

# THE ORBIT

VOL. 2

**BEYOND HORIZONS**

SOVEREIGNTY,  
INTELLIGENCE,  
AND THE NEXT  
PHASE OF THE  
SPACE ECONOMY

# ENLIGHTEN THE EARTH FROM SPACE



## From Integration to Convergence

How the Industry is  
Redefining Itself

### Karim Sabbagh

Managing Director, Space42



The satellite industry is operating on a different clock than the one it was built on. A decade ago, missions were launched with the conviction that the decisions behind them would hold for the next twenty years. That assumption is no longer valid. Development cycles are getting shorter. Subsystems are becoming smaller and more efficient. Access to space is becoming cheaper, with more options emerging across the value chain. Taken together, these shifts are for the good of the industry, changing what can be built, how quickly, and at what economics. The conceptual categories we inherited are no longer a reliable guide to the decisions before us.

Three of these in particular need rethinking. The first is sovereignty in space, a growing priority for governments. It must not, however, be confused with separation. A country can hold sovereign capability and work with the best partners in the world. The same logic applies to economic nationalism, which has a legitimate role to play. Pushed too far, it risks pulling the industry away from the globally resilient supply chains it has depended on for decades. Building the most capable system in Earth observation or satellite communications draws on components and expertise from many countries, and that foundation still holds. The second category is the distinction between integration and convergence. Integration means different systems work together. Convergence is the step beyond, where separate systems fuse into one. That is the harder process, and it is where the next generation of capability lies. The third is the long-held assumption that the strongest operators work alone. That assumption has run its course. Shared infrastructure, developed with those who share the commitment and the risk, opens possibilities that no single operator reaches on its own.

Space42 was founded with these shifts in view. Integration and convergence are embedded in our DNA, and so is working with the best wherever they are. Our aim is to create an organization that can prosecute this opportunity in a differentiated manner. That posture reflects the country we operate from. The UAE sits at the intersection of East and West, and it has long treated balanced international relationships as a source of strength rather than a compromise. We are fortunate to be based in a country that teams with like-minded partners and remains master of its own destiny.

The articles in this edition are written by the Space42 community. They span sovereignty and partnership, unified operations and convergence, AI in the shift from data to decisions, dual-use economics, and the workforce the industry now has to shape. Read them as a set of working perspectives from an industry in the middle of redefining itself, written by spacers doing more with less, and opening use cases that were out of reach only a few years ago.

Thank you for joining us on this journey. =

# BEYOND HORIZONS

Space-powered connectivity, data, and insight to help people see further, decide faster, and act with confidence

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# Powering Unified Space Systems Operations

## Sulaiman Al Ali

Chief Commercial Officer - Business, Space42



In 2025, Space42's systems helped save over 660 lives across 25 distress events, from earthquakes in Myanmar, Nepal, and Turkey to cyclones in Mozambique and floods in Nigeria. In each case, the difference between data received and aid delivered came down to connectivity, observation, and response working in unison.

The space economy is scaling quickly. Its value is estimated to reach \$1.8 trillion by 2035, as satellite communications, Earth observation (EO), and data platforms become foundational to how other industries operate. Yet the pace of capability growth has outrun the architecture holding it together, and we think that is the central problem the industry needs to confront. The real gap is between what individual systems can do and what the world actually needs them to do: work as one.

### When fragmentation becomes the bottleneck

Connectivity has expanded significantly but remains uneven, with an estimated 2.2 billion people still offline in 2025. Even where coverage is available, the environments that depend on it most (remote energy platforms, maritime corridors, disaster zones) operate far from terrestrial networks and under conditions where fragmented systems extract the highest cost.

Data generated in one layer, transmitted in another, and analyzed in a third accumulates latency at every handoff. The divide between receiving information and acting on it is where lives and assets are lost. EO workflows are typically designed for analytical depth, while

satellite communications infrastructure is optimized for coverage and throughput. Bridging the two is expensive and requires shared standards that neither was originally built to accommodate. Closing this divide requires more than better individual capabilities.

The commercial implications are stark. Mobile operators face customer churn when coverage fails in remote areas. Energy companies calculate lost revenue in hours when offshore platforms lose connectivity during critical operations. Emergency services measure the cost in response time.

**“We are building a different model: integrating satellite communications, Earth observation, and AI-powered analytics”**

### Integration as an operational model

This is why we structured Space42 the way we did. Customers today pay multiple vendors to solve pieces of the problem, then spend millions more trying to integrate the pieces themselves.

We are building a different model: integrating satellite communications, Earth observation, and AI-powered analytics under one operational framework from the ground up. No other company is constructing this combination at the level of integration we are pursuing, and that reflects a deliberate judgment that fragmented systems, however capable individually, cannot close this divide on their own.

Our integrated approach operates across the full stack. In practice, that means Thuraya and YahClick extending reach into remote and infrastructure-limited regions; the Foresight constellation providing persistent, all-weather monitoring through Synthetic Aperture Radar (SAR) imagery; High-Altitude Platform Systems (HAPS) bridging coverage between terrestrial and space-based networks; and GIQ, our AI-powered geospatial intelligence platform, translating data into decision-ready insight. When these capabilities are built around the same operational realities, they move faster, reduce handoffs, and are less prone to failure at the moments that matter most.

### Execution shapes competitive advantage

During Turkey's 2023 earthquake, SAR imagery confirmed infrastructure status at a moment when optical satellites were blinded by dust and debris. That imagery moved directly into GIQ, which generated actionable guidance while our satellite communications channels kept coordination centers connected to field teams. SAR imagery, AI-powered analysis, and satellite communications working as one system reduced coordination from hours to minutes, and the decisions made were better for it.

Capabilities remain important, but their contribution across the full decision chain matters equally, and this is increasingly visible in how customers procure and deploy solutions. Systems that integrate from the outset, reduce operational complexity, and deliver consistent performance over time are winning preference. The World Meteorological Organization reports that 60% of countries now have multi-hazard early warning systems, highlighting both how far the sector has come and the remaining gap in operational readiness. The harder question is whether those systems can detect, communicate, and act as one when the moment arrives. That is the standard against which integrated infrastructure should be measured, and it is the one we designed Space42 to meet. =



# Space Services

**The Infrastructure Nations Rely On**

**Equatys: Engineering the Architecture of  
Global Direct-to-Device Connectivity**

**Accelerating Space Technology Adoption:  
Turning National Infrastructure into  
Commercial Opportunity**

**Local Trust Powering a Global Network**

# The Infrastructure Nations Rely On

## Ali Al Hashemi

CEO of Space Services, Space42, and Chairman of the Global Satellite Operators Association



The role of satellite infrastructure in national strategy has changed. What used to support specific functions like remote operations, broadcasting, and maritime connectivity is now at the core of how governments and critical industries run. Space infrastructure underpins defense coordination, financial systems, emergency response, and the everyday mobile networks that reach citizens in their pockets. The industry has moved from the edge of national planning into its center, on a trajectory that the World Economic Forum projects will pass 1.8 trillion dollars by 2035. We have been building to that expectation for 25 years.

### A closer look at what is happening in this industry

The region we have been building in is one of the most operationally demanding environments for satellite communications anywhere in the world. Terrestrial networks cannot reach economically across its deserts, offshore energy infrastructure, and sparsely populated interiors and coastal corridors, which makes satellite the default layer of national connectivity across much of the region. The same geography hosts a disproportionate share of global trade. Roughly 30% of seaborne oil passes through the Suez Canal and the Strait of Hormuz, and the Suez alone handles an estimated 12 to 15% of world trade by volume, around 30% of global container traffic, and more than one trillion dollars in goods each year.

The regional satcom market reflects that intensity. It reached 3.74 billion dollars in 2025 and is projected to grow above 7% annually to more than 5 billion by 2030, with defense and government as the largest end-user segment and maritime applications accounting for roughly 40% of demand.

The connectivity gap underneath these figures is also real. Internet penetration across the wider Middle East sat at around 70% in early 2025, which means meaningful rural and remote coverage shortfalls remain, part of the 2.2 billion people worldwide who still remain offline. The combination of sparse terrestrial reach, concentrated trade and energy infrastructure, sovereign customer requirements, and real connectivity gaps is a particular set of conditions, and very few operators have built specifically for them at scale.

The strategy we have been executing at Space42 was shaped by a deliberate reading of this shift, and what we are building now is the operational expression of that reading proving right. I have always believed connectivity is a human right, and I carry that belief into how we run this business. Space Services is the business within Space42 that carries two of the company's strategic pillars, global leadership in non-terrestrial networks (NTN) and the trusted provision of secure connectivity. Between them, these pillars reach more than 150 markets and serve over 80% of the world's

population, operating as infrastructure that governments, enterprises, and critical industries plan around. The platforms underneath that footprint were engineered from the outset to serve every category of customer on the same infrastructure, an operating model embedded in how we build rather than how we market.

“The industry is now shifting toward direct-to-device (D2D) connectivity”

### The strategy we have been proving

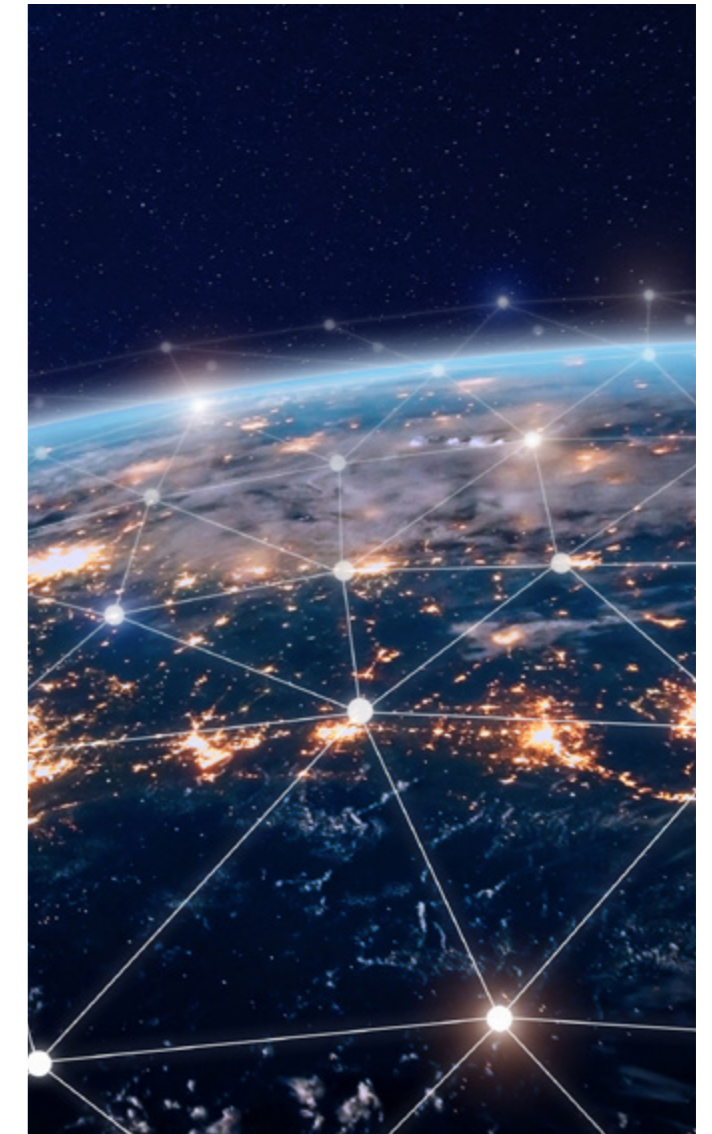
The first of our strategic pillars, global leadership in NTN, rests on a capability we have been operating for 25 years. Thuraya is one of the industry's longest-running mobile satellite networks, and Thuraya-4, one of the largest and most advanced geostationary mobile-satellite systems ever produced, extends it. Since entering service, Thuraya-4 has anchored 16 new products across the markets that have relied on this network for a generation.

