

THE ORBIT

VOL. 1

**BEYOND EARTH:
INTELLIGENCE,
CONNECTIVITY,
AND THE NEW
SPACE FRONTIER**



Karim Sabbagh

Managing Director, Space42



From integration to impact: The new era of space

The space industry has long operated through specialization. For decades, satellite communications and geospatial intelligence developed along separate tracks, serving distinct markets with specialized capabilities. That separation may not be relevant going forward. Today, governments and enterprises need integrated solutions that deliver actionable intelligence and communications platforms they can use to make better decisions, faster.

One year ago, we launched Space42 to address this shift, bringing together satellite communications, geospatial analytics, and AI into a unified platform. This first edition of "The Orbit" captures where we are in that journey: what we have built, what we have learned, and where the industry is headed.

Our foundation is strong. Space42 builds on a decades long legacy of operational excellence in satellite communications and AI-powered geospatial analytics, combining proven infrastructure with advanced technical capabilities. Our work aligns with the UAE's vision to build sovereign capabilities in space and AI, positioning the nation as a hub for advanced technology. This heritage gives us the scale and depth to compete on the global stage while serving critical missions closer to home.

The timing matters. The global space economy is projected to reach \$1 trillion by 2040, driven largely by demand for resilient communications and geospatial intelligence. Urban planners build smarter, more resilient and sustainable cities. Energy companies apply geospatial data and AI analytics to optimize remote operations. Governments secure borders and manage emergencies through our communications platforms. Telecommunications providers extend connectivity to underserved regions through non-terrestrial networks. Our role is to make these capabilities accessible, trusted, and applied where they create the most value.

Whether you are shaping government policy, managing enterprise operations, or developing technical solutions, this magazine offers practical insights into how space technology is reshaping your sector. Our leaders, engineers, and product teams share their perspectives on the platforms and applications shaping our world. I hope this first edition offers you valuable perspectives on where the industry is heading and what becomes possible when capabilities move beyond isolated systems to integrated platforms.

Thank you for joining us on this journey.



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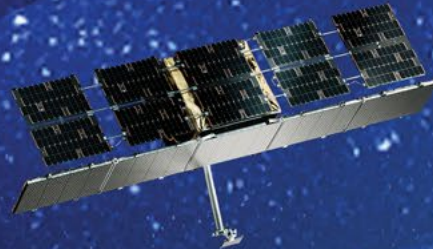
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Multi-Orbit Architecture: A Connected System from Space to Earth

Low Earth Orbit (LEO)
(160-2,000km above Earth)

**Foresight Synthetic Aperture Radar (SAR)
Constellation Satellites**



Geostationary Orbit (GEO)
(36,000km above Earth)
Thuraya and Al Yah Satellites



Stratosphere
(10-50km above Earth)
**Mira Aerospace High-Altitude
Platform Systems (HAPS)**



Space Services

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Why shared space infrastructure is the stronger path to universal connectivity

Ali Al Hashmi

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



Universal connectivity has become as fundamental as electricity, water, or transportation networks. Yet, according to the International Telecommunication Union, nearly 2.6 billion people, approximately one-third of the world, remain offline. More than 320 million people still live in areas without any mobile broadband coverage. This gap limits economic participation and perpetuates global inequality.

Twenty years in this industry has taught me that connectivity gaps represent strategic vulnerabilities that extend far beyond individual inconvenience. When natural disasters strike, we watch entire communities disappear from

the digital world overnight. Cellular towers submerge, fiber cables sever, and suddenly millions of people lose their lifeline to emergency services, family members, and the outside world. Yet above them, satellites continue orbiting, carrying signals across the globe but unable to reach the smartphones in their pockets.

These failures reveal a deeper problem: the fundamental limitations of how we build connectivity infrastructure today. I have always believed connectivity is a human right. Without it, entire populations remain excluded from education, healthcare, commerce, and governance. In an increasingly digital world, geography continues to determine opportunity.



Connectivity is a human right. Together, we can make it a universal reality.

The infrastructure models we have relied on for decades now face clear limits. Towers and fiber cannot economically reach remote or sparsely populated regions. Natural disasters interrupt terrestrial networks precisely when connectivity matters most. Meanwhile, many traditional satellite solutions remain closed and exclusive, built around proprietary architectures that limit participation and fragment the path forward.

A new model for space infrastructure

This is why Space42, together with Viasat, announced Equatys, a joint initiative that introduces the industry's first space tower-like company model. Equatys operates as a shared and neutral Non-Terrestrial Network infrastructure platform, backed by more than 100 megahertz of harmonized L- and S-band spectrum across over 160 countries. This represents the largest coordinated spectrum portfolio in the history of our industry.

The name itself reflects our mission. Equatys draws inspiration from four principles: equity, equality, equilibrium, and experience. These values inform every decision we make.

The system comprises a Low Earth Orbit constellation integrated with geostationary systems. The 5G open architecture platform aligns with 3GPP Release 17+ standards and is built with spectrum and orbital efficiency at its core, reducing launches, minimizing congestion, and enhancing space sustainability. Our goal is to build frictionless convergence between ground and space systems, uniting the digital landscape. Commercial operations are expected to begin within three years.

