

Satellite Executive

BRIEFING

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Industry Trends, News Analysis, Market Intelligence and Opportunities

Satellite IoT in 2026: A Two-Track Market

by Hub Urlings

Despite years of bullish forecasts and expectations built up over the last few years, satellite Internet of Things (IoT) in 2026 is still far from the transition from promise to commercial maturity. The industry is no longer dominated by marketing-induced visions of fleets of inexpensive CubeSats connecting billions of sensors across the planet. Instead, the reality is a steadily growing market for critical communications served by a handful of incumbent players. Facts speak for themselves. Around 80% of today's market remains in the hands of incumbent mobile satellite operators such as Viasat/Inmarsat, Iridium, ORBCOMM, and Globalstar.

Alongside them, however, a diverse group of challengers are pursuing new ways to capture the next phase of growth. These challengers include specialist Low-Power Global Area Networks (LPGANs) using CubeSats, operators using capacity on existing satellites, 3GPP-based Non-Terrestrial Network (NTN) providers, and companies combining terrestrial and satellite connectivity. Although still a small part of the market, these different approaches are triggering the

emergence of a broader connectivity ecosystem for satellite IoT.

Despite the fact that big expectations have not been met, the market has reached meaningful scale. Berg Insight's forecasts extrapolated a base-case estimate of around 12 million active satellite IoT terminals or subscriber connections in 2026. Connectivity revenue is approximately US\$ 0.8–1.0 Billion, while the broader ecosystem—including terminals, modules, installation, platforms, and managed services—approaches US\$ 2 Billion. Berg Insight forecasts 32.5 million satellite IoT connections by 2029. Such figures should be treated with caution, however, as is the case with all spreadsheet logic. Market definitions are not clear, ie. is Artificial Intelligence Systems (AIS) part of satellite IoT?, and, most importantly, satellite operators disclose little useful data when it comes to subscriber numbers.

A Two-Track Market

Behind the headline numbers, satellite IoT is developing on two distinct economic tracks.

The first consists of high-value,

Continued on page 4

What's Inside

From the Editor3

Trends in the IoT Market for
Satellites

by Bernardo Schneiderman8

Company Spotlights:

Es'hailSat12

Orbital Connect28

Rethinking the Value of Satellite
Broadcasting

by Adir Hadad16

Show Report: AI for Good

by Roxana Dunnette19

Product and Service
MarketPlace Guide to

IBC 202624

How Satellite IoT Can Enhance
Remote Water

by Alastair Macleod30

From Constellations to Conver-
gence: Value Beyond Coverage

by Markus Fritz33

Market Trends:

Military vs. Civil Spending

by Aiswary Pachauri39

Product Spotlight: Jonsa43

Vital Stats46

Advertisers' Index46

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The Satellite IoT Market



As summer turns to fall in the Northern hemisphere, the satellite industry events circuit starts again with a view towards the coming year's opportunities and challenges. As in previous years, this September we will be at the IBC in Amsterdam and the World Space Business Week (WSBW) in Paris. We will have a booth at IBC at Hall 1, booth # 1.C94 and we will have two reporters, including myself, covering the WSBW. We look forward to reconnecting at these events and making new friends.

The industry continues to evolve with some high profile mergers and acquisitions, the most recent of which is RocketLab's acquisition of Iridium, making it a vertically integrated company like SpaceX. As always, we are reporting these key developments in our website, www.satellitemarkets.com.

One of the hottest markets for satellites, surpassed only by the broadband access market, is the market for Internet of Things (IoT). Depending on the source, the total market for IoT can be from 80-100 million units, of which satellites are projected to have 20 to 30% market share. To shed light on this important and potentially lucrative market, we have several articles in this issue covering this important topic led off by our cover story by Hub Urlings, a pioneer in Satellite IoT and a feature by our correspondent Bernardo Schneiderman going deeper into the prospects and key market segments for IoT. In addition we have a case study on an IoT satellite application for water resource management.

Enjoy the issue and hope to see you at the IBC in Amsterdam or WSBW in Paris.

Virgil Labrador

Editor-in-Chief

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COVER STORY

Satellite IoT Market 2026... from page 1

mission-critical communications for defense, maritime operations, energy, utilities, mining, trucking, and heavy industry. Customers in these sectors require reliable communications regardless of location, particularly where terrestrial infrastructure is unavailable, unreliable, or cannot be trusted. Global coverage, security, service continuity, and long equipment lifecycles are more important than achieving the lowest possible price per connection.

The second track addresses potentially much larger numbers of devices but at much lower average revenue per user. Environmental monitoring, agriculture, livestock management, logistics, asset tracking, and eventually consumer applications could generate tens of millions of connections. Yet these markets become economically attractive only when terminals are inexpensive, power consumption is extremely low, and satellite connectivity can be integrated almost invisibly into existing IoT solutions.

This distinction helps explain the continuing strength of the incumbent operators. Iridium (just recently acquired by RocketLab), Viasat/Inmarsat, Globalstar (acquired by Amazon LEO), and ORBCOMM possess advantages that new entrants cannot easily reproduce: operational global networks, spectrum rights, mature hardware ecosystems, installed customer bases, distribution networks, and decades-long relationships with industrial and government customers.

Nor are these incumbents standing still technologically.

Iridium provides a particularly good example. In June 2026, it introduces the Iridium 9604, combining

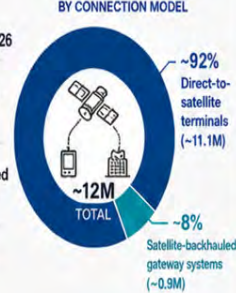
Satellite IoT Market 2026

One-page snapshot of the market, operators, segments, and outlook

1 MARKET AT A GLANCE



2026 TERMINALS MIX BY CONNECTION MODEL

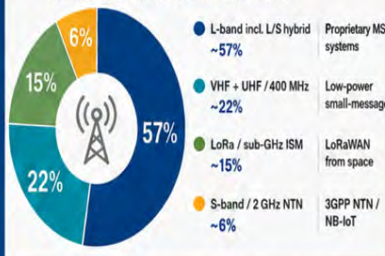


2 SUPPLY SIDE — OPERATOR LANDSCAPE



3 NETWORK TYPES & FREQUENCY BANDS

2026 DIRECT-TO-SATELLITE MARKET SHARE



Technical diversity enables optimization for power, cost, latency and coverage — customers want choice and interoperability.

4 DEMAND SIDE — MARKET SEGMENTS (2026)



Shares may not sum to 100% due to rounding

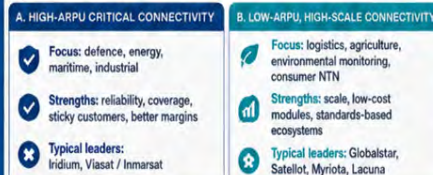
5 VALUE CHAIN — FROM CONNECTIVITY TO OUTCOMES



★ WHY IT MATTERS

Future growth depends on complete solutions, channel partnerships, and simple integration — customers buy outcomes, not airtime.

6 STRATEGIC TAKEAWAYS / BUSINESS MODELS



The market is increasingly split between value-first and scale-first models.

7 OUTLOOK TO 2032



8 WHY EARLIER HYPE MISSED THE MARK

- Addressable market was smaller than the hype implied
- Device cost, power, and antenna constraints slowed adoption
- Service quality and latency were not always good enough
- Fragmented standards and operator instability reduced confidence
- Low ARPU and long solution-sales cycles made scaling harder

BOTTOM LINE

Satellite IoT is real and growing — but the winners will be the players that combine reliable networks, low-cost devices, strong partners, and clear vertical solutions.

Source: Satellite IoT Market Status Report 2026, based on market drafts and 2025–2026 public sources including Berg Insight, IoT Analytics, Iridium, Viasat, Myriota, Kineis, and Deutsche Telekom



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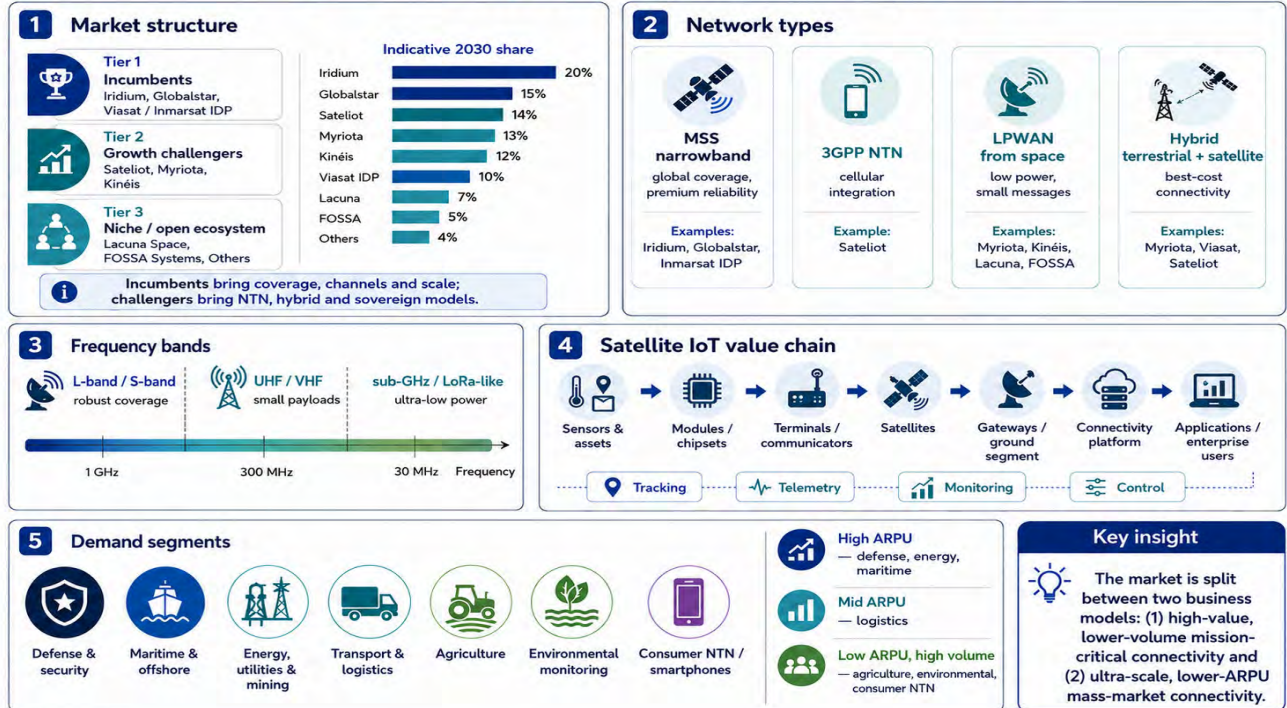
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Satellite IoT Landscape



Short Burst Data satellite communication, LTE-M cellular connectivity, and Global Navigation Satellite System (GNSS) positioning in a single module. A tracking device can therefore communicate through LTE-M while terrestrial coverage is available and switch to satellite when it moves beyond that coverage.