The industry is now shifting toward direct-to-device (D2D) connectivity where ordinary smartphones connect directly to satellites without additional hardware or specialized terminals. This is the defining convergence of the next decade, and it is why we are establishing Equatys with Viasat. Equatys is a neutral global infrastructure venture designed as a standards-based, 3GPP-compliant D2D platform, backed by more than 100 megahertz of globally harmonized L and S-band spectrum across over 160 countries. Its purpose is to give mobile operators and governments worldwide access to space-based connectivity without proprietary lock-in, which is the architecture sovereign customers insist on and that the market will ultimately demand.

The other pillar Space Services carries is the trusted provision of secure connectivity, and it reflects a conviction about how nations should hold the infrastructure their security and economies run on.

Sovereignty is a principle we engineer for before we commercialize it. We have served as the trusted communications partner to the UAE government across its modern history, and that relationship has shaped what we build and how we build it. The infrastructure that governments depend on has to hold under every condition they may face, and the platforms have to be designed for that from the start.

A decade from now, the conversation about satellite connectivity will sound different in every language it is held in. Geography will matter less, authority over critical infrastructure will matter more, and the standards of the industry will have risen to meet what the moment demands. That future looks the same whether you read it from the UAE or from anywhere else, and the contribution Space42 intends to make toward it is already well underway. =



SPACE42

# THURAYA-4 CONNECTING WHAT MATTERS

SPACE-BASED. EARTH-FOCUSED.



# Equatys: Engineering the Architecture of Global Direct-to-Device Connectivity

## Adnan Al Muhairi

Chief Technology Officer, Space Services



Every generation of mobile technology has been defined by the same assumption: that the network is something you build on the ground, and that coverage ends where the last tower does. For forty years, that assumption held. Oceans, deserts, mountain ranges, conflict zones, and the rural plains that make up most of the earth's surface remain outside the map, and the people and assets moving through them remain outside the network.

What changes the assumption is the arrival of standards. When the 3GPP community formalized support for non-terrestrial networks in Release 17, the satellite layer stopped being a separate industry with its own devices and its own protocols.

“Equatys is being designed as a **next-generation LEO constellation** with a scalable multi-shell architecture, distributed across three altitude layers”

It became an extension of the mobile network itself, reachable by the same chipset already sitting in the phone in your pocket. This begs the question, when can the industry welcome a shared layer capable of carrying mobile signals to standard devices at a price, a scale, and under a governance model that lets the whole industry participate?

Viasat

SPACE42

Equatys, the venture that Space42 and Viasat are in the process of establishing, is our answer to that question. It is designed as an independent, neutral, shared infrastructure platform that extends 3GPP-based connectivity to the billions of users, devices, and assets underserved by terrestrial networks. Getting it right requires reconciling four design problems that have historically pulled satellite systems in different directions: economics, spectrum, interoperability, and sovereignty. The architecture we are building treats all four as the same problem.

## Economics first: designing for mass-market adoption

Cost has always been the binding constraint in satellite communications, and it is the reason Direct-to-Device (D2D) has remained a niche service on specialized handsets for as long as it has existed. Until the Space Resource Unit (SRU), the cost of one unit of capacity delivered from orbit, approaches the economics of terrestrial wireless, D2D will continue to live on the edges of the consumer market rather than inside it.



Consumer research puts the threshold squarely within reach. A GSMA Intelligence survey of 10,468 mobile users across 10 countries found 67% interested in D2D services, more than 55% willing to pay extra for them, and 90% wanting full coverage wherever they go. That is a narrow window on price, and it dictates almost every architectural decision we make. It is why Equatys is being designed as a next-generation LEO constellation with a scalable multi-shell architecture, distributed across three altitude layers. Latency, coverage, and capacity can be optimized independently across altitudes of 500 km, 640 km, and 1,023 km, rather than forced into a single compromise. The SRU cost then declines over time through four structural drivers: rising utilization as load factors grow, multi-tenant demand aggregation and spectrum pooling, constellation densification that lifts capacity per orbit, and successive gains in satellite efficiency and manufacturing.

EQUATYS

## Spectrum as the foundation for global scale

The discipline of starting with spectrum, and then building satellites around it, is what distinguishes infrastructure from experiment. Equatys has the technical capability to operate across more than 100 MHz of globally allocated and coordinated MSS spectrum, beginning with the L-band and S-band resources that Space42 and Viasat bring to the venture.

Unlike terrestrial spectrum, which is fragmented by national licensing regimes and has to be renegotiated at every border, MSS spectrum is internationally coordinated through the ITU across more than 160 nations. That coordination is what turns a regional network into a global one. The same handset that works in Abu Dhabi can work in Jakarta or Lagos on the same spectrum and network, without the administrative and commercial layers that usually sit between a traveling user and their service.

The overarching commercial architecture is what we call “bring your own spectrum.” Each partner retains its spectrum rights and deploys them through Equatys system resources to generate capacity at substantial cost savings, much as mobile network operators already use leased space on shared terrestrial towers. The logic that made terrestrial mobile affordable to build at scale now applies to orbit.

“The same handset that works in Abu Dhabi can work in Jakarta or Lagos on the same spectrum and network”

### Interoperability: integrating two network domains

Frictionless mobility is the design requirement. The user should move between terrestrial and satellite coverage without noticing, dropping to the satellite layer only when the ground network is unavailable and returning to it the moment it is.

Equatys is being built from the ground up on 3GPP Non-Terrestrial Network Release 17 and beyond, which means it is a true extension of mobile infrastructure rather than a parallel network bolted onto it. The transparent payload design keeps the operator's core network in their own hands. Authentication, billing, and service logic remain unchanged. Real-time, AI- and software-defined resource management across the system, routes spectrum, beams, and capacity in fractions of a second. The handover is therefore seamless without disturbing the commercial relationship between the operator and its subscribers.

### Sovereignty: enabling national jurisdiction within global infrastructure

Over time, I have come to see sovereignty as a gating condition rather than an optional feature. Any network that cannot accommodate national oversight faces structural barriers to adoption in every market that treats connectivity as critical infrastructure, as most markets now do.

Our response is to design the platform so that national and international infrastructure stop being a choice. Partners can deploy sovereign gateways within their own territory. Nations can reserve capacity for national use as needed. Assets contribute to global capacity by default and can be governed locally when the situation demands it. This is the first architecture I have worked on where a country can participate in global infrastructure without surrendering the ability to govern it at home, and where that participation is engineered into the system rather than negotiated around it.

The Tower Co. model on which Equatys operates is designed from day one to welcome additional co-founders, satellite operators, and spectrum holders as the ecosystem takes shape. We are building the universal layer that the industry has not yet had.

### From architecture to execution

The market signal for getting this right is sharp. 50% of consumers surveyed said they would switch mobile operators to access satellite-enabled services, which puts commercial pressure on every MNO without an NTN partner. Equatys lets them answer that pressure without building a constellation of their own.

What I keep coming back to is that the choices we are making now in the Equatys architecture will still be visible in the network a decade from now. Every orbital plane, every payload iteration, every gateway deployment is a long-lived decision. Our job as engineers is to make sure those decisions compound in the right direction, toward a system that is cheaper, more open, and better aligned with both standards and sovereign interests than anything the satellite industry has built before. When we do that, Equatys becomes the default infrastructure behind the next decade of mobile services, and the assumption I started with, that coverage ends where the last tower does, finally stops being true. =



A new global satellite constellation connecting your **everyday devices**



**Globally Harmonized**  
L- and S- Band Spectrum

# Accelerating Space Technology Adoption:

## Turning National Infrastructure into Commercial Opportunity

### Jassem Nasser

Chief Growth Officer, Space Services



In recent years governments have invested heavily in space infrastructure to secure strategic autonomy and national resilience.

With this foundation in place, the private sector now has the opportunity to draw significant commercial value from space-based solutions.

Our industry's challenge therefore shifts to encouraging enterprises outside of the sector to use such capabilities to expand operations and address inefficiencies. Space technology can take on the role of an economic multiplier across capital allocation, supply chain management, agriculture, logistics, and energy, when supported by clear procurement, integration, and validation processes.

#### From asset deployment and education to market activation

In 2024, the global space economy achieved 9% growth in public sector investment, while the private sector investment increased by 20%. The evolution of space infrastructure from state-led programs into commercially integrated systems drives increased investment. Dual-use demand plays a critical role in expanding asset utilization and strengthening long-term economic sustainability. Effective use across day-to-day operations is where companies will benefit most, and where application becomes commercially meaningful to the space sector.

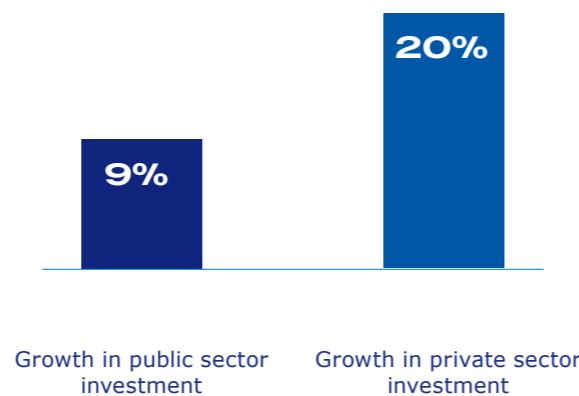
Education of private institutions is ongoing, take for example the United Kingdom's 'National Space Industrial Plan' and Southeast Asian markets inviting businesses to utilize sovereign

space capabilities through transfer agreements. The transition is also underway within the UAE's National Space Strategy 2031, dedicated to establishing the nation as a hub for space innovation, investment, and commercial activity.

#### Governments can help close the adoption gap

Market leaders recognize the value of satellite data. However, when initial interest must advance toward investment, workflow change, and institutional commitment, this is where progress stalls. Regulators can accelerate adoption by reducing friction through three practical avenues.