Why shared infrastructure matters

Equatys will operate as a lean infrastructure provider using a shared multi-tenant model.

This approach reduces redundant investments while delivering cost-efficient capacity to ecosystem participants. The venture creates a win-win playing field for all stakeholders rather than a winner-takes-all alternative.

The telecommunications industry has already proven this model works. Tower sharing enabled mobile operators to reduce costs and expand reach while maintaining healthy competition. Equatys applies the same logic to space, lowering unit cost, removing entry barriers, and accelerating growth across the industry.



By pooling infrastructure and spectrum across multiple orbits, participants benefit from scale advantages while reducing individual investment risk. The platform serves mobile network and satellite operators, device manufacturers, and regulators within an open and neutral framework.

Designed for inclusion and sovereignty

Equatys delivers seamless connectivity using standard smartphones and IoT devices, requiring zero modification or specialized hardware. It enables persistent coverage across land, sea, and air. This infrastructure is designed for inclusion. It enables operators to grow profitably and extend their networks beyond physical towers. It allows governments to maintain full sovereignty

over infrastructure, data, and deployment. It allows spectrum holders to reach underserved markets and local space industries to participate in technology development and manufacturing. And it creates commercial and strategic value across both public and private sectors.

Critically, the platform is designed for both independence and collaboration. Equatys aligns with existing regulatory frameworks and ITU principles, working collaboratively within global norms rather than seeking exceptions or special treatment.

This connectivity transforms individual use cases into systemic change.

Closing the digital divide permanently

Equatys intends to serve the unconnected and the uncovered. It is designed to ensure that geography becomes irrelevant to access. From enabling disaster resilience and national security to unlocking new agriculture, healthcare, and education services, this platform exists to close the digital divide permanently.

We envision a world where the only obstacle to connectivity is owning a device. Within a decade, coverage gaps will seem as outdated as wired internet. The satellites orbiting above will connect with the smartphones in our pockets, the sensors in our fields, and the systems that drive our economies.

This is the future we are building. A future of mobility everywhere. A future where infrastructure is shared, access is equitable, and growth is inclusive.

The technology exists. The spectrum is coordinated. The framework is ready. What we need now is collective commitment from governments, regulators, and industry leaders to embrace shared infrastructure as the path forward.

Connectivity is a human right. Together, we can make it a universal reality.



Engineering a platform for what comes next: The technical architecture behind Thuraya-4

Adnan Al Muhairi

CTO of Space Services, Space42



Building a geostationary satellite typically means defining services first, then engineering hardware to deliver them. We reversed that sequence. Thuraya-4 had to support 16 products we hadn't yet designed. That single requirement drove every technical decision, from spacecraft bus selection to onboard processing architecture.

The solution required rethinking how we architect satellites. Instead of fixed hardware configurations, we needed flexibility. Instead of purpose-built systems, we needed adaptability. The answer was software-defined architecture taken further than we'd attempted before.

The software-defined solution

We chose Airbus Defense and Space's Eurostar Neo as our foundation. The all-electric architecture provides power efficiency and extended operational life, but the critical decision was committing to a fully software-defined payload. Signals route through virtualized network functions running on onboard processors. The satellite reconfigures coverage,

allocates power, and optimizes modulation schemes through software updates rather than physical modification modifications.

This architecture delivers three core capabilities. The 12-meter antenna system, the largest L-Band feed system Airbus Defense and Space has deployed to date, works with onboard processing to steer beams dynamically based on real-time demand patterns. Adaptive modulation automatically adjusts transmission parameters to maintain quality of service across varying atmospheric and geographic conditions. Carrier aggregation across 3,200 channels enables dynamic power allocation, distributing capacity based on traffic patterns rather than static frequency plans.

The tradeoff is system complexity. Software-defined architecture requires sophisticated ground control systems and careful orchestration of virtualized functions. We accepted that complexity because it allows the satellite to evolve with emerging standards and customer requirements throughout its operational lifetime.

Thuraya-4 integrates with virtualized network functions that enable seamless handoffs between satellite and terrestrial networks.

Integration architecture

The value of a software-defined satellite depends on how it connects with terrestrial systems, cloud infrastructure, and edge computing environments.

Thuraya-4 integrates with virtualized network functions that enable seamless handoffs between satellite and terrestrial networks. The onboard processing capabilities support edge computing by moving computational tasks closer to data sources, reducing latency for time-sensitive applications. We designed native compatibility with emerging 3GPP non-terrestrial network standards. As those standards mature, the satellite's architecture allows us to implement new protocols through updates rather than hardware replacements.

This approach directly enables Space42's broader Non-Terrestrial Network strategy, including Equatys, our Direct-to-Device satellite network in partnership with Viasat.