At the same time, Iridium maintains its established proprietary ecosystem, develops higher-capacity messaging through Certus and Iridium Messaging Transport, and prepares NTN Direct for standards-based connectivity. Instead of choosing between proprietary satellite technology and 3GPP NTN, Iridium is positioning itself across both worlds. Its collaboration with SKYWAVE, an ORBCOMM company, reinforces this direction, combining satellite, cellular, and Wi-Fi connectivity within a multi-network environment.

Challengers Search for Their Position

For the next-gen operators, the challenge is more difficult. Companies such as Myriota, Kinéis, Sateliot, Lacuna Space, and FOSSA cannot compete simply by putting cheaper satellites into orbit. The most lucrative established markets are already taken and heavily defended by the incumbents.

Their opportunity lies in markets where lower-cost terminals, very low power consumption, new network architectures, and new distribution models can unlock applications that traditional satellite economics have struggled to serve. But technology alone is not enough. The challengers must also establish commercial ecosystems of service providers, systems integrators, and support organisations capable of addressing fragmented markets such as agriculture, environmental monitoring, and asset tracking.

Kinéis illustrates the specialist approach. Its 25-satellite constellation,

building on the heritage of the Argos system, focuses on applications where very small messages, extremely low power consumption, and long battery life matter more than integration with mainstream cellular infrastructure. Environmental monitoring, maritime applications, livestock management, infrastructure surveillance, and wild-fire detection fit naturally into this model.

The 3GPP NTN operators pursue a different strategy. Sateliot is perhaps the clearest example, designing its satellites as extensions of terrestrial NB-IoT networks. Its growing relationships with operators including Telefónica, Telenor IoT, and Turkcell point toward a fundamentally different distribution model. An enterprise customer may eventually obtain terrestrial and satellite IoT through the same mobile operator, SIM, and service contract rather than purchasing satellite connectivity separately.

A third model avoids the cost

of building a dedicated constellation altogether. Companies such as Skylo use capacity on existing satellite infrastructure, while Myriota's HyperPulse similarly uses Viasat L-band capacity for its 3GPP Release 17-based NTN service. In this model, competitive advantage increasingly comes from network orchestration: determining how a device authenticates, is provisioned, and moves between terrestrial and satellite networks.

This approach potentially reduces the enormous capital burden of owning a constellation and shifts value toward the connectivity-management layer. Yet the difficulties facing newcomers remain evident. Some early players have disappeared, stalled, or diversified into other markets, while companies such as FOSSA and Fleet have broadened their activities beyond satellite IoT.

From Constellations to Complete Solutions

The economics explain much of this consolidation and diversification. Agriculture, environmental monitoring, and mass asset tracking can create huge numbers of connections, but revenue per device remains modest. Building and operating satellites, ground infrastructure, and a global commercial organization purely on low-value connectivity revenue is challenging.

This also explains why earlier market forecasts have repeatedly proved too optimistic. The theoretical population of unconnected assets is enormous, but the commercially addressable market is smaller. Hardware cost, antenna requirements, battery

"...The theoretical population of unconnected assets is enormous, but the commercially addressable market is smaller...."

limitations, intermittent coverage, proprietary technologies, and long enterprise sales cycles all slow adoption.

Success therefore depends on much more than placing a technically capable constellation into orbit. Satellite IoT requires a complete value chain extending from sensors and chipsets through modules, satellites, and network provisioning to cloud platforms, analytics, applications, distribution, and lifecycle support.

The satellite IoT market of 2026 is consequently developing along two tracks. The incumbents and their ecosystem partners continue to dominate high-value critical communications in defence, maritime, mining, transport, energy, and utilities—a market likely to grow further as geopolitical uncertainty increases demand for resilient and sovereign communications.

On a parallel track, a much broad-

er group of challengers is pursuing the emerging volume markets of agriculture, environmental monitoring, asset tracking, and new SME and consumer applications. Among these companies, the 3GPP NTN players appear particularly well positioned because they can partner with terrestrial mobile operators rather than create an entirely separate satellite distribution ecosystem.

Whether this second track finally achieves the long-anticipated scale remains the central question.

When it does, it will mark an important threshold in the history of satellite IoT, when the two tracks merge and satellite connectivity evolves from a specialist communications service into an embedded component of global IoT—terrestrial whenever possible, satellite whenever necessary, invisible to the user. 



Hub Urlings was one of the pioneers of Satellite M2M/IOT as Product Manager Inmarsat-C at the famous KPN Station 12. The success of this "small data" satellite service, its global coverage, and its reliability made Inm-C via our Burum ground station the service of choice for many applications, ranging from emergency communication at sea, contacting the HQ, sending messages to truck fleet management, pipeline monitoring, and collecting data from all types of sensors. Now, 25 years later, he is involved in developing satellite IoT applications for environmental monitoring. His company, M2sat.com, focuses on satellite IoT Hydro-Met solutions using the M2sat IoT Communicator, a low-power edge processor and satellite IoT network-agnostic connectivity hub. In 2022, he founded SatIoTlab.com as a research, education, and co-creation platform for global satellite IoT applications. SatIoTlab operates a test bench with active Sat IoT modems from five different networks. Contact us to learn more. He can be reached at: urlings@m2sat.com

Trends in the IoT Market for Satellites

by **Bernardo Schneiderman**

In 2026, the Internet of Things (IoT) and satellite markets are converging into a phase of intelligent value creation, characterized by smarter automation and the mainstreaming of Direct-to-Device (D2D) connectivity. The satellite IoT market specifically is projected to reach approximately US\$ 2.26 billion in 2026 as it transitions from a niche service to a core enterprise resilience strategy. During 2026 the satellite and IoT landscape is reaching a strategic "tipping point" where connectivity is no longer a technical hurdle but a standard foundation for operational intelligence. The market for satellite IoT alone is projected to reach approximately 32.5 million subscribers by 2029.

Key Trends for 2026 and Beyond

- **Satellite-to-Cellular Convergence (Direct-to-Device):** The distinction between cellular and satellite is blurring. 2026 is seeing the mass adoption of 3GPP NTN (Non-Terrestrial Network) standards, allowing standard smartphones and IoT devices to switch seamlessly between cell towers and satellites.

- **"Resiliency-as-Convergence":** Service providers are moving away from selling "backup" satellite links as niche add-ons and are instead integrating them into "Always-On" premium bundles to guarantee connectivity regardless of terrestrial outages.

- **Physical Artificial Intelligence (AIoT):** IoT is transitioning from passive sensing to autonomous action. AI is being embedded at the edge (on the device) to enable real-time decisions, such as autonomous robot navigation or predictive maintenance, without relying on cloud latency.

- **5G RedCap (Reduced Capability):** This new standard is filling the "mid-tier" gap—offering more bandwidth than low-power sensors but with much better battery life and lower cost than full 5G, making it ideal for video surveillance and industrial automation.

- **Security-by-Design:** With new regulations like

the EU's Cyber Resilience Act taking effect, hardware-based "root of trust" and zero-trust architectures are becoming mandatory for large-scale fleets.

Market Outlook by Sector

- **Logistics & Maritime:** Granular tracking is evolving from "where is the container" to "what is the condition of every box."

- **Agriculture:** Precision farming and livestock management are primary drivers for satellite IoT in remote regions.

- **Drones:** Aerial and water-based drones are becoming "intelligent infrastructure" for inspecting critical national infrastructure (CNI) autonomously.

IOT Satellite Providers

These companies operate extensive satellite networks and hold dominant positions across industries like maritime, agriculture, and logistics.

Iridium Communications (U.S.): Operates a constellation of 66 Low Earth Orbit (LEO) satellites. It is the market leader with over 1.7 million subscribers as of early 2024. Iridium Launching Iridium NTN Direct in 2026 for standardized 3GPP satellite IoT and moving into messaging transport (IMT) for larger telemetry payloads.

ORBCOMM (U.S.): A global leader in industrial IoT, offering seamless satellite and cellular connectivity. It provides both LEO-based (ORBCOMM OG2) and GEO-based (IsatData Pro) services.

Viasat US (merged



Iridium Edge – Global IOT connectivity

with Inmarsat) Launching Inmarsat-8 small satellites in 2026 for safety services; focusing on Viasat IoT Nano (OGx) for proprietary next-gen services., it remains a dominant force in maritime and aviation IoT through its ELERA L-band and Ka-band network.