Global space economy growth drivers 2024



The first is procurement clarity. Policy makers that provide standardized service evaluation criteria and established pre-qualified supplier registers will reduce due diligence timelines for procurement. Enterprises evaluating space-derived services need frameworks that reflect their operational priorities: consistent data availability, resolution and revisit frequency, latency, and long-term service guarantees. Often in our engagements with private entities, we sit across from procurement teams that have no prior exposure to the space sector. Clear administrative direction will prevent decision-makers from defaulting to the familiar.

The second is systems integration. Satellite insights deliver value when they connect to the systems that enterprises already use. Risk engines, supply chain platforms, asset monitoring systems, financial models, and compliance workflows all require defined pathways for space-derived data. Establishing such pathways early shortens deployment timelines. Alternatively, pilot programs run by regulatory agencies can offer reference architectures for the private sector to follow. An example that comes to mind is our partnership with Abu Dhabi's Department of Municipalities and Transport (DMT). Together we are developing AI and geospatial tools including digital twins, to make infrastructure management, and urban systems more efficient in the planning stage. Entities that work with the DMT can then look to this model as a reference of how similar technologies can be adopted within their workflows.

The third is performance validation. Space-enabled solutions need to demonstrate impact within defined performance cycles, and national authorities can support further by creating frameworks that enable measurement. Reduced loss ratios, improved yield per hectare, lower inventory volatility, faster claims settlement, and less downtime are the outcomes that turn initial interest into sustained implementation. To this end, alongside Abu Dhabi's Department of Energy, we are deploying satellite imagery, SAR data, and AI-driven geospatial insights to strengthen resource monitoring, operational efficiency, and resilience across the Emirate's energy and water infrastructure.

#### Data advantage in practice

Having a defined problem separates the adopters from the observers. In agriculture, the questions we are asked include: how can space technology

assess seasonal yield variations and where is value lost? SAR data analyzing soil moisture, crop stress, and seasonal patterns becomes valuable in practice when embedded into farm management and forecasting tools. These indicators provide operators with the visibility to act before a poor season becomes irreversible.

Logistics and maritime companies face different challenges. Assets sit idle, routes carry hidden risk, and the data needed to act often arrives too late. To tackle this, persistent monitoring and weather-linked analytics fed into fleet dashboards in real time can change how decisions are made.

Insurance providers demonstrate the value of independent and precise data most effectively. Insurers need to quantify exposure they cannot inspect directly and settle claims without taking on greater risk. High-resolution monitoring connected to risk assessment systems brings clarity where there was only estimation, improving accuracy and response times. Across all sectors the value lies in the decisions the data enables and how organizations can get there systematically.

#### The commercial bridge: turning capability into adoption

The path from interest to deployment across industries is shorter than most enterprises assume, provided the right conditions are in place from the start. The most successful deployments I've supported include strong procurement frameworks, reference pilots, and scalability.

Space42's partnerships with government bodies demonstrate what this looks like when structured correctly from the outset. Agreements with Abu Dhabi's Department of Energy and Department of Municipalities and Transport are an example of how early regulatory alignment means that integration can follow a defined structure. The transition from pilot to programs is considered well before deployment. The model is replicable and reflects the approach the UAE's space strategy enables across the broader economy.

Doubling the space economy requires industries that leverage what is already available and convert it into productivity, as opposed to launching more assets. The measure of success is shifting from what has been built to how it is being used. =

# Local Trust Powering a Global Network

## Elmuiz Saad

Senior Vice President, Commercial, Space Services



Elmuiz Saad's first move in any country he visits is always the same. He pulls out his Thuraya handset and makes a call. It's a habit, as well as a point of pride. A clean signal means the system is doing its job, and in the past twenty years, he has enjoyed connecting instantly when on the go.

His confidence reflects the strength of Thuraya's commercial network, built over two decades. Now a subsidiary of Space42, its reach into markets across Europe, Africa, Central Asia, and the Middle East, is the result of sustained local presence in each, long-term partnerships, and trust built on the ground.

In the conversation below, Elmuiz outlines how this connectivity operates at scale, and what it enables.

**Thuraya has been operating in some of the world's most remote and complex markets for over 20 years. What does it actually take to build a commercial network that reaches those environments reliably?**

Maintaining an on-ground presence and trust-based relationships is what set us apart in the last two decades. We operate through 146 active service partners who work in local time zones, price in local currencies, and understand their regulatory environments in ways we cannot manage centrally from Abu Dhabi. Together, they create nearly 1,500 employment opportunities in the markets we serve. We also maintain over 370 MNO roaming agreements globally, which means a subscriber in almost any country

can insert their local SIM card into a Thuraya handset and use it in satellite mode without any setup beforehand.

When you consider our footprint spanning the Middle East, Asia, and all of Africa, alongside more than one million satellite phones sold since 2002, you can see the scale of what we have built. Our commercial model was designed to be flexible, across different regulations, ways of working, and operational realities. While the network meets global standards, its success comes down to engaging local consumers based on an understanding of how each market functions.

**Over your career, what is the call or the moment you find yourself coming back to?**

One moment stays with me to this day. Seven Filipino fishermen whose boat was swept off course and drifted into Indonesian waters were located using a Thuraya XT-LITE satellite phone and brought home safely. We talk about how our connectivity has the potential to save lives, but seeing the families reunited at a ceremony in Manila really put my work with Thuraya into perspective. This has since fueled my passion to push the boundaries of our markets and capabilities.

That rescue is one of many. In 2025 alone, Space42-supported connectivity helped save over 660 lives across more than 25 distress events worldwide. That impact comes from sustained presence in places where alternative infrastructure is limited or unavailable.

**Those are powerful examples of emergency response. How does that same network go on to support entire industries?**

The reach that helped find a crew in distress also powers entire industries. In Vietnam, we connected over 12,000 fishing vessels to our MarineStar program as part of a government-mandated Vessel Monitoring System. We built it with a local mobile operator to handle everything from compliance and environmental monitoring to voice calls for crew welfare. Crews stay on their local SIM numbers, which keeps costs down for fishing families. It has since become the leading solution in the country's fisheries sector.

We have a history we can build a future on. The infrastructure we have been talking about, that finds fishermen and connects entire fleets, is the foundation for the next generation of connectivity. No one is better placed to deliver that than us. Space42's knowledge of local markets, vast network of distributors, and longstanding relationship with Mobile Network Operators around the world fully supports our upcoming Direct-to-Device ventures. It is rooted in 25 years of experience in showing up for the people and places that need it most. =

**"In 2025 alone, Space42-supported connectivity helped save over 660 lives across more than 25 distress events worldwide"**

This model shows up across our operations. We support satellite-enabled telemedicine in field hospitals in South Sudan, connectivity for rural healthcare in Nigeria, and high-speed links for schools across South Africa. With the commercial rollout of Thuraya-4 in 2025, we are working to advance this reach further. The same network that supports a distress call at sea becomes the operating platform for national industries on land. That continuity is what gives the model its strength.





# Smart Solutions

**Geospatial Insights: Keeping a Growing  
Population Resilient**

**Dual-Use by Design: The Case for Capital-  
Efficient Sovereign Systems**

**What Happens When AI Runs the Geospatial  
Workflow**

**HAPS Enters the Commercial Era**

**Building Technical Sovereignty into the SAR  
Value Chain**

# Geospatial Insights: Keeping a Growing Population Resilient

## Hasan Al Hosani

CEO of Smart Solutions, Space42



The industry I have worked in for most of my career spent decades solving the problem of observation. Getting a satellite into orbit, pulling useful imagery from it, putting that imagery in front of an analyst. That problem is largely solved. Satellites, High Altitude Platform Systems (HAPS), aerial surveys, and ground sensors produce more geospatial data every day than any institution can process. AI has added an interpretation layer that was not available even five years ago. What is yet to be solved is execution: the distance between the intelligence a system produces and the decision a customer can make from it. Most of the world still lives inside that space. Public sector research consistently shows most leaders understand the value AI can deliver, while only a small fraction have brought it into daily operations. The gap between those two realities is the defining challenge of this industry, and it is the one Smart Solutions is solving for.

The two strategic pillars we operate inside Space42 exist to close it end-to-end: preferred partner for premium geospatial data, and global leader in geospatial intelligence AI platforms and services. The first assembles the full picture from plural sensing. The second turns it into decision-ready intelligence. Together they are dual-use by design, serving defense, government, and enterprise customers from a single architecture. This is the operating model the current environment rewards, and it is the one we have structured the business around deliberately.

### A more demanding operating environment

Global defense spending reached USD 2.63 trillion in 2025, according to the International Institute for Strategic Studies, the continuation of a decade of consecutive annual rises. The same trend holds for global infrastructure, where investment continues at historic levels. Trade corridors and energy flows operate under pressures that compress decision timelines, and the information environment around every major decision is more contested than at any point in a generation. Cities compound the picture. Around 45% of the world's 8.2 billion people now live in urban areas, and the megacities among them are managing traffic, water, power, and safety at scales no previous generation of planners has faced.

The common thread is that every serious decision now requires intelligence that is continuous, trusted, and acted on at speed. The governments and enterprises that have already developed that capability are setting the pace; the ones still standing it up are discovering how quickly that gap widens once the pressure on their decisions rises. Recent industry discourse has centered on the integration of command, control, and communications into unified platforms, a direction now broadly accepted across defense and civilian domains. The underlying principle is older and simpler: for any nation or enterprise that carries responsibility for the safety of its people, its infrastructure, or its operations, capability built ahead of need is the foundation everything else rests on. This is the discipline the UAE has practiced for years, and what we are building at Smart Solutions reflects that same discipline applied globally.

The commercial case is running in parallel with the strategic one. The global geospatial analytics market is growing into the hundreds of billions of dollars over the decade ahead, and the fastest-growing segment inside it is streaming and real-time analytics, which is forecasted to grow at 13% annually through 2030. That segment is the industry's own signal that customers are done buying imagery and starting to buy decisions. Capital is following the same path, with dual-use Earth observation and national security emerging as the lead investment themes of the past five years the defining unit of value is shifting underneath the industry: from sensor to system, from data to decision, from vendor to partner. That shift describes exactly what Smart Solutions was set up to do.