Performance metrics

Thuraya-4 transitioned from launch to operational status in eight months. The system now delivers:

L-Band speeds exceeding 1 Mbps

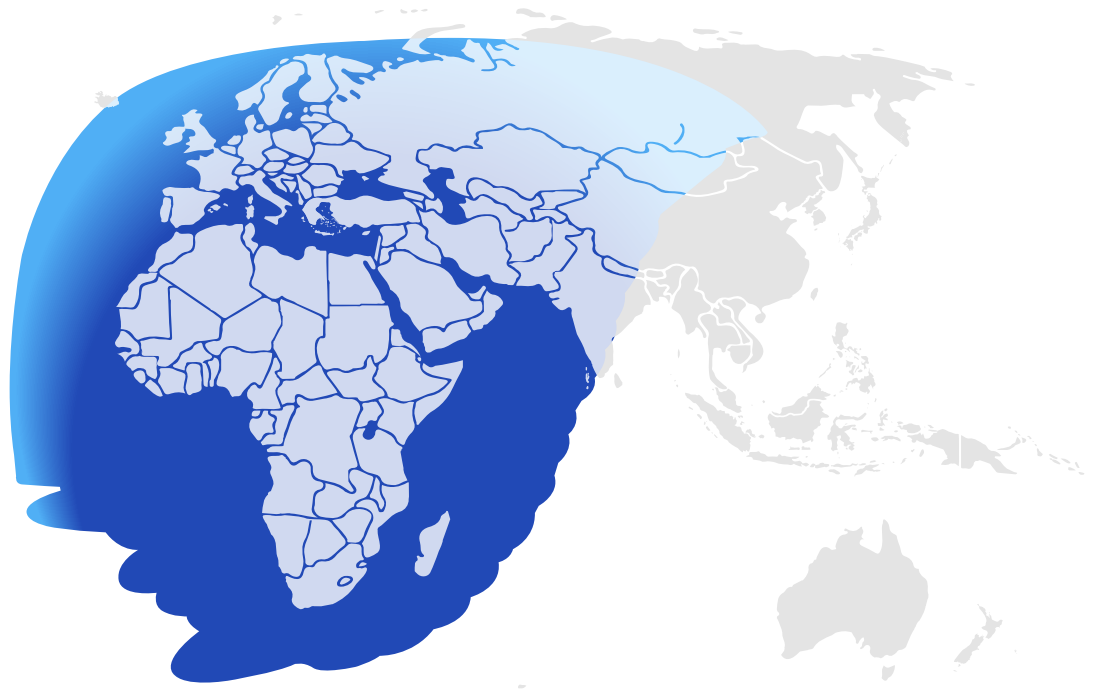
consistently across coverage spanning Europe, Africa, Central Asia, and the Middle East. Advanced signal processing achieves these data rates while maintaining service quality under varying conditions.

All 3,200 channels are operational with dynamic power allocation optimizing capacity distribution based on real-time demand. The satellite demonstrates the ability to shift resources where they deliver the most value.

Zero critical anomalies occurred during commissioning. Seamless integration with the existing Thuraya constellation maintained service continuity throughout the transition, with minimal customer impact during handover.

These results confirm the engineering approach: software-defined architecture delivers both flexibility and reliability at geostationary scale.

Thuraya-4 Coverage Map



The platform in practice

The first commercial products running on Thuraya-4 connect emergency responders in crisis zones, maritime operations across oceans, and IoT devices in remote locations. The infrastructure now supports these initial services while creating the foundation for the remaining products from our original 16 through shared resources.

This is the economic shift that matters. Instead of designing and deploying separate satellites for different missions, we engineer shared infrastructure that enables multiple applications. Deploy new services through software rather than launching new hardware,

and the economics and timelines change fundamentally.

The technical foundation supports both current operations and future capabilities we're still defining. As space infrastructure becomes increasingly interconnected, Thuraya-4 demonstrates how platform-based architecture scales, how integration models enable convergence of space-based and terrestrial networks, and how software-defined systems adapt to requirements that emerge after launch.

Thuraya-4 is operational, delivering the services we planned for and creating possibilities we're still discovering.

The solution required rethinking how we architect satellites. The answer was software-defined architecture taken further than we'd attempted before.

THURAYA-4 CONNECTING WHAT MATTERS

SPACE-BASED. EARTH-FOCUSED.





Beyond borders: Space42's new model of sovereignty

Khalid Al Naqbi

VP of Product and Engineering, Space42



Twenty-five years ago, the first call made through Thuraya-1 declared sovereign capability for the region. That moment crystallized my belief in the power of sovereign space-based communications. Twenty-five years later, as Thuraya-4, Space42's next-generation L-band mobile satellite launched in January 2025, enters commercial operations, that same conviction drives Space42's mission to lead the next evolution of global connectivity.

Thuraya-4 symbolizes the convergence of technology, sovereignty, and opportunity. The satellite unlocks 16 new solutions serving dual-use domains across defense and commercial markets. Built over years of design, investment, and innovation, it continues a proud legacy while bridging a new era as the cornerstone of Space42's transformation strategy.

The emergence of new space

As we mark 25 years since Thuraya-1's launch, we stand at the threshold of New Space: a shift from state-dominated space programs toward a dynamic, commercialized ecosystem driven by private innovation, miniaturization, and digital convergence. Global investment in the New Space economy exceeded \$270 billion in 2024, according to Euroconsult, with more than 10,000 satellites expected to be operational in low and geostationary orbits by 2030. The cost of launching a satellite has dropped by over 80 percent since the early 2000s, enabling smaller nations and private entities to join the space economy for the first time.