Globalstar (U.S.): Known for its LEO constellation, it provides high-quality mobile satellite and IoT services. It famously powers Apple's direct-to-phone emergency messaging. Amazon Leo Just acquire Globalstar during April 2026 and with a focus on connected vehicles and home internet.

Space X/Starlink (U.S.): Reshaping the market by driving down costs: transitioning the Swarm IOT platform into a broader integrated Starlink offering. As of 2026, Swarm has largely transitioned from selling individual retail hardware (like the M138 breakout kits) to enterprise-level integrations and Starlink Direct-to-Device (D2C) services. New deployments typically focus on embedding the Swarm technology into larger industrial gateways or leveraging the integrated Starlink IoT ecosystem.

Eutelsat Group (France): Following its merger with OneWeb, it offers a unique hybrid of Geostationary (GEO) and LEO services, specifically through its IoT FIRST solution.

EchoStar Corporation (U.S.): Through its Hughes division, it provides extensive satellite broadband and managed network services globally.

A new generation of companies is focusing on nano-satellites and 5G Non-Terrestrial Network (NTN) standards to lower costs and power consumption.



Inmarsat BGAN M2M Integrated Terminal



Orbcomm ST-6100 Terminal for Satellite IOT

- SpaceX/Starlink: Already the world's largest satellite operator, Starlink is set to enter the Direct-to-Device (D2D) IoT market in late 2025.
- Astrocast (Switzerland): Operates a growing LEO nanosatellite constellation designed for low-power, bi-directional SatIoT services.
- Kinéis (France): Specializes in global connectivity and localization using a nanosatellite constellation for industries like environmental monitoring.
- Myriota (Australia): Offers ultra-low-power satellite connectivity and recently partnered with Viasat to launch a 5G-based NTN service.
- Skylo Technologies (U.S.): A key provider of 3GPP-standardized NTN services, enabling existing cellular devices to connect via satellite without extra hardware.
- Sateliot (Spain): Building a LEO constellation to bring 5G Narrowband IoT (NB-IoT) to remote regions.

Key Market Dynamics (2025-2026)

- **Market Size**: The global satellite IoT market was valued at US\$ 1.77 Billion in 2024 and is projected to reach US\$ 9.17 Billion by 2032.
- **Standardization**: A major shift is occurring from legacy proprietary modules to 3GPP-compliant Non-Terrestrial Networks (NTN) modules, which are expected to surpass 50% of the market by 2026.
- **Multi-Orbit Strategies**: Leaders like SES (following its \$3.1 Billion acquisition of Intelsat) are combining Me-

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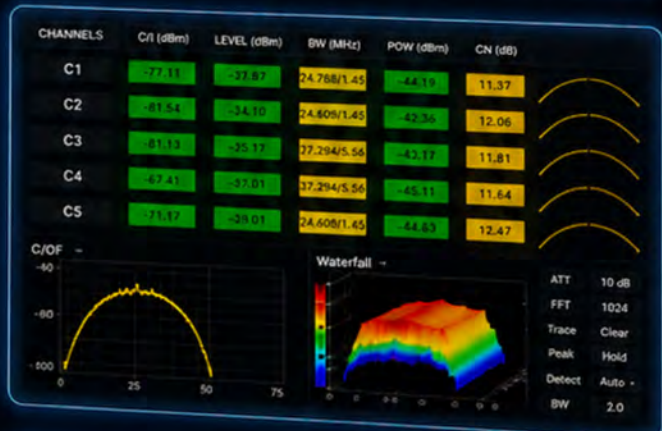
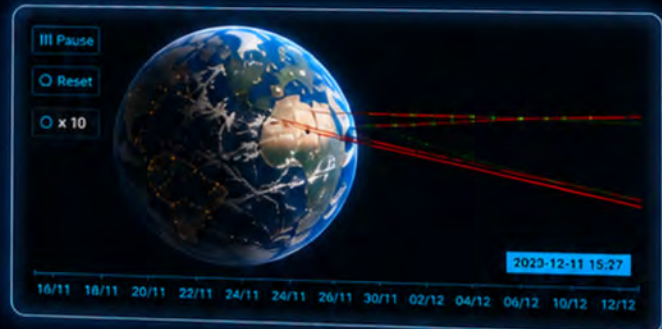
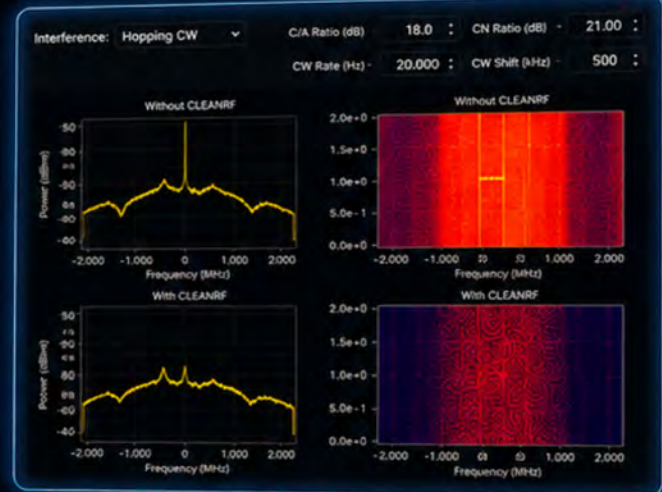
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dium Earth Orbit (MEO) and Geosynchronous Orbit (GEO) assets to provide more resilient, low-latency services.

For a Satellite IoT Service Provider in 2026, the market is rapidly shifting from high-cost niche services to a competitive, multi-orbit landscape driven by Low Earth Orbit (LEO) miniaturization.

The following questions address the critical hurdles for short-term viability and long-term dominance:

Short-Term Market & Application Questions (2026–2027)

-Hybrid Integration: "How can our direct-to-satellite technology seamlessly integrate with existing terrestrial cellular (NB-IoT/LTE-M) and Wi-Fi networks to offer a 'single pane of glass' experience?"

Spectrum & Licensing: "How will we navigate the high costs and complex regulatory hurdles of acquiring both ITU (satellite) and national (terrestrial) spectrum for global services?"

Customer ROI: "In high-impact use cases like remote monitoring, is the cost of our satellite modules and subscriptions clearly justified by the economic value of the data being captured?"

Competitive Pressure: "How will we differentiate our specialized IoT services as mass-market broadband players like SpaceX (Starlink) and Amazon (Amazon LEO) create overcapacity and price pressure in the sector?"

Standardization: "Are we adopting standardized connectivity protocols (like 3GPP NTN) to ensure our hardware remains compatible as proprietary ecosystems decline?"

Long-Term Market & Application Questions (2028–2033)

Long-term success depends on scalability and the shift

toward autonomous, AI-driven ecosystems.

-Capacity & Scaling: "Can our constellation architecture support the projected 34.5 million connections by 2030 while maintaining low latency and high reliability?"

-Business Model Evolution: "Will we transition to a hybrid subscription and outcome-based model that integrates satellite and terrestrial data to capture higher enterprise value?"

Legacy Management: "What is our 5-to-10-year strategy for handling satellite end-of-life and migrating customers to newer standards with minimal service disruption?"

AI & Edge Intelligence: "How will we integrate on-satellite edge computing and AI to process data in space, reducing the bandwidth needed for downlink and enabling real-time decision-making?"

Global Inclusivity: "How can we position satellite connectivity as the primary enabler of global digital inclusion for industries in geographically diverse or underserved environments?"

Key Application Verticals for Satellite IoT

Satellite IoT is essential where terrestrial coverage is non-existent below are the main vertical in the market:

Maritime & Energy: Critical for outage-proof tracking and sensor monitoring for vessels and remote oil/gas infrastructure.

Agriculture: Enabling autonomous farming and real-time monitoring of soil, weather, and crop health across thousands of remote acres.

Transportation: Providing continuous data transmission for autonomous trucking in mountainous or remote regions where cellular gaps exist.

Government & Defense: Dominating initial adoption for border intrusion detection, military logistics, and disaster management.



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Expanding the MENA Media Ecosystem Through

Es'hailSat's Satellite, Teleport and Managed Services

As the global media and broadcast industry converges at IBC 2026, broadcasters are increasingly looking beyond traditional satellite capacity and towards integrated service providers that can simplify operations, improve resilience, and accelerate channel launches. Against this backdrop, Es'hailSat has continued to strengthen its position as one of the Middle East and North Africa's leading satellite operators and managed service providers through a series of strategic milestones, customer wins, and infrastructure investments.

The strength of Es'hailSat's video neighborhood continues to attract leading broadcasters from across the region. Recent additions include Sama Jordan TV, Algeria's El Ikhbariya TV Channel, Syria's Al-Ikhbariya TV Channel, Turkey's Misk Media channels, and Ro'ya TV's portfolio of services. Major media groups have also expanded their presence on Es'hailSat's satellite fleet, including the launch of Rotana's nine HD channels on Es'hail-2 and the deployment of Algerian TDA channels on the same platform. Meanwhile, Morocco's SNRT expanded its satellite services with the launch of two bouquets on Es'hail-1 and the implementation of a DTT distribution solution.

Over the recent past, Es'hailSat has expanded both its satellite neighborhood and its service portfolio. The company announced a strategic partnership with Telesat to introduce next-generation Low Earth Orbit (LEO) connectivity to Qatar and the wider region,

complementing its existing GEO satellite infrastructure and creating new opportunities for broadcasters, enterprises, and government users seeking resilient and flexible connectivity solutions. The company also signed landmark agreements with Türksat and Thales Alenia Space for the development of the new Es'hail-3 satellite, reinforcing its long-term commitment to expanding capacity and regional coverage.

End-to-End Managed Services

Modern media operations increasingly demand end-to-end managed services that reduce operational complexity while maintaining broadcast-grade reliability. This is where Es'hailSat's Tier-4 certified Teleport in Doha plays a central role.