### From sensing to decisions

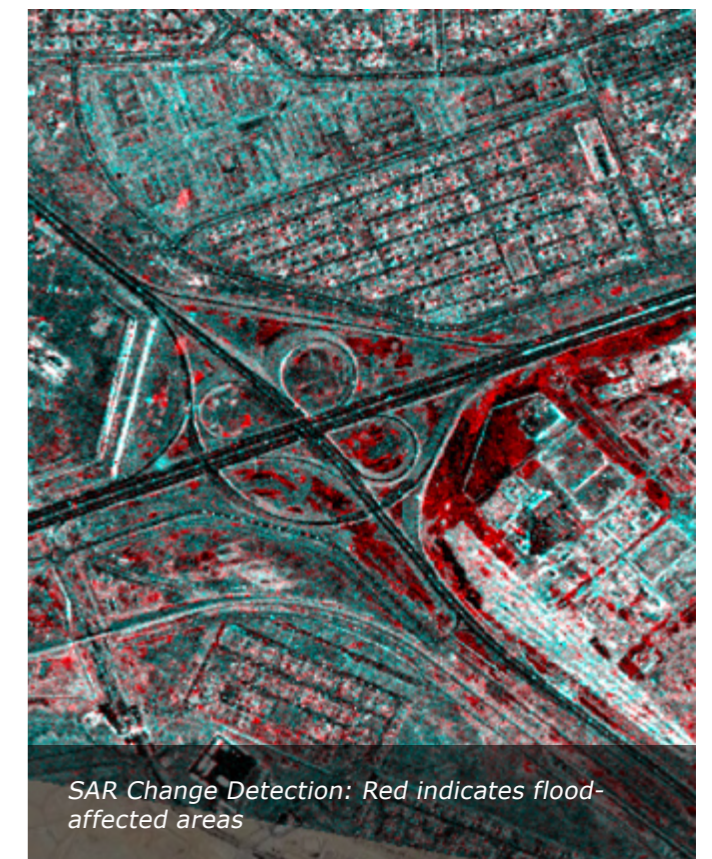
A single sensing modality gives any customer a partial view. The design of modern geospatial intelligence has to be plural: space-based Synthetic Aperture Radar (SAR), near-space imaging through HAPS, aerial survey, and ground-based sensing, fused with third-party and open sources where they add value. Smart Solutions operates across that stack. The Foresight constellation delivers SAR imagery at 25-centimeter resolution, with Foresight-3, -4, and -5 assembled and tested in Abu Dhabi before launching in November 2025. Mira Aerospace's ApusNeo18 HAPS platform, commercially mature as of 2026, anchors the near-space layer. True fusion across this many sensing layers remains a high-end capability held by a small number of operators globally, and it is what allows Map Africa, our commitment to extend foundational geospatial data across 54 countries, to reach the scale and depth it does.

Plural sensing produces volumes of data that analyst operations built for the previous era cannot process within the time window a decision requires. AI is what turns that volume back into something a customer can act on. GIQ, our AI-native geospatial intelligence platform, is designed for this role. It takes multi-source data from our own assets and third parties, applies machine learning to identify patterns, changes, and anomalies, and delivers the output in a form that an operator can act on directly rather than reinterpret. GIQ is now globally available on the Microsoft Azure Marketplace, and its design allows customers to train the platform on their own data while retaining full governance over what leaves their environment.

This pillar is global in ambition because the customers for AI-native geospatial intelligence sit across every region. Our model lets them build on GIQ without handing over the data or the decisions that run on it, which is what makes the platform genuinely exportable.

Geospatial intelligence is inherently dual-use at the data layer. The same continuous visibility that tracks commercial shipping tracks maritime threats. The same AI that detects change in agricultural land detects change along a border. What varies across domains is delivery, governance, and the decision workflows the intelligence feeds into, and Smart Solutions is designed to handle all three from a single architecture.

That same capability is on its way to becoming operational infrastructure: continuous, integrated into the systems that run governments and enterprises, delivered at decision speed. That is where the industry is heading, and Smart Solutions is moving there ahead of the curve. Our commitment is to meet customers wherever they are on that curve, to provide the plural sensing, the AI that interprets it, and the governance model that allows the intelligence to become action. That is the work, and the next few years of it will define what Space42 contributes at global scale. =



SAR Change Detection: Red indicates flood-affected areas

# Dual-Use by Design: The Case for Capital- Efficient Sovereign Systems

## Viktor Stoyanov

Chief Operating Officer, Smart Solutions



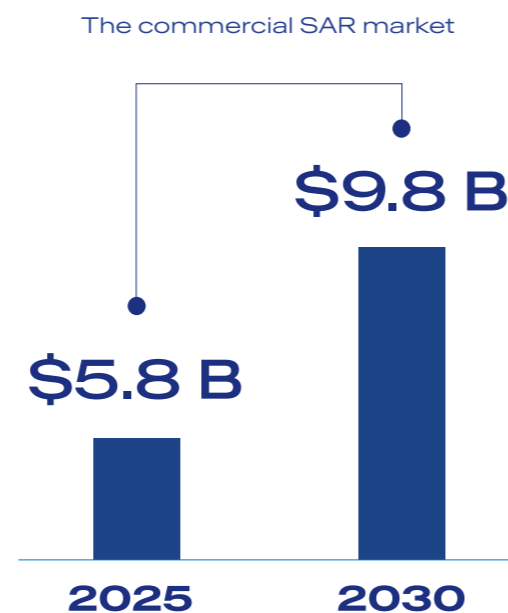
Governments that default to procuring and owning satellites dedicated to their own use are paying a premium for an outcome that a dual-use model can deliver at lower cost and lower operational burden. A shared architecture works better, and the industry is transitioning toward this model.

Sovereign space systems are heavy capital-intensive programs. An end-to-end Low Earth Orbit (LEO) Earth observation constellation of satellites, with its ground segment, data infrastructure, and replenishment schedule, runs into the hundreds of millions of dollars, accounting for the bill recurring every three to five years as satellites reach end of life and must be replaced. Under the conventional model, a government funds the majority of that cost and takes ownership, bearing the full weight of a global asset to serve a predominantly local need. The mismatch is structural: a LEO constellation orbits the entire planet, while a national government is primarily interested in its own territory and a defined area of interest. A superior capital-efficient construct now exists, and a growing number of programs are proving it works.

### The case for shared economics

A dual-use program, designed from the outset to serve a government anchor client while commercializing spare capacity to international buyers, delivers the same sovereign outcomes

at a materially lower cost. When provided on a technically advancing platform, the operational burden can be managed by the operator rather than the end client. Both parties benefit, and the program as a whole performs better than either could achieve alone.



The cost argument is the most immediate. In a dual-use structure, the government defines its operational requirements, commits offtake as the anchor client, thus underwriting a substantial, yet not the full share of the program cost. The commercial operator then sells remaining global capacity internationally, with that revenue offsetting the government's exposure. The government's effective cost per unit of sovereign access whether defined by price per image or price per satellite pass, falls in direct proportion to how successfully the operator commercializes the constellation. The math is compelling. Within this structure, the government's share of total program cost can reach as low as 65-70%, with the operator absorbing the remaining one-third through commercial sales. That balance gives the government a price point it could not achieve under full-ownership procurement, while giving the operator the scale to build a globally competitive platform.

The technical argument is less discussed but equally important. Traditional government procurement locks a program to a static specification at the point of contract award. For LEO systems, this creates a missed opportunity – while the replenishment cycle that makes ownership so expensive, it is also the natural moment for improvement. Resolution, geoaccuracy, satellite lifespan, agility, onboard processing: a number of these performance parameters may improve meaningfully over a five-year satellite lifetime. A commercial operator, competing in a global market, is under continuous pressure to incorporate those advances at each refresh. Each replenishment cycle becomes an upgrade cycle. A government that owns its system statically misses the incentive for compounding improvement; a government served under a commercial service model benefits from it without bearing its full development cost.

The operational argument follows from the same logic. A Ministry of Defense or national intelligence agency's expertise lies in mission outcomes. It has no particular advantage in running a satellite operations center, managing the mission ground segment, or operating a user operations center, with its underlying infrastructure and personnel. Under a service model, the operator takes on this burden. The government's institutional focus returns to the work it does well: tasking the system (through the operator), receiving the data, and acting on the intelligence it produces.

A further benefit is socioeconomic. Managing international commercial demand requires people, partnerships, and industrial infrastructure, and the jobs, export revenues, and expertise that flow from a commercially active constellation stay in-country. Capacity that can also be made available for disaster response, climate monitoring, or crisis relief produces diplomatic value alongside it. Government-only programs, which generate no external revenue by design, cannot deliver the same return.

“The logic of shared economics extends beyond the relationship”

There is also a benefit that receives less attention in procurement conversations: transfer of technology and transfer of knowledge. Under a direct business-to-government ownership model, the transfer of knowledge and technology from a foreign supplier to a national defense entity runs into significant regulatory and diplomatic friction. Even if such transfer is accomplished, the ROI is limited. A government is unlikely to pursue R&D programs, satellite manufacturing, and commercial partnerships to develop and deploy foreground IP solutions. The same transfer flowing through a commercial space company as the operating intermediary is structurally more achievable. At Space42, the Assembly, Integration and Testing facility we operate in Abu Dhabi is a deliberate expression of this logic, and one I consider central to how we build sovereign capability. Technical expertise and manufacturing capability created in-country, through our commercial partnership with ICEYE, generates invaluable knowledge that stays here. Through this structure, a government can achieve superior sovereign technical expertise, generated organically and through transfer.

### From dual-use to triple-use

These arguments are being validated in practice, and Space42's Foresight Synthetic Aperture Radar (SAR) constellation is our clearest example. Foresight was designed as a dual-use program from its inception: government-anchored to serve sovereign Earth observation requirements, and commercially extended to serve international demand for SAR data in disaster response, maritime monitoring, and infrastructure surveillance. With five satellites now in orbit and two more scheduled for launch by 2027, the program is demonstrating what this model looks like at operational scale. The constellation serving the UAE today will be technically superior in 2027 to what it is now. The global SAR market is projected to grow from \$7.45 billion in 2026 to \$18.81 billion by 2034, a compound annual growth rate of 12.3%, and that expansion is being driven in large part by programs built on this dual-use logic.

Looking further ahead, the logic of shared economics extends beyond the relationship between a government and a commercial operator into what can be described as triple-use platforms. Two governments with non-overlapping areas of interest, geographically distant and diplomatically aligned, could co-fund a single constellation.

Each would reserve priority access over its own territory; capacity above their respective footprints would be shared or commercialized. The result is a platform with lower unit cost, greater technical ambition, and stronger institutional ties between the co-funding nations. Programs already in development could subsequently be opened to additional government participants on this basis. This is a natural next step in the evolution of how sovereign space capability is structured and financed, and one Space42 intends to explore as our programs mature.

The conventional ownership model persists because it is familiar, and because "we own our satellites" carries a kind of institutional reassurance of direct control. But ownership is a means, not an end. What governments require is reliable, sovereign, priority access to high-quality intelligence over their areas of interest, delivered on a platform that improves over time, at a competitive cost. A well-structured dual-use program delivers all of that. The model can be extended further between friendly nations with geographically distinct interests. A service construct gives governments a choice they have not always had: own the burden, or own the outcome. =



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# What Happens When AI Runs the Geospatial Workflow

## Dr. Prashanth Marpu

Chief Technology Officer, Smart Solutions



Every time we are faced with an emergency or natural disaster, the first question is always the same: how quickly can we understand what is happening? For most organizations, the honest answer is: not quickly enough, and the reason is rarely the quality of the AI. It is the gaps between systems, the points where data moves from one platform to another and momentum is lost. Effective workflow design powers responses, turning satellite and sensor data into a clear picture of the crisis at hand. By using Artificial Intelligence (AI) as a unifying factor through the data evaluation chain, we can accelerate action.