Space42 embodies this shift while anchoring it in sovereign purpose. Our objective is to build autonomy through infrastructure that adapts to evolving threats and opportunities. The Al Yah 4 and Al Yah 5 program, backed by an AED 18.7 billion (USD 5.1 billion) contract with the UAE government, will deliver sovereign communications and defense-grade resilience for the next two decades. These geostationary satellites, launching from 2026 onward, feature software-defined payloads that enable real-time reconfiguration of coverage, spectrum, and bandwidth. This capability guarantees operational autonomy in contested or disrupted environments.



The direct-to-device revolution

While Al Yah satellites secure sovereign communications infrastructure, Equatys democratizes access. Our project with Viasat enables any smartphone or IoT device to reach satellites directly through open architectures and shared standards. This transforms how the world accesses orbital resources.

The applications are immediate. Disaster response teams remain operational when terrestrial networks fail. Defense units maintain secure communications in remote terrain. Researchers stay connected from isolated frontiers. This model proves that global collaboration can strengthen, rather than compromise, sovereignty.

The market validates this approach. According to the Satellite Industry Association, global satellite data revenue will exceed \$50 billion annually by 2030, driven largely by direct-to-device and IoT applications. Space42's leadership in this domain positions the UAE and its partners as architects of the next orbital economy.

Intelligent convergence

This democratization of access gains power through integration. Space42's strength lies in uniting multiple domains that others treat as distinct. Our Earth observation systems, equipped with Synthetic Aperture Radar (SAR) and powered by AI-driven analytics, operate in tandem with our communication satellites. Through our Foresight constellation and GIQ analytics platform, we process imagery into actionable intelligence within minutes, while communication channels relay insights securely across theaters of operation. This fusion of

observation and communication multiplies the strategic value of every satellite.

A study by the World Economic Forum predicts that by 2032, over 60 percent of all satellite constellations will be hybrid in nature, combining imaging, IoT, and connectivity functions. Space42 is already realizing this future. Each asset serves multiple roles, enhancing defense operations, commercial connectivity, and environmental monitoring simultaneously. This model strengthens resilience and delivers exponential returns on investment for both shareholders and the state.

Beyond borders

Countries that establish leadership in space communications today will define the digital frontiers of tomorrow. The UAE's transformation from a regional telecom hub to a global space technology leader demonstrates what strategic foresight can achieve. Space42's journey reflects that national ambition: from Thuraya-1's historic first call to an integrated, multi-orbit platform that unites communications and Earth observation capabilities across defense and commercial markets, powered by AI-driven analytics.

Twenty-five years after that first call, each generation of Thuraya satellites has expanded our reach, but Thuraya-4 marks a shift in philosophy. It demonstrates that sovereignty and innovation can coexist, that collaboration can strengthen independence, and that the future of space belongs to those who see beyond borders. The emergence of New Space represents the natural extension of our founding mission: to enlighten the world from space.



Using satellite connectivity to solve healthcare's last-mile problem

Martin Kaufmann

Director, Product Development and Pre-Sales, Space42



In rural Nigeria, a mother in labor faces life-threatening complications. The nearest hospital is hours away. The local midwife activates a Thuraya-connected Telemedicine kit, transmitting vital signs to an obstetrician. Within minutes, lifesaving medicine is dispatched and a treatment plan relayed back. What once demanded a costly, improbable evacuation is resolved on-site, saving both mother and child.

This scenario is now reality because of three integrated capabilities working together: satellite connectivity that reaches anywhere, AI that prioritizes clinical data in bandwidth-constrained environments, and adaptive systems that maintain care quality even on weak connections. Together, they compress emergency response from days to minutes, bridging the digital divide for millions beyond the reach of terrestrial infrastructure. For Space42, this is a strategic priority in building Non-Terrestrial Networks that deliver tangible improvements in human wellbeing.

The last-mile gap nobody can ignore

Rural communities endure healthcare deserts. A third of humanity remains offline, cut off from digital services others take for granted.

The connectivity infrastructure gap compounds the problem. Towers fail during storms, and care stalls when networks go dark. Meanwhile, extending terrestrial infrastructure to sparsely populated areas remains commercially difficult. Yet, the opportunity is vast: the global telemedicine market is expected to reach \$334 billion by 2032. Closing this gap is as much about economics as it is about equity.

Solving this requires rethinking how connectivity works in constrained environments. Traditional approaches optimize for either bandwidth or coverage, but remote healthcare demands both simultaneously. The solution integrates three capabilities that individually exist but have never been combined at this scale.



Three capabilities working as one system

Thuraya has designed a model where hybrid connectivity, AI-driven intelligence, and adaptive bandwidth management work together to create an “always on” healthcare experience.

Hybrid connectivity: seamless network handoffs

The first capability blends terrestrial networks, Mobile Satellite Services (MSS) for mobility and reach, and Fixed Satellite Services (FSS) for bandwidth-heavy needs such as medical imaging and records. Automatic handovers keep care continuous, switching between network types based on availability and quality without dropping connections.