Spread across a 50,000-square-meter facility, the Teleport combines satellite access, diverse fibre connectivity, 24/7 multilingual technical support, data centre services, antenna hosting, and managed broadcast operations within a single resilient platform. The facility's Tier-4 certification from the World Teleport Association underscores its ability to support mission-critical media operations with the highest standards of reliability and business continuity. In addition, various management systems at the Teleport are also ISO certified and highlight our commitment to excellence for the years to come.

Payout and Media Services

A key area of growth is Es'hailSat's Payout and Media Services offering. Designed as a complete end-to-

end solution, the service enables broadcasters to launch, customise, manage, and distribute channels through a single partner. The platform integrates playout, storage, media asset management, compression, encryption, uplink, and satellite distribution, allowing channel owners to focus on content and audience engagement while Es'hailSat manages the technical infrastructure and round-the-clock operations. Whether supporting a single channel launch or a multi-channel media network, the service delivers the flexibility and scalability required by today's content providers.

Equally important is business continuity. Broadcasters face increasing pressure to maintain uninterrupted transmission, making disaster recovery capabilities an essential part of any modern broadcast strategy. Through its Teleport infrastructure, Es'hailSat provides comprehensive Disaster Recovery and backup studio services, ensuring channels remain on air even during unexpected operational disruptions. Combined with redundant systems, professional monitoring, and managed services expertise, these capabilities offer broadcasters a robust safeguard for critical transmission operations.

Es'hailSat continues to reinforce that satellite remains a powerful foundation for video distribution, but its true value is unlocked when combined with managed playout, media services, and resilient disaster recovery infrastructure that keeps content flowing, audiences connected, and broadcasters on air.



CONNECTING QATAR TO THE WORLD AND BEYOND

At Es'hailSat, we power Qatar's communications through cutting-edge satellite technology. From broadcasting and government services to business connectivity and beyond, we ensure secure, reliable, and high-performance satellite solutions across the region. We are enabling a future that is always connected and always advancing.





The Es'hailSat Teleport is Tier-4 Certified by the World Teleport Association. Located in Al Ghuwariyah, to the north of Doha, Qatar and spanning a massive 50,000 sqm, our Teleport provides a range of services including- Playout & Media Asset Management, Disaster recovery and back-up studios for TV channels.

Antenna Hosting

Es'hailSat has a large 14,000 sqm antenna farm that can host groundstations of various sizes and frequency bands. Adequate space has been allocated for the expansion of the facility if needed in the future.

Private Data Center Suite

Es'hailSat provides Dedicated Data Center Suites for customers requiring a fully customizable data center environment. These suites allow clients to manage their own metered power, environmental controls, and connectivity, while benefiting from enhanced privacy, security, and operational flexibility. Dedicated infrastructure options are also available to ensure maximum control for mission-critical systems.

Partial Cabinet / Full Rack

Es'hailSat's colocation services include scalable options such as single-rack units, quarter-cabinet, half-rack, and full-rack configurations, with the ability to expand as operational needs grow. Cabinets are accessible 24x7 to authorized personnel only, ensuring secure and continuous availability.

Teleport Co-location space

Es'hailSat's Tier-4 Teleport facility includes dedicated rooms that can be used as co-location units, office spaces, or studio equipment rooms. These areas provide secure, scalable environments designed to accommodate a variety of operational and broadcast requirements.

24/7 Monitoring

Es'hailSat's Teleport is operated by a team of multilingual, highly skilled professionals who provide 24/7 operational support. This continuous management delivers significant advantages by enabling comprehensive monitoring from both, a network operations and satellite control perspective, ensuring maximum service reliability and rapid response capabilities. (image courtesy of Es'hailSat)





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The Power of Data: Rethinking the Value of Satellite Broadcasting

by Adir Hadad

For decades, the value proposition of satellite broadcasting has been remarkably clear: reliable, efficient distribution at enormous scale. It can reach audiences across countries and continents regardless of the quality of local terrestrial or broadband infrastructure.

What is changing is how broadcasters define the value of that reach. Delivering a signal is no longer the end of the conversation. Broadcasters increasingly want to understand what happens afterwards: where audiences are watching, for how long, on which devices and where engagement is strongest.

Digital platforms have made this visibility commonplace. Satellite, by contrast, has traditionally provided enormous reach with far less information about how that translates into actual viewing. Closing that gap could be one of the most important developments for satellite broadcasting over the next decade.

The Data Gap Is Becoming a Business Issue

Distribution decisions are increasingly commercial decisions, and broadcasters and content owners are under pressure to demonstrate the value of every part of their strategy.

Knowing that a channel is available across a particular satellite footprint remains important, but availability alone cannot provide the complete picture. Audience data can influence programming, advertising, localisation, market expansion and investment.

If a broadcaster sees particularly strong engagement in one territory, that may justify additional commercial activity. If viewing patterns reveal an audience developing somewhere unexpected, that can influence the next distri-



bution decision. Data turns assumptions about markets into evidence.

This is also why the satellite-versus-streaming debate feels increasingly outdated. Broadcasters already operate across multiple distribution environments. The more relevant question is how satellite can gain some of the visibility associated with digital media without losing the scale and reliability that make it valuable.

Giving Satellite Greater Visibility

This challenge has been central to the development of iKOANALYTICS at iKO Media Group. Broadcasters invest significantly in distributing channels via satellite, yet understanding actual consumption once those channels reach viewers has historically been much harder than within OTT environments.

iKOANALYTICS brings satellite monitoring and distribution information together with audience analytics. For supported connected television environments, broadcasters can access data including minutes watched, total accesses, device information and geographic insights alongside information about their satellite services.

The important part is not simply having more metrics, but being able to use them. Operational teams can understand the health and performance of a service, while audience data can inform programming, distribution and



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commercial strategy. Rather than simply confirming that content has been delivered, data can help broadcasters understand what that delivery is achieving.

From Monitoring to Commercial Value

Satellite broadcasting has always generated data. Signals are monitored, performance is analysed and faults are identified because reliability is fundamental to professional broadcasting. Most of that information, however, tells us about the technical health of a service rather than the value being created once content reaches an audience.

Bringing those perspectives together creates a much more useful picture. A broadcaster may know that its signal is performing correctly across several territories. Audience data can add another dimension by showing where engagement is strongest and how consumption varies geographically.

That information has value far beyond engineering. It can support decisions around scheduling, content acquisition and localisation, while helping broadcasters assess whether a market warrants further investment.

It also matters for monetization. Advertisers have become accustomed to the accountability of digital media. Satellite does not need to replicate every characteristic of digital advertising, but stronger audience visibility gives broadcasters better evidence of the audiences they reach and a stronger foundation for demonstrating commercial value.

Satellite Does Not Need to Become OTT

There is a temptation whenever data enters the conversation to measure traditional broadcasting against streaming. That misses one of satellite's greatest strengths.

One signal can reach enormous geographic areas efficiently and consistently without requiring an individual broadband stream for every viewer. In many markets, that combination of scale, accessibility and reliability remains extremely difficult to replicate.

The opportunity is not to turn satellite into OTT, but to address some of its historical limitations. Data is an important part of that evolution, alongside the growing connection between satellite, cloud, IP, FAST and OTT.

It is also why iKOANALYTICS has been integrated within iKOSYSTEM. Satellite monitoring, distribution information and audience analytics can sit alongside the

wider services broadcasters already manage, extending visibility beyond channel delivery towards understanding what happens after a channel reaches viewers.

Making Reach More Valuable

There are limitations. Not every television environment is connected, measurement capabilities will vary between markets, and satellite will not suddenly produce exactly the same datasets as a purely digital platform. Nor does it need to.

The objective is greater visibility and the ability to turn that visibility into better decisions. Satellite has spent decades becoming more efficient, reliable and scalable. Data now adds another dimension to that value.

For broadcasters, this means moving beyond measuring distribution simply by footprint, capacity or technical performance. Reach becomes considerably more powerful when there is evidence behind it: where audiences are engaging, how they are consuming content and where new commercial opportunities may exist.

At iKOMG, the development of iKOANALYTICS reflects that direction, but the shift is much broader than one platform or company. It represents a change in what broadcasters should expect from satellite distribution itself. The question can no longer end with whether a channel successfully reached its destination; broadcasters should increasingly understand what happened when it got there and use that knowledge to decide what happens next.

Satellite has already proved the power of its reach. The next chapter is about proving the value behind it—and data is what can make that possible.



Adir Hadad is the VP of Cloud Services at iKO Media Group (iKOMG). For more information on iKOMG's cloud-based broadcast management and other services for the broadcast industry, go to:

www.ikomg.com

AI for Good Keeps Humanity in Focus

by Roxana Dunnette

From 7 to 10 July over 12,000 attendees from 170 countries and representatives from United Nations (UN) organizations gathered at the Palexpo in Geneva, Switzerland for another edition of **AI for Good Global Summit 2026**.

The message from the Secretary General of the International Telecommunications Union (ITU) and the UN, Pope Leon XIV, rapper will.i.am, and numerous distinguished speakers was the same: Keep the human control and judgment over Artificial Intelligence (AI). Some decisions must remain forever be made by humans and we must set the terms of security and standard on how machines and humans interact.

While the potential of artificial intelligence is proven, we have to keep in mind how to serve the integral human development, respect the truth, freedom and justice and not aggravate inequalities, control and exclusion.

Distinguished speakers and panelists explored in more than 200 sessions the positive aspects of AI and the disturbances it can bring as AI development is moving too fast (it took Internet 15 years to be here AI only two) and we are not prepared for it.