As operational pressure increases, the value we can provide depends entirely on timing. Today, satellite radar maps through cloud cover, AI models flag damaged infrastructure against historical baselines, and within hours, decision-makers know where to send help first. Five years ago, that sequence would have taken days. Now, it happens within a single operational window. The organizations closing this gap are those that have redesigned the process itself, not just the tools within it.

### The bottleneck lies in fragmented workflows

AI has improved core geospatial tasks such as optimal data acquisition, detection, classification, and change analysis to provide semantic understanding in a timely manner. Advancements in weather forecasting show that AI models can generate 15-day forecasts in minutes, compared to hours for traditional models. The same compression of time-to-insight is spreading across geospatial use cases.

Yet in practice, without AI bridging process gaps, decisions still face friction. What this looks like in practice is an AI model identifying an anomaly. The analyst validates it using another tool, checks historical data in a separate system, and compiles outputs elsewhere. This takes time we do not have, as even a few hours of early warning can reduce damage from hazardous events by 30%.

Research reflects this gap. Companies that redesign workflows around AI are nearly three times more likely to report meaningful business impact than those that layer AI onto legacy processes.



Companies that redesign workflows around AI are nearly

# 3 times

more likely to report meaningful business impact than those that layer AI onto legacy processes.

“Without analyst context, detection is just a flag”

### Integrated systems produce decision-ready intelligence

The shift happens when AI becomes part of the insight pipeline itself. In an integrated environment, ingestion, model execution, validation, and reporting operate continuously. The analyst's role moves from assembling data to interpreting and validating outcomes.

This is the principle behind Space42's GIQ geospatial intelligence platform. Developed in partnership with the United Arab Emirates Space Agency (UAESA), it brings together multi-modal data, including optical, SAR, thermal, and LiDAR, within a single environment where users can train, validate, benchmark, and deploy models. It also allows users to design their own workflows, through a no-code interface, placing control with those closest to the problem.

Without analyst context, detection is just a flag. When linked to historical baselines, confidence levels, and related observations, it becomes something a decision-maker can act on. Knowledge graphs take this further by connecting events, locations, and timelines across datasets, turning isolated outputs into structured situational awareness that shortens the path from raw information to action.

### Impact becomes clear under operational pressure

In past flood events, GIQ used SAR imagery to map water levels despite poor visibility. As conditions improved, optical imagery was added automatically. AI models tracked changes over time and compared results against historical baselines. Within minutes, clear, validated intelligence on the extent, severity, and priority response areas was delivered.

This example demonstrates how analysts can focus on evaluating output rather than assembling it. When analysts design workflows themselves, they can adapt processes to the demands of each situation, improving both speed and relevance.

### Trust defines the next phase of geospatial AI

The measure of a strong geospatial insights engine is how effectively it allows analysts to focus on judgment. Confidence must be built into the workflow through transparency about how outputs are generated, traceability that lets analysts audit the path from data to conclusion, and validation mechanisms that make it possible to intervene when judgment says otherwise.

The systems that earn operational trust combine speed with clarity and keep the analyst in the loop. At Space42, redesigning workflows around these principles is the work we are focused on, because the organizations that get this right will be the ones turning data into decisions at the pace operations demand. =



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# HAPS Enters the Commercial Era

## Khaled Al Marzooqi

CEO of Mira Aerospace



For decades, governments and operators have asked the same question about High Altitude Platform Systems (HAPS): when will HAPS move beyond demonstration flights to operational deployment? HAPS have always offered a clear proposition. Positioned between satellites and terrestrial infrastructure, they deliver persistent coverage, real-time flexibility, and high-value intelligence. For years, potential outpaced execution.

That gap is closing. Advances in platform engineering, regulatory approvals, and operational deployments are moving HAPS from experimental technology to commercial service. The focus has shifted from capability to deployment, and the market is responding. Forecasts project 20% annual growth through the end of the decade.

### A distinct layer in the connectivity and intelligence stack

HAPS strategically bridge the gap between two established layers: space-based systems and terrestrial networks. Operating at altitudes up to 20 kilometers in the stratosphere, above commercial aviation and weather systems, HAPS provide continuous, line-of-sight coverage across regional geographies. Satellites provide global coverage and persistent insights but operate within fixed orbital paths. Terrestrial networks deliver high-capacity connectivity yet depend on infrastructure that is difficult to extend across remote or disrupted areas. HAPS occupy the middle ground and can be repositioned as operational needs evolve.

Economics matter as much as capability. Building a satellite constellation takes billions in capital and years to deploy. Extending terrestrial infrastructure across remote terrain is often prohibitively expensive. HAPS deliver persistent regional coverage at a fraction of both costs, with faster deployment and greater operational flexibility than either alternative. The cost structure offered by this distinct operational layer, makes advanced monitoring and connectivity accessible to organizations that cannot justify satellite programs or infrastructure expansion.

### HAPS add value across all environments

HAPS create value through versatility and operational flexibility. The same platform can serve rural connectivity, precision agriculture, infrastructure monitoring, or disaster response. Defense applications leverage persistent coverage for border surveillance and national security missions. What makes HAPS particularly valuable is their ability to be retrieved, reconfigured with different payloads, and redeployed for entirely different missions. A platform monitoring agricultural conditions can return for payload reconfiguration and redeploy for telecommunications or surveillance applications.

HAPS support dual-use applications across commercial and government sectors. Platforms can carry communications payloads for broadband connectivity, imaging sensors for agricultural monitoring and infrastructure inspection, or surveillance equipment for border security. This versatility allows different customers to deploy similar platforms for distinct operational requirements. Combined

with continuous aerial coverage through electro-optical and infrared imaging and AI-enabled analytics, HAPS provide real-time intelligence that improves decision-making and enables better coordination across response teams.

In December 2025, Mira Aerospace conducted Europe's first HAPS flight under civilian operational authorization. Executed using the ApusNeo18 platform for Telespazio Ibérica as part of Spain's ISSEC wildfire response program, the mission demonstrated that HAPS can operate within a mature civilian framework, combining regulatory compliance, operational discipline, and a viable deployment model. For enterprises and national partners evaluating stratospheric platforms, this removes a significant procurement barrier. The authorization confirms that HAPS can integrate into established aviation systems and meet the governance requirements of operational environments.

### HAPS work best as part of a system

HAPS deliver maximum value when integrated with existing infrastructure, not deployed as standalone solutions. The introduction of stratospheric platforms advances the capabilities drawn from satellites and terrestrial networks by adding a persistent, flexible regional layer. Together, these create a complete operating model with HAPS acting as force multipliers that strengthen situational awareness and support more effective ground operations.

The Spain deployment reflects this approach in practice. Integrated into a national response framework, the platform contributed real-time data to coordinated operations on the ground. This is how HAPS create value: as part of a layered architecture that combines orbital coverage, stratospheric persistence, and terrestrial capacity.

**"In December 2025, Mira Aerospace conducted Europe's first HAPS flight"**

Commercialization depends on operational discipline and realistic expectations. Atmospheric conditions influence mission planning. Regulatory frameworks continue to evolve. Payload capacity requires efficient sensor design. These constraints are not limitations but design parameters that enable mission-specific reconfiguration without full platform replacement. Progress in civilian authorization is therefore significant. It reduces uncertainty, establishes clearer pathways, and enables more confident procurement decisions.



## A new operating model for deployment

The industry is entering a new operating model for stratospheric platforms. HAPS are moving beyond experimental deployments into operational workflows where regulatory structures, proven performance, and measurable value converge. The next phase of adoption will be shaped by platforms that perform reliably in real environments, align with aviation frameworks, and deliver clear economic benefits where existing infrastructure leaves gaps. Mira Aerospace serves as an example of market readiness, with the ApusNeo18 offering a payload agnostic, competitively priced solution, already authorized in European airspace. The opportunity is clear: integrate HAPS into operational workflows across industries and public services where persistent and flexible coverage improves commercial and economic outcomes.

This is the thinking behind ApusNeo18's architecture, designed to be adaptable across sectors and compatible with partner technologies spanning real operating systems. HAPS have proven themselves in controlled tests. The commercial era begins when platforms operate reliably in real environments, regulations support deployment, and customers treat stratospheric coverage as standard infrastructure. We are entering that phase now. =

“The opportunity is clear: **integrate HAPS into operational workflows across industries and public services** where persistent and flexible coverage improves commercial and economic outcomes”



# Building Technical Sovereignty into the SAR Value Chain

## Khalid Al Awadhi

SVP, Earth Observation Systems, Smart Solutions



As more countries invest in SAR capability, the question is shifting from whether to acquire a constellation to how much of it they truly grasp. That understanding is built at a specific stage: assembly, integration, and testing (AIT), where system performance is verified before a satellite reaches orbit and where engineering judgment, once developed, stays in-country.

Having spent my career connecting design and operations, it is clear that while satellites can be manufactured globally, the stage at which their design is verified and validated for mission use carries a different weight. It is where the practical judgment required to sustain a program is paramount.

This is why we built the Space42 Space Systems facility in Abu Dhabi, backed by the Abu Dhabi Investment Office (ADIO), and established a joint venture with ICEYE to bring SAR satellite technology into the UAE while drawing on established manufacturing expertise from Finland.

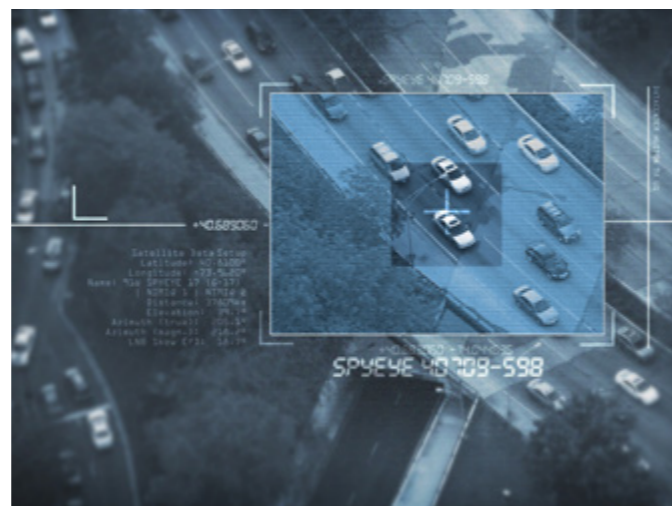
### Hands-on involvement is the bridge to design readiness

When AIT is conducted in your own environment, it changes how decisions are made across the mission lifecycle. Our engineers are involved in integrating the different subsystems of the satellite, its performance tests, payload calibration, and qualification for flight. They see where margins hold, where tolerances tighten, and what matters most once hardware is exposed to real operational demands.