This approach proved critical in Europe, where overturned trucks trigger automatic alerts that are instantly relayed to first responders through Thuraya’s network, allowing immediate response coordination. The system maintains the connection as emergency teams move between cellular coverage zones and satellite-only areas.

AI-driven prioritization: getting the right data first

The second capability uses on-device AI models to prioritize vital signs and images, enabling pre-triage and pre-screening while cutting unnecessary retransmissions. Clinicians see the most urgent data first, even when bandwidth is severely constrained.

Space42 has made AI integration central to how we approach satellite connectivity. Rather than transmitting everything and hoping it arrives in useful order, the system analyzes clinical data at the edge, determines what matters most for immediate decision-making, and ensures that information reaches physicians before less critical details. The result: faster diagnoses and treatment decisions in situations where seconds matter.

Adaptive bandwidth management: maintaining quality on weak links

The third capability tailors bandwidth usage for clinical workflows. Systems are designed to function even on weak connections: medical images are compressed but remain diagnostically reliable, augmented reality guidance continues despite intermittent connectivity, and data

sensors save information locally and upload it once connectivity improves.

At sea, fishermen rescued during violent storms use Thuraya phones to connect with emergency teams and reassure their families. The system maintains voice quality for critical communications while queuing less urgent data transfers for when conditions improve. When typhoons hit villages in the Philippines, government disaster response teams carried satellite units into affected areas within hours, restoring communications and assessing medical needs when terrestrial networks had failed.

Together, these three capabilities achieve what no single technology could accomplish alone. With Thuraya’s hybrid connectivity backbone and partner ecosystem, “anywhere medicine” is moving from pilot projects to standard practice.

Why this model scales

The power of this approach lies in three factors: technological convergence, economic viability, and ecosystem breadth.

Thuraya’s multi-orbit backbone integrates MSS and FSS for resilience, while portable medical devices such as the Telemedicine Kit provide ground telemetry. The 12-meter antenna system aboard Thuraya-4, combined with onboard processing, enables dynamic beam steering that adapts coverage in real-time based on demand patterns. AI accelerates decision-making, ensuring clinicians receive the right information at the right moment.

Scalability is enhanced by Thuraya’s global network of over 150 partners, which extends telemedicine and eLearning services to the world’s most remote regions. The breadth of this ecosystem enables rapid deployments in moments of crisis, whether restoring communications after natural disasters or establishing medical consultation capabilities in areas that have never had reliable connectivity.

The global telemedicine market is expected to reach \$334Bn by 2032. Closing this gap is as much about economics as it is about equity.



THURAYA MBH

**CONNECTIVITY
ON THE MOVE**



What this means for healthcare delivery

This shift from theoretical to operational changes what's possible in healthcare infrastructure. Systems designed for resilience require pre-positioned satellite capabilities in disaster-prone areas, so care continues when terrestrial networks collapse. Medical personnel need training for satellite-enabled care, and healthcare systems should create career tracks that recognize this specialty. Frameworks must be developed that safeguard patient privacy across borders and regulate AI-enabled diagnostics in ways that enable innovation while protecting patients.

The technical foundation is proven. The economic model works. The partnerships are operational.

Rewriting the rules

For centuries, geography determined who received life-saving healthcare. Today, Thuraya's satellite-enabled telemedicine is rewriting those rules. Whether in a village, a fishing boat at sea, or a storm-struck town, patients have access to life-saving healthcare as those in global capitals.

This work advances Space42's mission to lead in Non-Terrestrial Networks and deliver tangible improvements in human wellbeing. Anywhere medicine is here, turning "not connected" into "always cared for", evidence that space technology is reshaping the future of healthcare on Earth.



Smart Solutions

The background of the slide is a dark blue field filled with dynamic, flowing lines in shades of blue and white. These lines create a sense of movement and energy, resembling a stylized representation of data flow or a celestial body's magnetic field. In the center-left area, there is a glowing sphere with a bright yellow-white core and a red-orange outer ring, giving it the appearance of a distant planet or a sun.

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Sovereignty: The premium currency of the space economy

Hasan Al Hosani

CEO of Smart Solutions, Space42



Dependence and vulnerability

The global space economy reached \$613 billion last year and is growing at 7% annually. Yet most nations remain reliant on foreign satellites and platforms for the data, communications, and analysis which drive this economy, a reliance that exposes them to geopolitical risk and slows their ability to respond in times of crisis.

Sovereignty in this industry matters because it touches lives every day. Farmers need trusted data to protect harvests, city planners require accurate maps to ease traffic, and first responders rely on real-time imagery to save lives. When these essential services are tied to foreign, external systems, governments lose freedom of action and citizens face unnecessary risks.

At Smart Solutions, Space42's mapping, geospatial intelligence and AI division, we have built our strategy around two core pillars: becoming the preferred partner for premium geospatial data, and establishing global leadership in geospatial intelligence AI platforms and services. These pillars form the foundation that makes sovereignty possible.