The risk is not from the outcome of technology, which can make things easier for us but from the vision from which is built and what humans become in the process as AI does not know what is love, friendship or responsibility. Making things easier can diminish rather than enhance our abilities.

For AI what are important is speed, efficacy and not the respect of the freedom and human dignity. On the contrary if this technology is built and used in a wise perspective it can be the occasion for growth, justice

- **Agentic AI Security Focus Group**
- **First Global and FYI.AI Coalition** to bring AI learning experience in 190 countries advancing Robotics for Education.
- **ITU Global Standards Initiative** to build trust in AI behavior and identity.

The AI for Good Global Summit explored many aspects of AI, health, employment, learning, child protection, space, longevity, food, standards, networked cars, banking, robotics, disaster resilience, ethics, war...and even

how to fight against mosquitos.

There were also a lot of competitions and awards for youth projects as well as AI art and performances.

I choose only key few subjects:

AI GOVERNANCE FIRST DIALOGUE, occupied the first two

days of the summit. "Make AI safer, more accessible and more ethical, to help build a future of AI by humanity, with humanity for all humanity," said António Guterres, UN Secretary General.

Global Participation Leads to Global Action

The UN will set up a **Glob-**



and fraternity.

At the Summit many initiatives have been launched including:

- **AI Skills Coalition**, a global platform with 70 partners offering free courses in 200 countries in 13 languages.
- **AI and Robotics for Health** with the World Health Organization (WHO).

al Fund for AI to build skills, bring data and computer power everywhere.

The UN AI **Environmental Initiative** will call every AI company to measure and publish the full footprint of its systems, carbon, water and land and to commit to power data centers with renewable energy.

No company should deploy AI systems accessible to children without specific safety measures.

20 Member States responded to the UN Global Network for Exchange Cooperation on AI and Capacity Building. A full report on results of the UN initiatives on AI Governance will be presented at General Assembly in 2027.

AI for Health

AI for Health was the subject in many sessions but we moved forward to AI and Genomes and how to cure diseases.

More than 50% of the world population does not have access to proper health care. We can have enormous data on biology and health but so far it was impossible to access it or process it.

With AI things change, the data you provide create value and financial value, we can process the data and predict at national scale epidemics, make medicine in advance take appropriate measures. Governments have to invest



in AI and make sure they have the money to process the data.

New gene therapy or teaser blood tests that detect cancers in stage 0 can cure diseases but are expensive.

In AI and diagnosis field who is responsible if something goes wrong?

A regulatory framework is necessary.

AI and Space

Beyond earth, AI for Space presents new challenges on how to save time, solve problems, put computing in the space.

The new AI model in the space has satellites talking to satellites not only to earth, data centers in the space, which makes sense and will save power and land on earth. In the space we have other conditions.

AI satellites will be produced faster with computing in the space from the construction. Software Defined Satellites (SDS) provided more flexibility and can incorporate AI to make satellites more responsive and provide the ability to make changes in

its parameters while in space.

How to repair satellites in the space is a question that came up. There are thousands of satellites in space that can't be protected from debris. The carbon footprint is not clear. In space there is no governance on traffic, debris protection so AI governance on earth has to extend to space. Robots will be used a lot for missions on Mars and other planets to save humans.

AI and Ethics

Countries face dilemmas on whether they need to have AI, which model works and how much money they need.

How they will sustain this in a long run as they are not prepared for the complexity of this issue.

The panel addressed more questions then give answers.

High quality data needed requires a trained workforce and a regulatory framework.

AI is an extension of human creativity and we have to merge with it.

AI is not neutral we have to be



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aware that the speed of technological development is in equilibrium with consciousness development .

Ethics in general is not sufficient we need a legal framework , an independent survey, user education and clean politics.

Without it, those who control of AI will impose their proper vision, which will become the invisible infrastructure of the systems .

Ray Kurzweil, inventor and futurist, talked about the power of AI. By 2029, Artificial General Intelligence (AGI) will exceed humans capabilities. This will lead to a revolution that will transform and disrupt everything, said Kurzweil. AI will be big on health and will surpass doctors. Teaser Labs blood analysis is an example .

Ray created his own avatar Ray who had a message for the audience: "singularity will be here for the next generation and we have to prepare the merger humans- machines."

Adaptability and creativity is the key. If you want to preserve memories of loved ones the digital twin can do that, he added.

Who knows maybe AI will have a soul, meditate, pray?

The CEO of Galaxy shared the same vision from physical AI to soul AI . His closing K Pop show with dancing robots was announcing the trend.

AI and Education

How AI will change th Education with full respect for human dignity and integrity was an interesting topic discussed by Michel Crow and artist will.i.am.

Education in the era of AI presents three main challenges:

- Sociopolitical - inequalities among countries, different levels between public and private schools, access-to education.
- Pedagogical –some establishments can integrate rapidly new technologies, train teachers others can't .
- Intellectual – the link with wisdom .If we are not careful the overwhelming flow of information can diminish the critical reasoning, creativity and attention.

For that reason new alliances are necessary and a new approach to education . The way we learn now is not going to be in the future

Arizona State University is an example—it changed its structure, became more inclusive and combines traditional education and new way of teaching .

Will.i.am gives courses on Agentic AI to help students define their own interests, solve problems, build their own confidence and follow their vision.

will.i.am like Pope Leon XIV in his book Magnifica Humanitas reminded us that what makes harmonious learning is love that brings joy to you and others. (see sidebar interview with will.i.am)



Roxana Dunnette is a correspondent of *Satellite Executive Briefing* based in Geneva, Switzerland. She is Executive Director, R&D MEDIA, Switzerland. She has had an extensive career in broadcasting and media including senior management positions at Worldspace, CBS and PBS in New York and international telecommunications regulatory work at the UN in New York and ITU in Geneva as US government representative. She accomplished many development projects in Africa based on satellite technologies, broadcasting, Internet and accessibility. She can be reached at: roxanadunnette@gmail.com

Where is love we can create a culture of negotiation and a civilization of love.

Power of Standardization

Seizo Onoe, Director of the Telecommunication Standardization Bureau of the ITU was very clear. She said that in the era of AI and Robotics standards are needed for AI Agents to be trusted and verified . We can then unlock their potential stay in control and take responsibility for what they do.

Security standards at all levels can detect what is authentic , what is safe especially when they write their own codes at high speed and work with less and less human oversight and act without human control or judgment, she added.

A new ITU Focus Group was created for trusted digital identity and accountable AI Agents behavior.

The exhibition at Palexpo was interesting with art shows, movies screenings, less humanoid robots but lots of driverless cars and drones.

We expect another summit next year with new AI applications. It's a fast changing and evolving application and the AI for Good conference provides a very good overview of this important issue. 

EXECUTIVE SPOTLIGHT

At the recent AI for Good Global Summit in Geneva, Satellite Executive Briefing correspondent Roxana Dunnette caught up with world-renowned artist, entrepreneur, defender of education, specialist in innovation and now International Telecommunication Union (ITU) Goodwill AI Ambassador, will.i.am.

Roxana Dunnette (RD): *You give courses at Arizona State University on Agentic AI to help students experience a new form of learning. What skills and knowledge are important for the future generation?*

will.i.am: The concept of skills is changing .If you take Quincy Jones, a skillful musician, and you compare it to me .By definition I am not a musician .I can't read or write music. I can't play music like Quincy Jones. I can write songs, I can sing the songs. I write, I can produce but not like Quincy Jones. I use digital technology that liberated me to have ideas, to make songs, to give joy but I am not a musician like Quincy Jones.

What does it means for the developers of AI? What is the definition of skills? It is intentions, now people just have to have ideas. What we teach in school is to be ambitious, to solve problems. Communities are full of problems unsolved, these problems are gold mines because when you solve them there are careers, and there are jobs.

What is your intention? A skill nowadays is intentional. Now that you have this abundance of knowledge and machines, the folks in those communities can have access to the knowledge that did not have before and this is going to value the success. Marketing and success that undetermined people living conditions will not work with AI. AI is not doing this, its is borrow everything from human practices.

Let's take an AI company: no human works for just one chairman. This is a positive future. Imagine the company making a product, selling it and making a lot of money. We say "what a success how do they do that," and AI says "I 've just learn from you guys," so I was successful just like you.

That means skills are values .We teach students to have intentions, solve problems, understand the basics, but we also give them the understanding what the model is so they understand the basic data. Now with AI Agents there is a reason for you to keep your data.

RD: *As a Doctor of Humanities (Honoris Causa) what is your opinion about protecting people in the contest of AI to become responsible and even better persons?*

will.i.am: You can configure your agent. You take your data from the cloud which keeps it and configure your agent .You are in control, it is like crypto but it is not crypto. Your data is like the key from your house you keep it, you don't give it to everybody like today when you share everything on social media.



will.i.am speaking at the AI for Good Global Summit 2026

Your data and your agent are yours .You come to your agent as a user and to configuring its abilities is communicational, conversational .We make it is super simple for a non tech person. Of course there are AI wizards and for them we propose more.

RD: *Will AI democratize creativity or will it empower only a few platforms?*

will.i.am: No, AI will allow the public to compete on different platforms. The idea that everybody is working for the same company is over, the world tomorrow will be diverse and much better .The libertarian spirit that founded this nation is again around the corner.When AI democratizes, small businesses are democratized .We will have an uprising because they will have the knowledge of big companies, like Starbucks and small coffee shops.

RD: *What will be your role as ITU AI Goodwill Ambassador?*

will.i.am: I am taking the work I have been doing in robotics, and my professorship in building AI Agents encouraging students to run their problems and solve them to the Global South: Asia, Africa, Latin America to liberate folks in those countries and ask every builder, every politician to put AI behind HUMANISM.

Another reason I am doing this is to remind people and policy makers that AI for Good and AI for ALL is the prompt. It is our job to execute the prompt.

