method for distributing data and content around the world; and, for satellite operators, they can open up efficient, adaptive and flexible transmission pathways to businesses and consumers.

For example, take the production and distribution of global live sporting events such as the America's Cup, UFC Fight Island and the FIFA World Cup, which are highly demand-driven and require one-off spikes in network capacity when they're happening. While this is absolutely a use case in which satellite technology can continue to play a large role in the future, telcos' terrestrial networks may help fill in the gaps and offer cost efficiencies.

Additionally, there are geographies like that of the Philippines, which has thousands of islands and where it makes sense to use satellite technology and terrestrial networks together to reach businesses and consumers.

By partnering with one or more telcos, satellite operators can also reduce the cost of and need for additional personnel required to develop, install, and maintain terrestrial infrastructure over the long term. For example, [Telstra](#) is one global telco that offers existing satellite services and ground station equipment (teleports), with a specialist team of people to support it.

Although MEO and LEO deployments have different requirements to GEO ones – such as a need for tracking antennas and a higher number of more distributed teleports – co-locating at facilities already owned by an existing company can be a big draw for new providers seeking to establish early points of presence in a market as a faster, lower-cost point of entry than building facilities themselves.



Stanley Teleport, Hong Kong



Telstra also has one of the [largest terrestrial and subsea networks](#) in the world that can carry data from satellites directly to businesses. For some satellite operators, the experience in owning and managing teleports, as well as the terrestrial networks they connect to, should not be overlooked.

Regulatory and local expertise in dozens of countries and territories

For satellite operators looking to ramp up a global presence quickly (who isn't?), they may encounter major regulatory setbacks if they don't have existing relationships with local governments or a presence on the ground in the countries where they plan to do business.

When the need is considered to potentially repeat this in multiple different territories, it is likely to be even more complex – particularly when many locations that have the most pressing need for satellite communications are the same ones where the challenge is greatest.

Some telcos may own licenses or may already meet regulatory requirements in dozens of countries worldwide, which may make it easier for satellite companies to begin or sustain operations in those areas. Additionally, telcos have decades of experience and also have workforces on the ground in these countries with local expertise that can prove invaluable for satellite operators.

Existing partnerships with large enterprises and major content providers

The new wave of satellite companies and some of their technologies are still fairly nascent, at least in terms of the use cases for the technology, the content and data distribution they support, and the major businesses using their technology to deliver services to consumers. Not so for telcos, which have already established themselves with large enterprises and international governments, and are working with them to send and receive huge amounts of information and content around the world.

Telcos have built up relationships with a plethora of over-the-top (OTT) companies such as Facebook and Netflix, content delivery networks (CDNs) like Cloudflare and Fastly, and cloud players such as Google and Microsoft. This is something that some satellite operators can currently lack, so working with a telco may be imperative for opening up joint ventures and establishing a foothold with large enterprises and content providers.

Investment in new technologies and value-added services that can benefit satellite operators

New satellite operators could still find a way forward without the benefits of existing terrestrial networks, regulatory expertise and current relationships with major brands. However, partnerships with telcos can still provide value in terms of scaling up, adding services quickly, and offering new technologies and services such as software-defined networking, virtualization and MPLS that lie on top of the core network, and in which telcos have invested heavily over the past few years.

Benefits for telcos of working with satellite operators

We've discussed the benefits for satellite operators, but now let's consider the benefits for telcos.

Scaling up new services and technologies

It's no secret that telcos have invested heavily in their terrestrial networks and carry on doing so. For example, Telstra continues to invest significantly in adding bandwidth capacity to its existing trans-Pacific and intra-Asia subsea cable systems, as well as its network across Australia. This is mainly to meet an increasing demand for fiber networks and internet as new technologies like 5G and others become used by more businesses and people worldwide.

Building up terrestrial networks and scaling these technologies takes time, but can be complemented by working with satellite operators. For telcos, LEO satellite technology presents opportunities for a wide array of use cases, including backhaul for 5G, autonomous vehicles, industrial offshore applications, sensors for telemedicine, maritime and disaster relief, and smart cities. An [industry prediction](#) by ABI Research suggests that about 20 million IoT connections will be made via satellite within the next five years.

Additionally, it's becoming clear that with these new LEO constellations that aim to cut costs and decrease latency compared with existing satellite services, telcos have a huge opportunity to create more dynamic and resilient global networks with sufficient redundancy.