The solution: building sovereign ecosystems

Sovereignty is the solution to dependence. It ensures nations can act autonomously, protect their citizens, and secure long-term prosperity. Delivering sovereignty requires an integrated ecosystem built on four interlocking pillars:

Mapping: the foundation of national decision-making

Every decision begins with a clear picture of the ground. Without accurate mapping, autonomous vehicles cannot operate, researchers cannot track water, and emergency services cannot reach those in need.

As the preferred partner for premium geospatial data, Space42 delivers the mapping foundation that sovereign nations require. Our decades of expertise, from aerial surveys to imagery from Optical and Synthetic Aperture Radar (SAR) satellites, provide the comprehensive territorial oversight and ensure governments start with a solid foundation. Initiatives like Map Africa, where we aim to extend this mapping foundation to 1.5 billion people across the continent, will replicate the base maps that supported many nations' development and transformation.

Observation: owning the vantage point

If maps are the foundation, Earth Observation is the vantage point. A sovereign stream of trusted, real-time intelligence gives governments the ability to act at speed. When storms threaten coastal villages or illegal activities unfold at sea, constellations like Foresight, Space42's SAR constellation, ensure immediate visibility. Owning the vantage point turns intelligence into independence.

AI: turning data into sovereign intelligence

This is where Space42's leadership in geospatial intelligence AI platforms becomes critical. Data alone does not deliver sovereignty; intelligence

does. With sovereign AI platforms like Space42's GIQ, nations transform imagery into insights that protect borders, manage cities, and improve daily life.

This is already happening. We are developing solutions for disaster responses in GIQ and providing valuable information during dust storms and floods. In 2023, we supported efforts on the ground in response to the Turkey earthquake. These cases illustrate how sovereign intelligence serves as a shield for national security and a bridge to global collaboration and opportunity.

Resilience: building strength at home

Sovereignty also means resilience: the ability to design, build, and sustain systems domestically. When satellites, High Altitude Platform Systems (HAPS), and AI are developed locally or with trusted allies, value stays in the country. Engineers, researchers, and graduates gain the skills to innovate. Instead of sending investment abroad, nations create industries, jobs, and long-term prosperity.

Tailored payloads ensure platforms meet national priorities, delivering secure communications and observation. Offering sovereign assets as a service, Space42 transforms capability into action, ensuring continuity in crises and turning national strength into global opportunity.

Sovereignty in action

The true test of sovereign ecosystems is in times of crisis. Floods, wildfires, and earthquakes require immediate responses, and governments with sovereign assets can act decisively.

Rapid deployment of local systems ensures the continuity of critical services and strengthens public trust when it matters most.

Sovereignty also enhances competitiveness. By owning critical platforms, nations capture more value at home and create industries that drive innovation. Domestic capabilities generate high-skilled jobs and attract investment, while also enabling governments to export advanced capabilities abroad, transforming sovereignty into an engine that drives long-term economic growth and global influence.

Ultimately, sovereignty ensures true independence in national strategy. When governments control their own platforms, they can make decisions on security, economics, or climate action, free from foreign constraints. This independence ensures continuity through uncertainty and confidence in long-term planning.

The vision: a global imperative

What began as a national investment is now becoming a global opportunity. By transforming sovereign platforms into exportable solutions, the UAE is directly empowering nations to achieve independence. Domestic investments are now catalysts for regional resilience and global prosperity.

The future of the space economy will belong to nations that own their platforms, protect their citizens, and create industries at home while contributing and collaborating abroad. Space42 is building the infrastructure that makes this sovereignty real.



Protecting people and the planet with AI

Dr. Prashanth Marpu

CTO of Smart Solutions, Space42



From the food we eat to the air we breathe, the stability of our daily lives depends on the delicate balance of our natural and built environments. Protecting this balance requires new ways to observe and anticipate change, an area where AI and satellite technology play a transformative role. Advances in these tools provide continuous monitoring that supports early warning systems and mitigation efforts, enabling communities to address challenges proactively and adopt more sustainable ways of living and working.

This capability becomes increasingly vital as our world grows more interconnected. According to the Global Assessment Report (GAR) 2025, from the United Nations Office for Disaster Risk Reduction's, global disaster-related losses now exceed \$2.3 trillion annually when accounting for direct damage to physical assets, disruption of economic activity, and degradation of natural ecosystems. Beyond monetary losses, the human toll is staggering. In 2024 alone, natural hazard-related disasters affected more than 167.2 million people worldwide. This includes both immediate impacts and cascading, indirect effects that strain households, businesses, governments, and natural systems, thereby amplifying the overall economic and social burden.

This scale reflects both the increasing frequency of extreme events and the growing vulnerability of interconnected systems. The opportunity extends beyond immediate response to encompass a fundamental question: how can societies develop resilience by using advanced technologies that enable proactive stewardship of our shared environment?

The technical challenge centers on transforming vast quantities of Earth observation data into actionable intelligence within operationally relevant timeframes. Decision-makers across government, industry, and humanitarian sectors require analytical tools that process complex, multi-source information and deliver insights for strategic planning and operational excellence. This requirement drives Space42's research and development into AI-powered geospatial analytics as a foundation for planetary monitoring and early warning systems that serve both environmental protection and human prosperity.