Humanism is the best.

If we don't, the country will fail the society will fail.

We can't have AI *for bad*.

AI should not be like social media; we have to learn from it, from the hate, the distraction and make Artificial Intelligence a total different business model.

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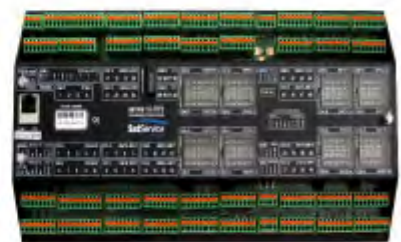
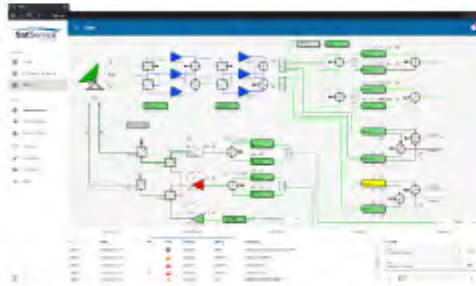
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StarWin satcom robot dog ML03-A1 adopts the DEEP Robotics Lite3 as its body, providing signal transmission and power input for the externally mounted satellite communication terminal through standard communication and power interfaces. The satellite communication terminal integrates narrowband satellite communication modules (TianTong, TianQi, and NTN IoT modules) to achieve redundant narrowband satellite communication. It is compatible with domestic and international cellular communication standard protocols through the Quectel EM05-G global 4G module to ensure stable cellular network communication, and converts satellite/4G networks into wireless networks via a Wi-Fi module for sharing, enabling



surrounding devices to connect to the internet. It integrates a microphone array and speaker to achieve intelligent voice interaction in all scenarios, and integrates an electronic display screen for emotional interaction, information display, and human-machine interaction, enabling functions such as information viewing and message sending through interactive operations.

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Orbital Connect Expands Broadcast Distribution Solutions Across Europe and the Americas

Orbital Connect is expanding its broadcast and media portfolio with project-based Broadcast Distribution Solutions that combine Eutelsat satellite services with professional playout, video processing, contribution, RF and receive infrastructure for television channels and media organizations across Europe and the Americas.

The solutions can be built around an existing broadcast signal chain or a new deployment. Broadcasters can retain established playout, encoding, contribution and headend systems where appropriate, or add new capabilities using technologies such as PlayBox Neo Channel-in-a-Box and MediaKind Beam. Satellite, RF, networking and receive-side infrastructure can then be selected around the technical and operational requirements of the project.

Through its agreement with Eutelsat, Orbital Connect can incorporate permanent and occasional satellite services into broader broadcast distribution projects. Teleport and other transmission-related services may also form part of the project according to the applicable service scope and deployment requirements.

For an established television service, the starting point may be an existing channel output or encoded transport stream delivered over the broadcaster's current IP, fiber or other contribution path. The distribution architecture can then add the required satellite segment and downstream receive infrastructure without requiring replacement of systems already in operation.

For new deployments, or where additional channel origination capabilities are required, Orbital Connect offers PlayBox Neo Channel-in-a-Box technology supporting ingest, scheduling, automated playout, playlist management, channel branding and graphics across SDI, IP and hybrid broadcast environments.

For contribution, encoding, transcoding, multiplexing, reception and headend processing, Orbital Connect offers MediaKind Beam. Processing capabilities can be selected according to codec, signal format, contribution method, service architecture and downstream distribution requirements, allowing Beam to supplement an existing environment or form part of a newly built broadcast chain.

The solution also extends to the receive side of the satellite path. Orbital Connect supplies professional IRDs and decoders, fixed and tracking antennas, LNBs, RF distribution equipment, switching and redundancy systems, IP networking, monitoring equipment, software and related broadcast infrastructure.



This is particularly relevant where a broadcaster is entering a new territory or distributing a service to multiple affiliates, cable or IPTV headends, regional broadcast facilities or other professional receive locations. Each destination may require a defined combination of antenna, RF, decoding, signal distribution and network equipment appropriate to the selected service.

The scope can therefore vary considerably from one project to another. A broadcaster with an established playout and encoding environment may require additional satellite and receive infrastructure to extend an existing channel into a new market. Another deployment may require new playout, processing or headend capabilities in addition to the transmission and reception systems.

Rather than defining every project around a fixed platform, Orbital Connect builds its Broadcast Distribution Solutions around the customer's signal path, existing infrastructure, coverage requirements and operating environment. Technologies and services are selected according to the role they need to perform within that architecture.

By bringing together Eutelsat satellite services, PlayBox Neo, MediaKind Beam and Orbital Connect's broader SATCOM, RF, networking and professional receive portfolio, broadcasters can source multiple elements of a distribution project through one commercial supplier with technical product support.

For broadcasters extending an existing channel, entering a new market or developing a new distribution environment, Orbital Connect Broadcast Distribution Solutions combine the satellite service, broadcast technology and professional infrastructure required around the specific application.

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How Satellite IoT Can Enhance Remote Water

by Alastair Macleod

How data is monitored is changing across the water sector. It is no longer something that is merely collected for compliance and reviewed periodically. It is being examined more closely, and more often, by a wider set of stakeholders. Regulators are asking more of it, the public is seeing more of it, and when incidents occur, it is often the first place scrutiny turns.

In England, the Environment Act has formalised requirements around storm overflow monitoring, alongside a broader push for transparency that has kept the issue firmly in the public eye. At the same time, enforcement has hardened. Serious breaches can now attract substantial penalties, and the practical threshold for intervention has lowered.

In the United States, a similar dynamic plays out through National Pollutant Discharge Elimination System (NPDES) reporting, where the accuracy and completeness of discharge monitoring reports can quickly become a compliance issue in their own right. Taken together, these pressures are changing what is expected of monitoring systems. It is no longer enough to demonstrate that monitoring is in place. The expectation now is that the data is continuous, time-aligned and can be defended after the fact. In practice, that is placing far more weight on the reliability of the data pathway itself, particularly how information is transmitted from remote sites.

Where current systems are inadequate

That shift is beginning to expose some of the weaker assumptions in how monitoring systems are designed, particularly in relation to connectivity. In many cases, the issue is not



measurement, but how reliably that data can be transmitted from remote sites. A large number of monitoring points, by their nature, sit in locations where communications infrastructure is limited. River sites, reservoirs and discharge locations are often well outside reliable cellular coverage, and even where coverage appears available, it is rarely consistent. Performance can degrade during periods of high demand, adverse weather or power disruption, which tend to coincide with the very conditions under which monitoring data becomes most important.

In day-to-day operations, these limitations are often managed pragmatically. Data may be buffered locally and transmitted later, or gaps

may be filled through interpolation and manual reconciliation. Over time, these approaches become embedded in operational practice and are rarely questioned. The difficulty arises when the data is subject to external scrutiny. If a gap appears at the same time as an incident, or if timestamps cannot be traced cleanly from the point of measurement through to reporting, confidence in the dataset begins to erode.

At that stage, the discussion moves beyond individual readings and towards the reliability of the system as a whole. For operators, that is starting to translate into a design question rather than an operational workaround.

This is where connectivity architecture, including the role of satellite, starts to matter.

How satellite can remove uncertainty

Satellite Internet of Things (IoT) has a practical role here. Rather than being viewed as a specialist or last-resort technology, it can be understood as a way of removing a specific and well-defined source of uncertainty. Satellite networks make it possible to transmit data from locations where terrestrial connectivity cannot be relied upon, without introducing dependency on local infrastructure.

For most water monitoring applications, the requirement is not for high bandwidth, but for the dependable delivery of relatively small, time-sensitive messages such as alerts, threshold



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breaches and system status updates. In that context, satellite connectivity provides assurance that these critical events are communicated when they occur, rather than when a network becomes available again.

In practice, the most resilient monitoring systems tend to use satellite and terrestrial connectivity in combination, rather than treating them as alternatives. Satellite links can be used to guarantee the transmission of critical signals from remote or vulnerable points in the network, while cellular connectivity can support higher-frequency communication where coverage is sufficient. The result is not simply improved coverage, but a reduction in single points of failure within the data pathway.

Designing for traceability in real conditions

This becomes clearer when considering how such systems operate in real conditions. In a remote reservoir scenario, for example, pump activation may depend on upstream water level measurements. If that upstream signal is dependent on intermittent cellular coverage, there is an inherent risk that the trigger will be delayed or missed altogether. Introducing a satellite link for that measurement changes the reliability of the system in a fundamental way. The trigger can be transmitted as soon as the threshold condition is met, while downstream components can continue to use cellular connectivity to confirm status and provide additional context where available.

What emerges is a sequence of events that can be followed and verified, from measurement through to action and confirmation, with each step time-stamped and independently

recorded. That ability to reconstruct what happened, and when, is becoming increasingly important.

A similar approach is increasingly evident in river monitoring, where there has been a gradual move away from monolithic logging systems towards more distributed architectures. In these setups, core parameters such as level, velocity and water quality indicators are captured and logged at the edge, with thresholds configured to identify abnormal conditions. When those thresholds are exceeded, alerts are transmitted immediately, while routine data is retained and made available for reporting. This reduces the need for complex integration between separate logging and communications systems and helps ensure that the resulting dataset is consistent from the outset.

From data collection to data defensibility

What sits behind both examples is a broader shift in emphasis, from data collection to data defensibility. Regulators are not only interested in whether monitoring has taken place, but in whether the resulting record is complete, coherent and traceable. That places greater importance on the integrity of the data pathway, including the preservation of timestamps from capture through to reporting, the ability to account for transmissions, and the visibility of any changes made to system configuration.