Direct control over testing strengthens engineering judgment, forming the foundation of long-term capability, and allowing teams to act on their own data quickly. In a field where precision and timing define outcomes, teams that master the testing process can move faster.

As our engineers calibrate payloads and run technical qualification on Foresight missions from the Abu Dhabi facility, each program builds cumulative insight, strengthening confidence in on-orbit performance.

Over time, this direct exposure expands what teams deliver. Engineers with AIT experience identify where designs can be refined and where mission requirements can be extended. This progression separates organizations that operate satellites from those that shape the next generation of them. By grounding AIT expertise in proven, current-generation architectures, teams develop the foundation for full design capability without the cost of rebuilding from scratch what others have already validated. Organizations that have absorbed AIT at this level can set new parameters for mission needs, proposing concepts that their own validated expertise makes possible.



### A distributed model anchors capability at a decisive stage

The question then becomes how to structure this ownership. The solution is to take charge of the decisive stages locally while working with global partners that offer speed, maturity, and technological depth.

Local engineers working on regional mission profiles develop specific operational insights on mission-critical use-cases that a distant manufacturer lacks. When those insights are combined with an established technology stack and the development pace of a leading SAR provider, the result is a development-to-operations feedback loop that neither partner could sustain alone.

That is the model we are building. ICEYE contributes advanced SAR satellite manufacturing expertise from Finland. Space42 oversees integration, validation, and mission-readiness work in the UAE. Together, this creates a practical path to national expertise that is both credible and scalable.

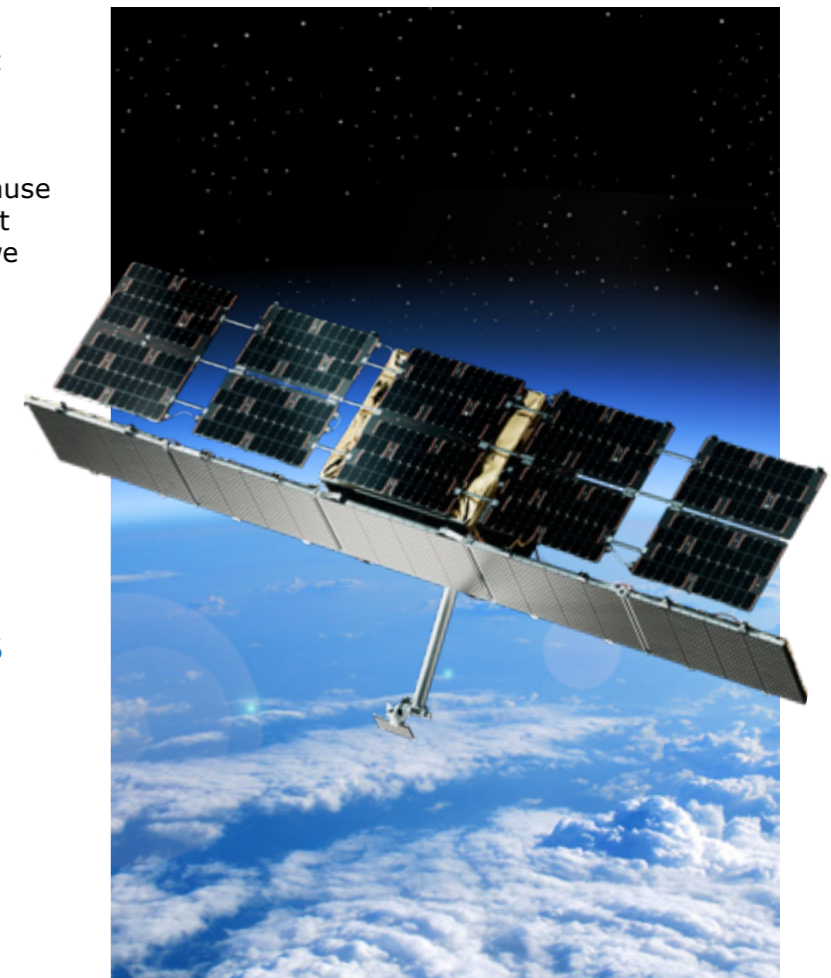
This is embedded in Space42's DNA: the belief that the best outcomes emerge when partners bring their distinct expertise without compromise. Finnish engineering precision, ICEYE's decades of SAR leadership, the UAE's sovereign technology and industrialization ambition, and our AI capability converge because each party contributes what it does best. That principle shapes how we build, not just who we build with.

**"In a field where precision and timing define outcomes, teams that master the testing process can move faster"**

### Extending that capability beyond a single program

SAR capability has historically been concentrated among a small number of nations and providers. Its value in all-weather, day-and-night imaging, from disaster response and infrastructure monitoring to maritime awareness, is becoming increasingly evident, driving investment from new countries. Differentiation will come from the ability to adapt programs and continuously improve them. Our role now is to deliver the integration expertise and operational readiness that turns a future partner's SAR investment into a functioning, mission-ready program.

Owning a satellite gives access to data. Mastering the satellite system through the verification and validation process means each mission advances our technical understanding. As SAR demand grows, the countries and enterprises that will lead are those that have built the knowledge to adapt and improve their programs, not just operate them. That is what drives our work, and what each Foresight mission advances. =

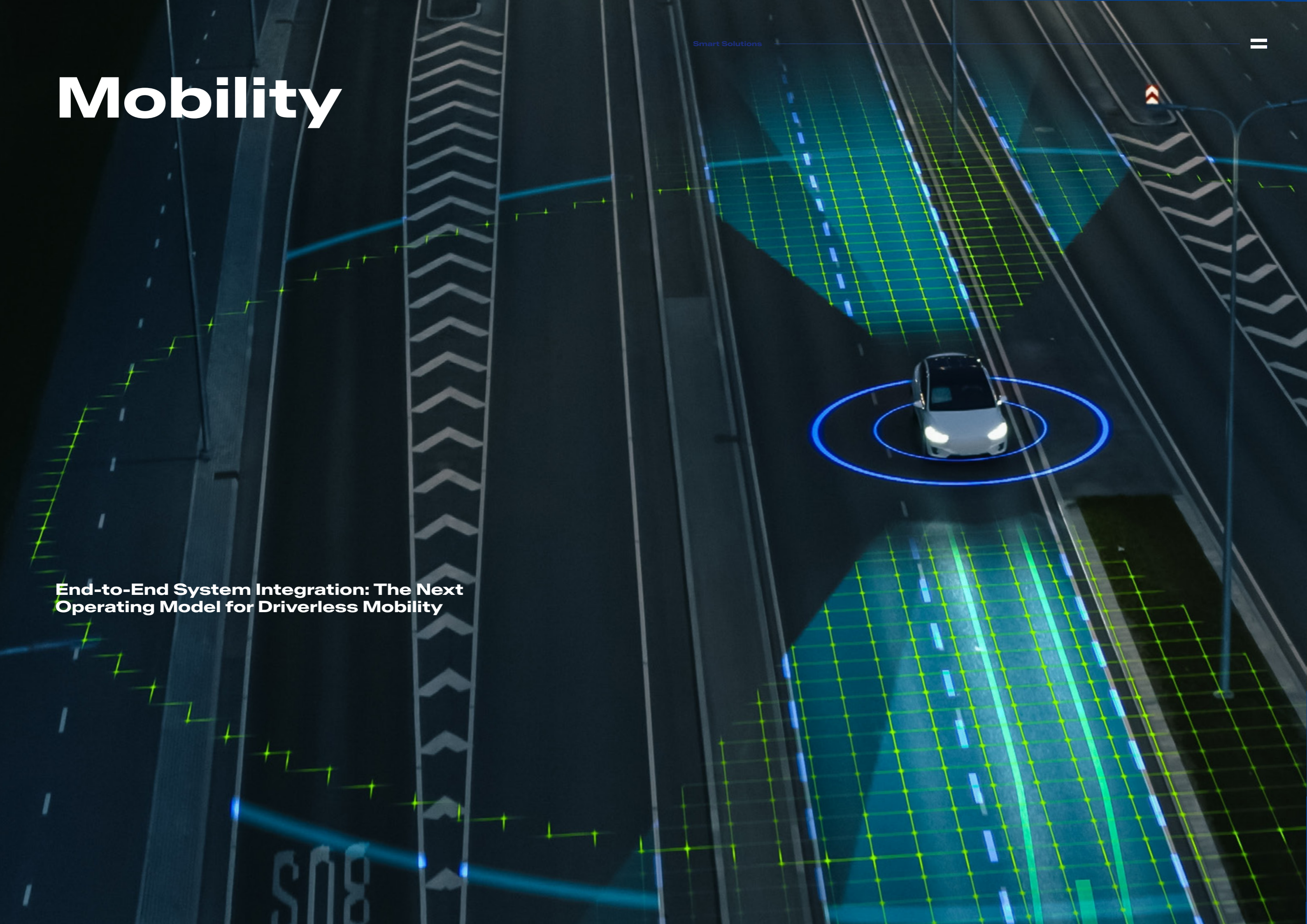


# Mobility

Smart Solutions



**End-to-End System Integration: The Next  
Operating Model for Driverless Mobility**



# End-to-End System Integration: The Next Operating Model for Driverless Mobility

## Muneera Al Marzooqi

Vice President, Smart Mobility, Smart Solutions



A decade ago, the central challenge in driverless mobility was technical: building vehicles capable of operating autonomously. That capability now exists.

The challenge today is deployment. By 2035, robotaxis will operate at scale in just 40 to 80 cities globally. The bottleneck is the fragmented ecosystem surrounding the vehicle. These include disconnected transport networks, legacy fleets, urban infrastructure that was never designed for autonomy, and regulatory environments still finding their footing.

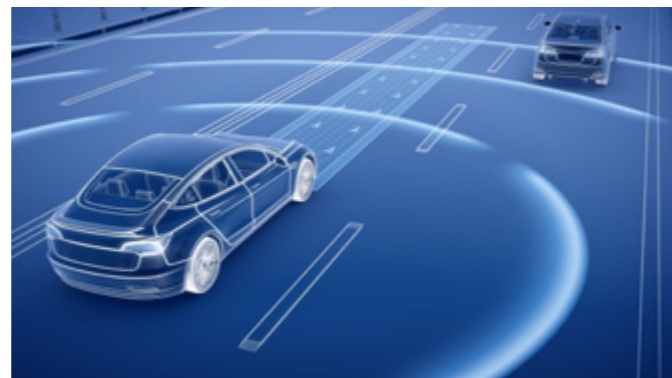
What we are seeing emerge is a different model for autonomy, one defined less by the vehicle itself and more by the system around it. The need for this change is clear to us, given estimates that adoption timelines have slipped one to two years on average. Historically platform development was the primary focus, when in reality solutions must equally prioritize deployment, coordination, and management within a functioning transport network.