167 million

people worldwide are
affected by natural
hazard-related disasters

From data to intelligence

Earth observation satellites today are capable of generating petabytes of data daily, creating unprecedented opportunities to understand our planet's dynamic systems. Yet this wealth of information often remains disconnected from the people and organizations who could benefit most. The gap between data collection and coordinated action represents both a challenge and an opportunity. Satellite imagery provides immense value when integrated with analysis and coordination mechanisms that help communities, businesses, and governments make informed decisions.

Space42 has developed an end-to-end solution addressing this connection. Our GIQ platform transforms multi-source satellite data into actionable intelligence through machine learning algorithms that identify environmental changes, track ecosystem health, and detect opportunities for sustainable development in real time. Intelligence is most powerful when paired with coordination, which is why our platform links analysis directly to decision-making through

intuitive storytelling that delivers insights to diverse stakeholders.

GIQ operates across anticipation, response, and recovery phases, reducing coordination time from hours to minutes while supporting civilian emergency management, urban planning, and resource optimization. During responses to various disasters, GIQ processes infrastructure imagery through automated assessment and coordinated support through unified interfaces. The integrated approach demonstrated broader value during the UAE's weather events in 2024, where GIQ's modeling enabled advance preparation for both emergency response and planning, and support for coordinating real-time resource allocation across multiple sectors.

This dual-platform architecture illustrates how geospatial intelligence can be embedded within everyday decision-making, extending across emergency preparedness, commercial innovation, and environmental stewardship to create more resilient and sustainable communities.



Intelligence to action

Geospatial intelligence serves multiple communities, providing early warning for environmental challenges while simultaneously enabling commercial sectors to operate more efficiently with enhanced sustainability. GIQ's continuous monitoring capabilities support precision agriculture through optimized irrigation and crop yield forecasting, helping farmers protect harvests, conserve water, and strengthen food security. These same capabilities enable oil and gas operations to reduce ecological impact through enhanced pipeline monitoring and site optimization, protecting both operational efficiency and surrounding ecosystems.

Applications extend naturally to smart city development and autonomous systems that improve daily life. Our collaboration with the Abu Dhabi Government's TXAI project demonstrates how geospatial intelligence enables autonomous transportation networks, reducing commute times and emissions while making cities more livable. In logistics and construction, real-time monitoring supports precision planning and resource allocation, creating more efficient operations with smaller ecological footprints while reducing costs for businesses and consumers.

Long-term resilience benefits reach across sectors and generations. Our research partnership with the Environment Agency Abu Dhabi, OceanX, and M42 exemplifies this approach, where marine ecosystem monitoring provides intelligence for both conservation planning and sustainable economic development, protecting coastal communities while supporting tourism and fisheries.

Whether supporting national security requirements or commercial operations, these platforms transform reactive approaches into proactive strategies that build resilient, prosperous, and sustainable communities where families can thrive.

Looking ahead

Space42's platforms function across diverse operational contexts, enabling both specialized analysts and field personnel to access intelligence through intuitive interfaces requiring domain knowledge rather than technical specialization. We measure success through outcomes that matter to people: community preparedness, infrastructure resilience, insights communication, and confidence in decision-making under pressure. These human-centered metrics guide our development more than purely technical performance indicators.

Our approach centers on augmenting human decision-making rather than replacing expertise, embedding geospatial intelligence within existing frameworks to enhance institutional capacity and strengthen communities. This philosophy aligns with Space42's strategic focus on satellite technology, geospatial mapping, and AI as interconnected capabilities that address terrestrial challenges while advancing space-based economic opportunities for everyone.

We believe that by turning data into foresight, we can help build communities that are more connected, economies that are more resilient, and a planet that is more sustainable for generations to come. The path forward illuminates how protecting people and the planet converges through intelligent action. As we stand at the intersection of accelerating environmental pressures and expanding economic possibilities, the fusion of AI, satellite technology, and coordinated response systems offers humanity unprecedented capability to anticipate, adapt, and thrive together. Space42's vision transforms this convergence into reality, where every satellite observation becomes a guardian for Earth's communities and ecosystems, and every algorithm serves as a bridge between knowledge and decisive action that safeguards our shared future.

**The path forward
illuminates how
protecting people and the
planet converges through
intelligent action.**

From importer to innovator: How the UAE is manufacturing the future of space

Khaled Al Marzooqi

CEO of Mira Aerospace, a subsidiary of Space42



The UAE has evolved from dependency on imported aerospace technologies to designing, building, and operating advanced platforms for global markets. This evolution establishes a new model for space leadership grounded in sovereign manufacturing capabilities and strategic vision.

At Mira Aerospace, we embody this transformation through our High-Altitude Platform Systems (HAPS) facility, where engineers on Emirati soil manufacture aircraft that operate in the stratosphere with precision and reliability.

I witnessed this transformation firsthand when we conducted the UAE's first HAPS flights on Abu Al Abyad Island, working directly with the Ministry of Defense. Watching our platform ascend to an altitude of 18 kilometers, equipped with advanced payloads designed in-house and locally built, proved that we could compete with established space and aerial powers through engineering excellence and manufacturing precision. Our technology unlocked entirely new domains as we pioneer operations in the stratosphere, positioning us at the forefront of the latest aerospace trends.