Where these elements are in place, the need for manual reconciliation is reduced, and the data can be used with greater confidence both operationally and in formal reporting. It also becomes easier to integrate monitoring data into wider systems. Structured,

time-aligned data can move more readily into regulatory submission platforms, GIS environments and asset management systems without the need for extensive reprocessing. This supports a closer alignment between field measurements and institutional records, which is becoming increasingly important as reporting expectations continue to evolve.

Raising the bar for confidence

Monitoring in the water sector is moving into a different phase. It is no longer defined solely by the ability to measure environmental conditions, but by the ability to demonstrate that those measurements are reliable and complete. Satellite connectivity does not replace terrestrial networks, and it is not required in every application, but in remote or infrastructure-poor environments it addresses a point of weakness that is becoming harder to ignore.

As scrutiny increases, the systems that perform best will be those that can not only generate data but defend it when it is questioned.



Alastair MacLeod is Chief Executive Officer of **Ground Control**, a UK and US-based technology company specialising in satellite and hybrid IoT communications for remote and mission-critical operations. With more than 25 years' experience in global connectivity and M2M solutions, he has led multiple innovations in low-power asset tracking and data efficiency across logistics, utilities, and environmental monitoring sectors. He can be reached at: alastair.macleod@groundcontrol.com

From Constellations to Convergence: Value Beyond Coverage

by Markus Fritz

The satellite industry has proven it can deliver connectivity almost anywhere on Earth. Ubiquitous coverage is no longer a differentiator; it is the baseline. For the next generation of smart mobility autonomous vehicles, precision agriculture, connected rail, advanced air mobility and defense - true value lies in intelligently orchestrating multi-orbit assets and multi-domain space capabilities, seamlessly integrated with terrestrial networks. The era of convergence has begun, where Satcom, Positioning, Navigation and Timing (PNT), Earth Observation (EO) are fused into single, actionable streams.

EO imagery for crop health, Global Navigation Satellite System (GNSS) and emerging Low Earth Orbit-Point, Navigation and Timing (LEO-PNT) signals for autonomous tractors, Satcom for real-time telemetry in rural areas, and weather forecasts. John Deere builds satellite data directly into their precision-farming operations center.

In autonomous vehicles, the demand for orchestration

The future of mobile vehicle operations Lies in Multi-Orbit and Multi-Domain Solutions to maximize user value.



The Demand Side: "Multi-Domain Orchestration in Action"

The "why" is driven by a powerful combination of consumer demand, safety regulation, and strategic end-users - no longer buying bandwidth or pixels; they buy outcomes. Smart farming offers a compelling blueprint. Telespazio, through its e-GEOS digital platform, is delivering multi-space domain orchestration for agriculture, fusing

is even more pronounced. Terrestrial to Non-Terrestrial Network (NTN) integration means a car must hand over seamlessly from 5G roadside units 5G NTN, while simultaneously ingesting GNSS corrections from Galileo or Xona's LEO PNT service for lane-level positioning, and receiving road hazard alerts derived from thermal

EO or Synthetic Aperture Radar (SAR) imagery. A single satcom pipe or a standalone Global Positioning System (GPS) receiver can no longer meet the emerging requirements for autonomous vehicles; only a converged multi-domain stream can.

Smart transportation and rail follow the same logic. Real-time tracking across continental routes demands continuous multi-orbit connectivity, while EO monitors infrastructure deformation and vegetation encroachment. PNT ensures positive train control where terrestrial networks fail. Smart aero from aircraft to Electric Vertical Take



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Off and Landing (eVTOL) and drones requires seamless connectivity, EO for volcanic ash and severe weather avoidance, and resilient 3-dimensional PNT. Maritime and shipping increasingly rely on orchestrated platforms that combine multi-orbit satcom for crew welfare and IoT, SAR and optical EO for ice monitoring and piracy detection, and optimized weather routing.

Emergency services need instant situational awareness post-disaster. An orchestrated platform delivers pre- and post-event EO and SAR, resilient PNT for search teams, and on-the-move satcom via GEO/LEO, all fused into a common

operating picture. Military and Defense - takes this to the extreme. "Space-supported 360° situational awareness" describes a battle management ecosystem, where multiple satellites feed a unified threat and environment map, enabling agile action. The ICEYE Rheinmetall orchestration platform, is a prime example. It integrates ICEYE's own SAR satellites with thermal infrared data from OroraTech, hyperspectral monitoring from Constellr, and rapid satellite manufacturing from Reflex Aerospace, offering Defence customers a single, multi-sensor space intelligence solution.

The Supply Side: "Satellite Operators Build the Orchestration Layer"

Satellite operators are retooling their strategies from connectivity providers to orchestration platform owners. The clearest manifestation is the wave of multi-orbit consolidation and partnership.

Eutelsat OneWeb combines GEO and LEO connectivity under one roof, targeting mobility segments. SES and Intelsat are pursuing multi-orbit GEO/MEO architectures, while co-investing in LEO ventures such as Lynk, Omnispace and OQ Technology to extend into direct-to-device and Internet of Things (IoT). The planned combination would create an unparalleled multi-orbit fleet, enabling dynamic service orchestration across orbits. Viasat, following

the Inmarsat acquisition, now orchestrates Ka and L band capacity across GEO and LEO through partnerships, while its recent agreement with Space42 (branded as Equatis), aims for seamless,

multi-orbit, multi-waveform mobility services.

SpaceX is a special case. Starlink already provides low-latency global connectivity and is actively exploring a secondary, triangular PNT capability from its LEO constellation, complementing traditional GNSS. Its Starshield programme extends the platform to include SAR and EO, creating a vertically integrated multi-domain offering for government and Defence.

On the dual-play EO and data side, orchestration is equally vibrant. Open Cosmos offers "Open Constellation," an end to end infrastructure that lets customers launch and manage multi-sensor EO missions, and has recently introduced "Connected Cosmos," which aims to provide seamless Ka band connectivity, integrating communications directly into its data orchestration platform. ICEYE's federated constellation model allows partner nations to own co-located SAR satellites, contributing data to a shared orchestration pool.

From Constellations to Convergence – Multi-Orbit Solutions.

The future of mobility connectivity

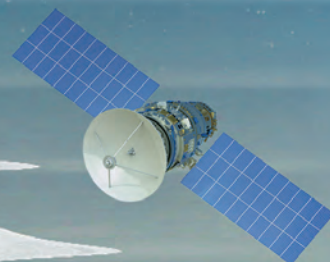
- ❖ is not about choosing between **GEO, MEO, or LEO** nor between **Satcom, PNT, or EO**.
- ❖ It is about orchestrating all of them together with **Terrestrial Networks** to deliver optimized user value.





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Meanwhile, LEO-PNT is emerging as a critical orchestration domain. Beyond Galileo's authenticated positioning, dedicated LEO PNT constellations are being built. Thales Alenia Space and OHB/GMV are both developing LEO PNT demonstrators for ESA, while GMV's high accuracy PNT correction data service also delivers the integrity and centimeter level precision required for autonomous mobility. These services can be integrated alongside Satcom links and EO data in the unified control interfaces that Tier 1 automotive suppliers and Defense integrators are beginning to demand.

Underpinning much of this activity, Europe's industrial champions are placing orchestration at the heart of their space strategies. SES, Eutelsat and Hispasat are building multi-orbit constellation offerings. Airbus is advancing multi-orbit terminal technologies. The LEO NMS web-based multi-user tool of Integrasys facilitates seamless orchestration and management of LEO, MEO, and GEO constellations. The European Space Agency's Bridging Across Space-based Systems (BASS) team acts as a critical integrating force in this domain, bringing together the Satcom, PNT and EO communities to develop cross-domain use cases make cross-domain orchestrated space solutions a reality.



main fabric will own the customer relationship. Leveraging AI to support this orchestration will significantly boost operators' capabilities, enabling real-time resource allocation, predictive service optimization, and automated cross-domain fusion at scale. To convert ubiquitous coverage into truly transformative smart mobility solutions, the satellite industry must merge multi-orbit and multi-domain assets into seamlessly orchestrated platforms, unlock exponential user value - and drive market penetration far beyond connectivity alone.

The Convergence Imperative

The satellite industry is transitioning from selling pipes and pictures to selling integrated outcomes. This demands business-model innovation, joint standards, open APIs, and cross-domain partnerships as much as it does multi-orbit antenna technology. Operators that simply add more capacity will struggle to capture a premium; those that embed their capacity within an intelligently orchestrated multi-do-



Markus Fritz is the Managing Director & Owner of **ADVISORIO**, a premier consultancy serving global leaders in telecommunications, space, automotive, smart mobility, and ICT. Markus advises on growth strategy, market development, partnerships, business models, and M&A, guiding corporations, scale-ups, public institutions, and think tanks in commercializing innovation. With 25+ years of executive leadership at SES Astra, Eutelsat, and Arabsat, he directed international commercial strategy, marketing, and strategic partnerships. A former board member of Digital Europe and ZVEI, and SAMENA Council Ambassador, he shaped policy and interoperability and open standards in the ICT industry. He can be reached at: markus.fritz@advisorio.com