Alternatives to building additional terrestrial fiber networks

Telcos are updating and expanding their terrestrial fiber networks all the time. While fiber is a growing industry – driven by increasing global bandwidth demands from major technology companies such as Facebook, Amazon and Google, and the expansion of industries like streaming, cloud and gaming – there's still a large portion of the world that lacks internet connectivity. In fact, [almost half of the world's population has no access to the internet, and fewer than one in five people in the least-developed countries are connected.](#)

To put it bluntly, that's because in many areas it's not economical for telcos to invest in high-speed fiber networks in remote locations, or "dead spots." But this is exactly where satellite operators can help fill in the gaps. Satellites – and LEO satellites, in particular – can offer a more cost-effective option for delivering communication services and providing coverage to these places. They can also offer an alternative even where coverage exists for technologies such as LoRaWAN, Sigfox, narrowband Internet of Things (NB-IoT) and other low-power wide-area network technologies.

So those telcos looking to expand network coverage for their business, consumer and government customers in remote regions should certainly look to partner with these up-and-coming satellite operators.



Stanley Teleport, Hong Kong

Expanding existing satellite services

Some telcos already offer their own satellite services, so what does the rise of LEO satellite constellations mean for them?

Historically, telcos used satellite for voice services. However, as telcos evolved, built out extensive fiber networks on the ground and focused more on managed services, satellite services became less relevant for some of them. Some telcos abandoned teleports and switched off services altogether, with many now procuring white-label services from other companies if they need satellite connectivity.

Yet some, like Telstra, remained invested in the [satellite](#) industry. That strategy has been paying off more recently as the new space race has taken shape and applications for [satellite technology](#) have evolved.

Telstra currently provides [teleport](#) facilities for GEO satellites, and is already working with satellite operators to support MEO satellites. The company is particularly well-positioned as a base for satellite coverage across Australia and the greater Oceania region (including New Zealand and countries in Southeast Asia). With two teleport ground stations in Australia – in Sydney and Perth – and one in Hong Kong, these provide access to more than 32 GEO satellites by more than 60 Earth station antennae, interconnected with the company's global IP transmission backbone.

With the new LEO satellite operators entering the market, there is an opportunity for telcos to expand their existing services (content delivery, fixed broadband, global internet and others) while helping satellite companies build a foundation for their own technologies. Telcos may opt to build additional teleports (or if they don't currently have them, build their own) or other infrastructure to grow with the new satellite companies, which can allow them to sell more connections and fiber backhaul. It could also make the telco a potential long-term in-country partner not only in their domestic market, but also in new markets.

The way forward

The advent of ever more HTS, LEO and MEO constellations and systems is giving rise to new connectivity models and infrastructure in the sky, as well as a host of exciting new services for the future.

For now, the new wave of satellite providers will need the telcos on the ground to provide them with fiber, IP, backhaul and a host of other services, as well as offering a much easier way to access multiple markets around the world.

By uniting and enabling networks with all the benefits of rapid, smart routing and adaptive, virtualized networks, plus capitalizing on the promise offered by 5G and IoT, players on both the ground and in space have the potential to ensure denser global coverage faster.

Telstra International

[Telstra](#) is a leading telecommunications and technology company with a proudly Australian heritage and a longstanding, growing international business that offers a platform for global connections and infinite possibilities. Today, Telstra International has over 3,000 employees based in more than 35 countries outside of Australia, providing services to thousands of business, government, carrier and OTT customers.

Over several decades we have established the largest wholly-owned subsea cable network in the Asia-Pacific, with a unique and diverse set of infrastructure that offers access to the most intra-Asia lit capacity. We empower businesses with innovative technology solutions including data and IP networks, and network application services such as managed networks, unified communications, cloud, industry solutions, integrated software applications and services. These services are underpinned by our subsea cable network, with licenses in Asia, Europe and the Americas and access to more than 2,000 Points of Presences (PoPs) in more than 200 countries and territories globally.

In July 2022 Telstra completed the acquisition of [Digicel Pacific](#), the largest mobile operator in the South Pacific region.

For more information, visit telstra.com/global.



If you're a satellite operator and would like to know more about how to partner with a telco, check out Telstra's [satellite offerings](#) or [book a meeting](#) with a Telstra representative to talk about your unique requirements.