### Scaling depends on the system around the vehicle

Closing the gap requires addressing hardware, software, and operational fragmentation across every stage of deployment. Cities that deploy AVs as standalone vehicles, without integration into fleet management, real-time traffic systems, and Vehicle-to-Everything (V2X) connectivity, consistently see adoption stall.

The Sovereign Mobility Cloud we developed alongside Microsoft and Core42, provides that foundation to the United Arab Emirates. In the case of industry first solutions such as this, inputs from the relevant regulatory authorities are a must, from conceptualization to development. The Cloud supports data sovereignty and local residency while giving cities the tools to coordinate HD mapping, fleet operations, telematics, and command center oversight in real time. Once live, it will continue to give regulators shared control, as we advance the platform and its capabilities.

This forward thinking and proactive approach towards governance requires regulatory maturity, with Abu Dhabi offering a strong example. In November 2025, the emirate became the first city in the Middle East and North Africa to launch full commercial Level 4 autonomous vehicle operations, supported by a regulatory framework that processes approvals in 45 days, compared to nine months or more in other regions. That speed we see here reflects a deliberate philosophy that includes testing rigorously, deploying progressively, and engaging global automotive, technology, and academic partners.



### ROii: Translating system design into experience

Technology and trust go hand-in-hand when we approach adoption. Passenger trust forms quickly, in some cases in under 90 seconds, and is shaped by how the system behaves under real-world conditions.

ROii, an autonomous shuttle developed through our partnership with Autonomous A2Z, is where the invisible infrastructure becomes tangible to the public. The seamless design, accurate navigation, and responsive operation are the outputs of fleet coordination and command center oversight running in the background. ROii also operates across a multi-vehicle platform spanning robotaxis, shuttles, and service vehicles, demonstrating efficiency, the consideration that comes with passenger-first engineering, and system reliability across varied real-world conditions. Within this format, we can build public confidence through consistent performance across routes, vehicle types, and environments.

“Autonomous mobility has crossed the technology threshold. What determines its future is execution”

### A retrofit model changes the adoption economics

Even a well-designed system will not scale if the economics do not support it. Replacing entire vehicle fleets is expensive and slow, proving difficult for governments and operators to justify when existing assets remain serviceable.

Our partnership with Autonomous A2Z addresses this constraint through a retrofit model: integrating the autonomous stack into existing vehicle platforms rather than replacing them. This platform-agnostic approach allows organizations to introduce autonomous capability while preserving current fleet investments.

The model applies equally across public transport, logistics, airport and campus mobility, and municipal services; anywhere operators need to scale capacity without replacing serviceable assets. When we look at South Korea, use cases include robotaxi operations and government fleet modernization programs. It also enables operators to scale transport capacity without a corresponding increase in manpower.

### Operational experience strengthens the model

Large-scale deployment is also a continuous learning process for us. Real-world environments introduce variables that no simulation fully replicates. These include shifting traffic patterns, mixed road users, and evolving passenger expectations. Systems that improve through live operation will sustain growth.

Global Market Insights projects the autonomous vehicle fleet operations market to expand nearly 24 times between 2024 and 2034. That growth depends on operators demonstrating that their systems can learn and improve through real deployment. Our TXAI robotaxi service has completed over 600,000 kilometers of autonomous driving and approximately 20,000 passenger trips without incident since 2021. This was also a significant reason we partnered with Autonomous A2Z, drawing from over a million kilometers of its fleets' self-driving experience, when designing for local deployments. Every kilometer adds operational experience that improves our system and builds regulatory confidence in our capabilities.

### The operating system for autonomous mobility

Autonomous mobility has crossed the technology threshold. What determines its future is execution.

At Space42, it is a key sectorial priority, one we are advancing by bringing together vehicle capability, digital infrastructure, and real-world operational experience into a single deployable framework, through our partnership with Autonomous A2Z, supported by the Sovereign Mobility Cloud.

As we look ahead, system integration will allow for autonomous solutions to be scaled sustainably, bringing us a step closer to the future of mobility. =



# Community and Culture

**Building a Space Workforce for the Age of AI**

**Where Curiosity Meets Orbit: Reimagining  
how the next generation interacts with space**

# Building a Space Workforce for the Age of AI

## Gretta Robles

Vice President, Talent Acquisition, Space42



Artificial intelligence is moving faster than the workforce needed to apply it in space. That is the reality of talent we see every day. At Space42, we are recruiting for roles that sit between satellite communications, geospatial analytics, software engineering, and AI. We need people who can shift focus between systems, data analysis, and operations in dynamic environments, rather than the conventional aerospace or software profiles that the market offers.

This gap remains because formal education is yet to catch up. Universities still tend to train these disciplines separately, despite the work itself becoming more integrated. We meet software engineers who rarely think about latency in satellite systems, and AI specialists who can build models but have not applied them to geospatial data in operational settings. These challenges are the norm in today's market.

This pressure is not unique to space technology. The World Economic Forum says 39% of workers' core skills are expected to change by 2030, and 85% of employers plan to prioritize upskilling their workforce. The OECD makes a similar point: AI is increasing demand both for specialist AI professionals and for teams that understand how to apply AI, which makes upskilling and reskilling programs essential.

### The hardest roles to fill are the ones that sit between disciplines

What does that mean in practice for a company like Space42?

It means the talent challenge extends beyond recruitment into workforce design. My experience in the field has shown me that the hardest roles to fill are often the ones that matter most to execution, because they span the boundaries between disciplines.

External hiring must be supported by capability development. The talent Space42 needs operates across disciplines: engineers who understand both orbital systems and software architecture; professionals who can move from satellite operations to data infrastructure without losing operational context; machine learning specialists who know that model accuracy is only one part of the job when the output must support decisions in a mission environment.



### Building talent where the market falls short

Our Management Trainee Accelerator exists to tackle this challenge, taking people with strong fundamental knowledge and training them to bridge gaps in capability. Aerospace graduates work more closely with geospatial data teams. Software developers spend time in satellite operations environments. This deliberate cross-training is designed to address hybrid roles.

The broad exposure prepares people for the actual jobs the business needs to fill, and we are not alone in this mindset. Bain & Company has found that nearly half of executives say a lack of in-house AI expertise is limiting implementation. That helps explain why more companies are shifting from hiring AI talent to building it. That shift also changes how we think about the pipeline before people even enter the workforce.

**“In the AI-enabled space business, workforce capability goes far beyond being a support function”**

### Nurturing talent begins earlier than recruitment

Our partnerships with universities follow this logic. We work with institutions such as MBZUAI because while academic strength still matters, on its own it is not enough. Students can arrive with deep theoretical expertise, yet be unprepared for the fast pace of work in an AI-enabled company. That is why hackathons, internships, and applied projects matter. These formats expose people earlier to the operational reality of hybrid roles and shorten the distance between classroom knowledge and live technical environments.



This effort extends further upstream. Programs such as Adopt-a-School have long-term benefits because talent pipelines in advanced sectors are cumulative. If you want more systems engineers, data specialists, and space operators in ten years, interest in these fields needs to be nurtured before students graduate.

### If we get this wrong, business impact is felt quickly

When I first started working closely with talent in this field, one thing became clear very quickly. Space companies often talk about technology as infrastructure, but they do not always view talent the same way. In the AI-enabled space business, workforce capability goes far beyond being a support function. It shapes how fast you can execute, how well you can integrate systems, and how much value you can extract from the technology you build.

Any company that struggles to advance and retain hybrid talent will face underused AI capabilities. From a space technology perspective, this could mean satellite systems will be harder to evolve after deployment. Teams will spend too long translating between functions that should already be understood by one another. Execution timelines will stretch. To overcome this we introduced AI@Work, closing the gap internally, embedding AI tools directly into how people work, and supporting a larger operational shift.

### Growing workforce capability ultimately grows the business

The space industry is moving faster than the talent pipeline that supports it. Companies that close that gap will scale more effectively. Those that wait for external factors or the labor market to solve the problem, will struggle to deliver the pace of innovation needed by the field. At Space42, we have learned that building the right workforce is part of building the business itself, to ensure ambition and execution remain aligned. =

# Where Curiosity Meets Orbit

Reimagining how the next generation interacts with space

## Fatima Alkaabi

Engineer,  
Advanced  
Technologies,  
Space Services



## Sarah Alharmi

Management  
Trainee, Earth  
Observation Space  
Missions, Smart  
Solutions



Globally, countries are investing in space, recognizing its role in communications, climate monitoring, navigation, and national resilience. The satellite and mission control centers that make these use cases possible, rely on the engineers that design complex systems, and the early inspiration that set them on this path. These engineers often trace their professional interest back to a childhood moment when space first felt within reach.

ASTROBITS, the first educational satellite-building kit of its kind, was created to spark that moment in more young minds.

Conceptualized and developed by multi-disciplinary talent at Space42, the project is led by cross-functional engineers, working alongside marketing and compliance teams. Supported by the UAE Ministry of Industry and Advanced Technology, ASTROBITS reflects the UAE's commitment to building advanced technical capability from an early age. It introduces satellite construction through immersive, hands-on learning, translating complex engineering principles into intuitive, engaging experiences. Instead of reading about space systems, children will be able to build them.



“ASTROBITS is the first educational satellite-building kit of its kind, created to spark that moment in more young minds”

### Simplifying space, unlocking imagination

At its core, ASTROBITS transforms sophisticated satellite architecture into accessible building blocks, combining hardware and software into a single educational journey. Students begin by unlocking each subsystem through interactive software challenges that explain purpose and function through visual storytelling and problem-solving.

Six modular square units represent the essential subsystems found in real satellites: power, communication, control, propulsion, onboard computing, and payload. Children can then attach 3D-printed components that demonstrate how each subsystem contributes to overall performance. As energy flows between modules and commands trigger responses, systems thinking becomes visible. By the time the satellite is complete, children understand how each piece connects to the whole. For many, this may be the first time abstract concepts become tangible.

### From idea to impact

ASTROBITS' vision resonates globally. Every nation advancing its space capabilities faces the same question: how early should we begin nurturing future engineers?

ASTROBITS offers one answer: start when curiosity is strongest.

Introducing satellite engineering fundamentals at an early age strengthens the long-term pipeline that turns curiosity into competence. It encourages problem-solving and creativity, skills that extend beyond aerospace into every advanced industry.



In the UAE, where space investment has accelerated over the past decade, ASTROBITS supports national priorities, including the UAE National Space Strategy 2030 and the UAE National Youth Agenda 2031, which focus on innovation, youth empowerment, and technological leadership. It is our belief that space exploration can be taken to new heights by youth that believe in themselves, their curiosity, and their capabilities. =



# Partner Content

**When the Map Moves: Real-Time Intelligence  
for a Faster World**

**The Future of Mission Critical Connectivity:  
From Reach to Operational Continuity at the  
Edge**



# When the Map Moves: Real-Time Intelligence for a Faster World

## Yvonne Chebib

Health & Public Sector Lead, Microsoft, UAE



When Space42 and the UAE Space Agency set out to build GIQ, the brief was to create a platform that has the ability to close a gap that organizations across the region had lived with for years: the space between what satellites can see and what decision-makers can actually do with this data.