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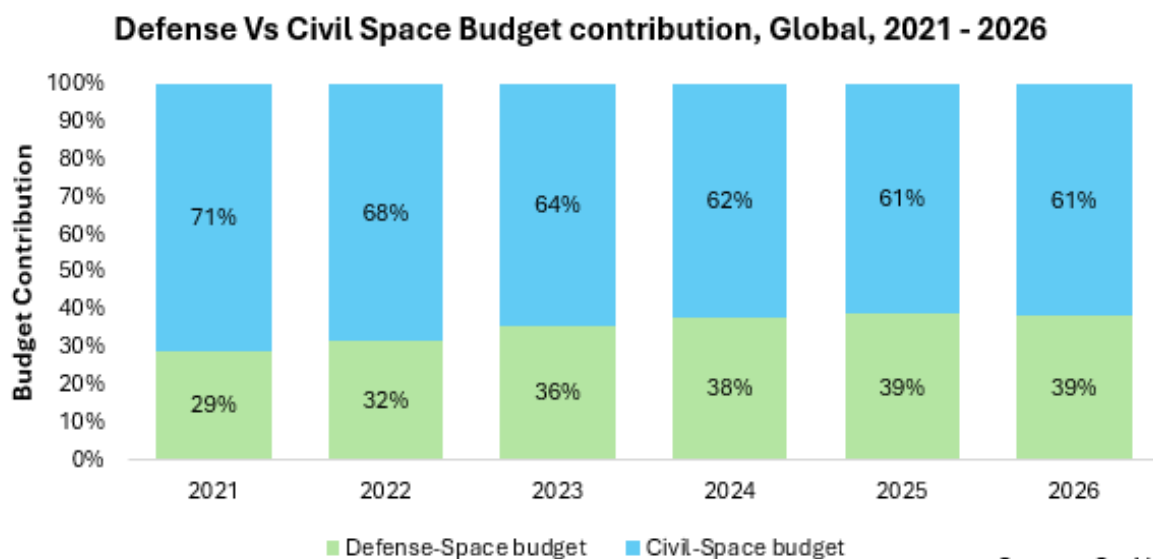
Military vs Civil Space Spending: The Defining Shift in Government Space Budgets

by **Aishwary Pachaury**

For decades, government space budgets were viewed mainly through civil ambition: lunar and Mars missions, Earth observation, human spaceflight, science, and national prestige. Agencies such as NASA, ESA, JAXA, ISRO, Roscosmos, and CNSA shaped this public narrative. That story still matters, but it no longer

Military Space Is Driving the Growth Curve

The strongest signal in the data comes from the major military space organizations. The U.S. Space Force / DoD Space budget increased from \$15.4B in 2021 to \$26.3B in 2026, making it the largest government space organization



Source: SatNxt

captures the full picture. Between 2021 and 2026, military space organizations became some of the fastest-growing budget centers in the global space economy.

SatNxt's Global Government Space Budget & Spending Analysis Report (2021–2026), based on 44 space agencies and organizations, shows global government space spending rising from approximately \$94.4B in 2021 to US\$ 125.9 Billion in 2026, with cumulative spending exceeding US\$ 688 Billion. The headline growth is important, but the composition is more revealing: governments are increasingly treating space as a strategic layer of national security, sovereign capability, economic competitiveness, and critical infrastructure.

by annual budget in 2026. China's PLA Space Forces expanded from \$8.0B to \$10.5B, while Russian Space Troops nearly tripled from \$4.0B to \$11.7B. Together, these three organizations increased annual spending from approximately \$27.4B to \$48.5B, adding more than \$21B during the period.

This matters because overall government space spending grew by about \$31.5B over the same period, meaning these three military-space organizations accounted for roughly 67% of total budget growth. Civil programs remain large and strategically important, but the growth momentum has clearly shifted toward defense-space requirements.

Geopolitics explains part of the acceleration. The Rus-

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sia-Ukraine conflict demonstrated how satellite communications, Earth observation, intelligence, navigation resilience, and commercial space infrastructure can influence real-time operations. Intensifying U.S.-China competition has also reinforced investment in missile warning, secure communications, space domain awareness, resilient architectures, and sovereign access to orbital infrastructure.

Civil Space Remains Essential, but Its Role Is Evolving

Civil space is not losing relevance. Civil agencies remain central to exploration, Earth observation, climate monitoring, navigation, space science, launch systems, and industrial capability building. Programs such as Artemis, Copernicus, Galileo, IRIS², Gaganyaan, and Chandrayaan show that civil space remains a foundation of long-term economic and technological policy.

What is changing is the operating role of civil spending. Earth Observation remains the largest application category, reaching approximately \$30.1B in 2026, but its value now extends beyond science and environmental monitoring into defense planning, disaster response, agriculture, infrastructure, climate resilience, energy transition, and financial risk assessment.

Three Major Powers, Three Strategic Models

Major space powers are using budgets to pursue different strategic outcomes. The United States is using space investment to maintain technological leadership and operational superiority, with growth concentrated in resilient constellations, missile warning, secure communications, space domain awareness, rapid acquisition, and commercial integration. Its model increasingly combines government demand with private-sector execution.

China is building a sovereign and self-reliant architecture across launch, Earth observation, navigation, communications, exploration, and military-space capabilities. From Tiangong and lunar exploration to BeiDou and PLA space systems, its objective is full-spectrum autonomy and long-term strategic leverage.

Russia is using space budgets to preserve strategic resilience under geopolitical and economic pressure, with emphasis on sovereign communications, navigation, ISR,

"...Countries that build resilient, scalable, and commercially integrated space ecosystems will have a stronger foundation for national security, economic growth, and technological sovereignty..."

and space security systems in a contested environment.

Together, these models point to the same conclusion: space budgets are becoming tools of national positioning. The old distinction between civil prestige and military utility is giving way to a dual-use infrastructure layer where satellites, launch capacity, navigation, communications, and data networks serve both economic and strategic priorities.

The Real Question Is Capability Conversion

For policymakers and industry participants, the defining question for the next decade is not simply who spends the most, but who converts space budgets most effectively into operational capability, industrial depth, strategic autonomy, and long-term advantage. Countries that integrate civil programs, defense requirements, commercial innovation, and domestic supply chains will be better positioned than those treating them as separate policy tracks.

The future space economy will be defined less by a clean military-versus-civil split and more by convergence. Earth observation, satellite communications, positioning and timing, launch, space situational awareness, and data infrastructure are all moving toward dual-use relevance. Successful national strategies will recognize this early and align funding, procurement, regulation, and industry participation around it.

Conclusion: Space Has Become Critical Infrastructure

SatNxt's analysis shows government space spending moving from an exploration-led model toward an infrastructure-and-security-led model. Civil agencies will continue to drive science, exploration, climate monitoring, and technology development, while military organizations accelerate investment in resilience, secure connectivity, navigation, ISR, and operational architectures. Increasingly, both sides will depend on the same industrial base, orbital assets, data systems, and commercial partners.

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As space becomes critical infrastructure, the distinction between civil value and strategic value will continue to blur. Countries that build resilient, scalable, and commercially integrated space ecosystems will have a stronger foundation for national security, economic growth, and technological sovereignty.

Call to action: For government agencies, satellite operators, defense organizations, investors, and space-industry suppliers, the priority is to understand where budgets are shifting, which applications are gaining strategic weight, and how procurement priorities are evolving across major space economies. SatNxt's Global Government Space Budget & Spending Analysis Report (2021-2026) provides the detailed country-level, agency-level, and application-level view needed to assess these opportunities and risks. To explore the full dataset and understand how government space spending is reshaping the global space market, connect with SatNxt.

(www.satnxt.com)



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wary is a strategy and growth consultant with over a decade of cross-sector leadership experience spanning finance, space, education, and building materials industry. He specializes in commercial strategy, corporate planning, pricing architecture, and data-driven market expansion initiatives.

His consulting portfolio includes advising clients across India, and the USA, delivering actionable insights for geographic expansion and revenue optimization. At SatNxt, he brings a global, cross-functional perspective to market intelligence and strategic advisory engagements, helping organizations translate complex insights into scalable growth strategies. He can be reached at: aishwary@satnxt.com

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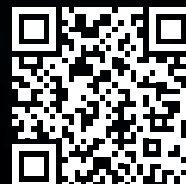
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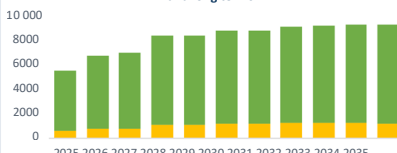
VITAL STATS



Global SatCom Capacity Supply, Demand & Operator Market Share, 2025-2035

GEO-HTS Capacity Supply by Frequency (Gbps)

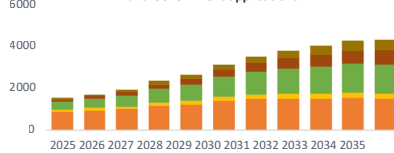
GEO-HTS: Global Supply is forecasted to saturate in mid and long terms



Source: SatNxt

GEO-HTS Capacity Demand by Application (Gbps)

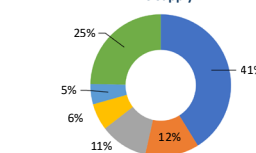
GEO-HTS: Healthy CAGR driven by Backhaul, Mobility and Government applications



Source: SatNxt

GEO-HTS Operator Market Share, 2026

GEO-HTS: Viasat continue to dominate the global GEO-HTS supply



Source: SatNxt

Non-GEO HTS Capacity Supply (Tbps)

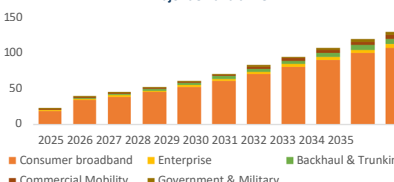
Non-GEO HTS: Massive influx of capacity as LEO players continue to expand their constellation throughput



Source: SatNxt

Non-GEO HTS Capacity Demand by Application (Tbps)

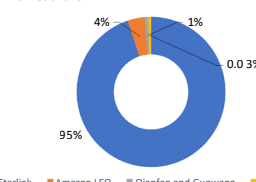
Non-GEO HTS: Consumer broadband will remain the major demand driver



Source: SatNxt

Non-GEO HTS Operator Market Share, 2026

Non-GEO HTS: Starlink dominates the supply with 95% market share



Source: SatNxt

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