GIQ was built through a deliberate public-private collaboration, grounded in the UAE's Space Strategy 2030, and designed from the outset to serve the ambitions of a country that has made space a pillar of its national future.

The underlying problem is structural. Geospatial data arrives from multiple sources in incompatible formats, requires significant compute to process, and has historically demanded specialist teams to interpret. By the time the analysis is ready, the window to act has often already closed. In sectors like oil and gas, urban planning, and emergency response, that delay is not only inefficient but also costly.

The UAE's Space Strategy 2030 is explicit about wanting the country's space capabilities to generate economic and social value on the ground.

GIQ is one of the clearest expressions of that intent. Its design assumes that geospatial intelligence should be accessible across government, enterprise, and the sectors where location data can change outcomes.

What GIQ does is make that intelligence operational, at speed and without requiring a specialist team to unlock it.

Built on Microsoft Azure, GIQ brings together multiple streams of Earth observation data into a single platform and uses AI to process, analyze, and surface insights in minutes rather than hours. The data pipeline that once required days of manual work now runs automatically. Azure provides the infrastructure and compute capacity to make that possible at a national scale.

No-code tools and guided workflows mean that the people closest to a decision and the analysts behind it can work directly with the intelligence. AI and machine learning handle both real-time and batch processing. Whether the need is urgent or scheduled, outputs are available when needed.

This architecture is also built for scale. A cloud-native foundation with microservices and container orchestration means GIQ can handle large, complex workloads without degrading performance on time-sensitive queries. And critically, it is designed to travel: what works at national scale in the UAE is deployable elsewhere, which is where the platform's global potential becomes real.

For government and regulated enterprise clients, data sovereignty is a non-negotiable requirement. All GIQ processing runs within UAE-based infrastructure, keeping sensitive data inside national borders and aligned with local compliance frameworks as and where required. Encryption, network controls, access management, and audit capabilities are built into the platform rather than added on.

The partnership behind GIQ is as important as the platform itself. Space42 brings geospatial intelligence depth and domain expertise built over years of working alongside the UAE Space Agency. Microsoft Azure contributes the infrastructure, security, and compute capacity that make operating at national scale possible.

The practical effect is that geospatial intelligence stops being a retrospective exercise. When a flood occurs, response teams can see affected areas and access routes within minutes. When a city expands, urban planners can model population shifts against infrastructure capacity before the concrete is poured. In health emergencies, location intelligence can identify where intervention is needed and where supply chains are breaking down. The data that was always there starts doing work it was never fast enough to do before.

What has been built for the UAE has the architecture and the ambition to reach further. The platform is designed to scale across geographies, and the model of a national space agency co-developing applied intelligence infrastructure with private sector and cloud partners is one other countries will look at closely. That is not a claim about what GIQ is today. It is an observation about where this kind of capability is heading.

Speed from data to decision is no longer a differentiator. It is the baseline expectation. Organizations that cannot meet it will not just fall behind. They will be making critical calls with yesterday's picture.



## COBHAM SATCOM

# The Future of Mission-Critical Connectivity: From Reach to Operational Continuity at the Edge



## Søren Egholm

SVP Product & Marketing, Cobham Satcom

Mission-critical operations are evolving. Assets are becoming more dispersed, operating environments more remote, and the tempo of decision-making continues to accelerate. Organizations across national security, border management, public safety, and critical infrastructure must maintain constant awareness and coordination - often far beyond the reach of terrestrial networks. Reliable, high-performance satellite connectivity has therefore become a central requirement for operational success.

In these environments, the need extends well beyond basic communication. Operators require consistent access to voice and data links that support command and control, situational updates, and coordination between mobile teams and central command. The challenge is to ensure that these links remain available and stable under all conditions, whether on land, at sea, or in the air.

### Dependable connectivity is mission-critical in a hyper connected world

Space42's resilient satellite network and Cobham Satcom's advanced terminal and edge solutions play a critical role to make connectivity dependable. Together, they create a framework

that enables continuous communication and control in areas where traditional networks cannot reach. Space42 provides the global satellite infrastructure that ensures coverage and capacity for demanding high-security operations. Cobham Satcom delivers the hardware and edge performance that bring that connectivity directly to the field - through rugged, reliable NEO series of terminals designed for real-world conditions.

The market need driving this approach is clear. Border and perimeter operations, for example, depend on the ability to link patrol units, sensors, and command centers across vast areas with limited infrastructure. Reliable satellite connectivity ensures that situational information, alerts, and voice communication reach the right people at the right time - supporting faster, more coordinated responses.

Critical infrastructure operators face similar challenges. Utilities and energy providers must monitor and control assets spread across large, often inaccessible regions. Satellite-enabled communication ensures that remote systems remain visible and controllable, even when terrestrial networks are unavailable. This is essential for maintaining safety, preventing outages, and reducing downtime.

## Integration at the edge

A growing requirement across these sectors is the ability to integrate different communication networks into a single operational environment. Cobham Satcom's PRISM PTT+ exemplifies this capability by combining satellite, LTE, and LMR voice services into one seamless push-to-talk platform. This integration allows operators to maintain clear, uninterrupted communication as teams move between network types - ensuring that voice coordination remains consistent from central command to the edge of operations.

The next generation of mission-critical connectivity will be defined by reach and operational continuity, including the ability to sustain communication and coordination under any circumstances. The combination of Space42's satellite network and Cobham Satcom's terminal technology meets this growing market need, providing clarity, reliability, and control where it matters most: at the edge of operations.

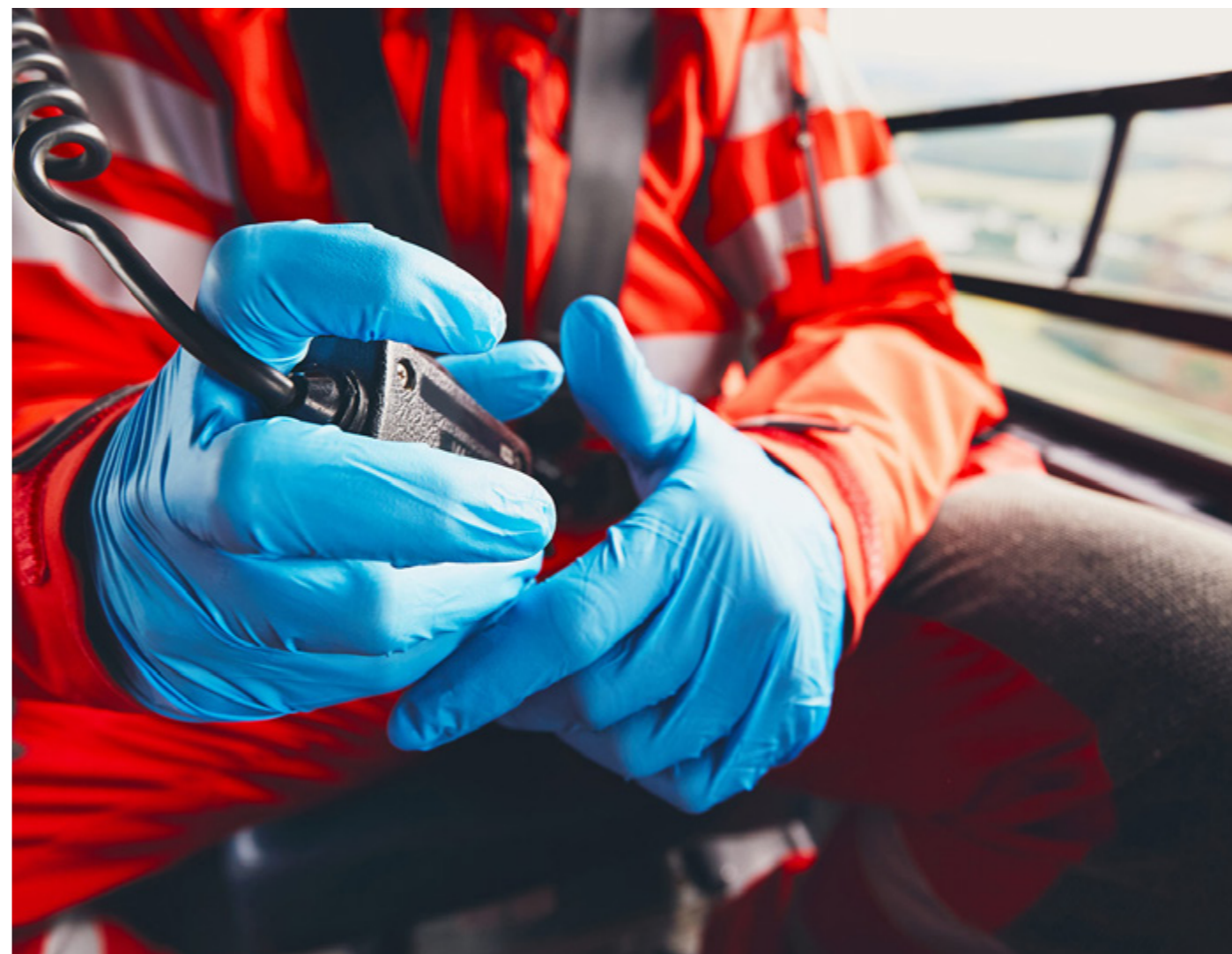
## Key Technologies

### NEO Terminal Series

Cobham Satcom's purpose-built satellite terminals developed for Space42's network, engineered for resilient connectivity at the operational edge.

### PRISM PTT+

A push-to-talk platform that unifies voice communications across different networks and devices into a single environment, enabling operators to create call groups, bridge legacy and next-generation systems, and maintain coordinated contact across the full operational picture.



# Awards and Achievements



Outstanding Partner – Artificial Intelligence Solution  
**April 2026 | Autonomous Mobility**



Aeronautical Mobility Innovation  
**March 2026 | HAPS**



SpaceNews Icon Award  
**2025 | Equatys**



Top 100 CEOs  
**November 2025 | Ali Al Hashemi**



Top 100 CEOs  
**November 2025 | Hasan Al Hosani**



Smart City Transportation Award  
**September 2025 | TXAI**



AI Satellite Award  
**September 2025 | Thuraya-4**



150 Most Influential Arabs – Disruptors  
**September 2025 | Karim Sabbagh**



Brands That Matter in Logistics and Mobility  
**July 2025 | Space42**



Best Connectivity Solutions  
**May 2025 | Space42**



Company to Watch  
**March 2025 | Space42**



Most Innovative Company in Logistics and Mobility  
**December 2024 | Space42**



Satellite Solutions Provider of the Year  
**November 2024 | Space42**



Strategic Transaction of the Year  
**September 2024 | Space42**



# THE ORBIT

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