Filling the strategic middle layer

HAPS occupy the critical space between satellites and terrestrial infrastructure, creating a persistent middle layer combining orbital endurance with aerial flexibility. Flying at an altitude of 18 kilometers, above weather patterns and commercial aviation and below satellites, these platforms deliver continuous coverage with unique advantages: rapid deployment, real-time

repositioning, and direct line-of-sight to vast geographic areas.

This middle layer fills gaps that satellites and ground systems cannot address effectively. Satellites provide global coverage but require years to deploy and billions to replace. Terrestrial networks offer high capacity but limited range. HAPS bridge these limitations, providing persistent coverage that can be deployed within days and repositioned as needs evolve.

The strategic importance encompasses multiple domains. HAPS deliver high-resolution imagery for environmental monitoring, secure communications for defense applications, and connectivity for remote regions where traditional infrastructure proves uneconomical. This versatility makes them essential components of national resilience infrastructure.

HAPS occupy the critical space between satellites and terrestrial infrastructure.

Commercial applications drive economic value

The commercial potential of HAPS creates new opportunities across industries that depend on connectivity and real-time data. Rural broadband represents the defining application, with HAPS functioning as floating cell towers that deliver high-speed internet to underserved communities at a fraction of satellite costs.

Precision agriculture leverages the same connectivity infrastructure to revolutionize farming operations. HAPS provide continuous monitoring of crop health, soil conditions, and weather patterns through hyperspectral imaging and environmental sensors, enabling farmers to optimize irrigation, fertilization, and harvesting with unprecedented precision. These platforms simultaneously detect methane emissions and greenhouse gases for environmental protection. Nations managing vast territories or complex supply chains gain visibility through logistics monitoring. That tracks fleet movements, monitors pipeline integrity, and provides continuous coverage across remote terrain, translating directly into operational efficiency and security.

The same flexibility that serves commercial markets translates directly to dual-use applications for defense. HAPS deliver persistent monitoring capabilities through sophisticated sensors that hover over single points, supporting border protection, maritime monitoring, and airspace surveillance. With payload capacities up to 12 kilograms and the ability to monitor activities across multiple frequency bands while

maintaining position for extended periods, these platforms prove invaluable for national security missions.

HAPS require lower capital investment than satellite constellations while offering greater flexibility than terrestrial networks. This combination of affordability and capability makes cutting-edge connectivity accessible to emerging markets and specialized applications previously considered economically unfeasible.

Manufacturing sovereignty enables strategic agility

Manufacturing HAPS locally transforms the UAE from a technology consumer to a technology sovereign, controlling development timelines, customization requirements, and operational priorities. Our 4,400 square meter manufacturing facility in Abu Dhabi will produce more than 20 Unmanned Aerial Vehicles (UAVs) annually, each tailored to specific mission requirements. This production capacity creates industrial depth rare among nations, positioning the UAE as both user and supplier in global aerospace markets.

The strategic advantages extend beyond production. Local manufacturing enables rapid iteration, customization for regional requirements, and integration with national defense and economic priorities. Each platform achieves service life exceeding 10,000 hours while carrying sophisticated sensors and communications equipment. When international partners engage with us now, they recognize the UAE as a peer capable of contributing technology and expertise to collaborative projects.



The commercial potential of HAPS creates new opportunities across industries that depend on connectivity and real-time data.



Vision for space leadership

At Mira Aerospace, we see HAPS as the foundation for broader space capabilities that advance the UAE's National Space Strategy 2030. The engineering expertise, manufacturing processes, and operational experience gained through HAPS development translate directly to satellite systems, launch vehicles, and space-based infrastructure. This progression from stratospheric platforms to orbital systems reflects the natural evolution of aerospace capabilities, with economic implications extending across industries from precision agriculture to connectivity and environmental monitoring.

By building HAPS locally, we secure the nation's strategic position in space and contribute to the growing space economy. Our work positions the UAE at the forefront of global aerospace innovation, leading the latest aerospace trends and becoming the first country worldwide to regulate the stratospheric layer.

HAPS represent the beginning of a journey toward comprehensive space capabilities that serve national priorities while advancing human knowledge and capability.

Building HAPS locally, we secure the nation's strategic position in space and contribute to the growing space economy.



Why Africa must access its maps to shape its future

Dr. Yuliya Tarabalka

VP of Geospatial Solutions, Smart Solutions, Space42



Africa stands at a defining crossroads. With the world's fastest-growing population and vast natural resources, its potential for transformation is extraordinary. The decisive question becomes how the continent can access the data and insights needed to guide this transformation.

For too long, African nations have planned infrastructure, allocated resources, and responded to crises without reliable base maps that are consistently accessible. This data gap has become a strategic vulnerability that undermines both development goals and investor confidence.

The cost of fragmented data

The problem spans technical, economic, and political dimensions. Spatial data quickly loses value without regular updates, yet across the continent, maps exist only as fragments created by short-term projects. These efforts typically focus on a single city or district, ending when immediate needs are met and leaving behind data that becomes outdated, inaccessible, or lost entirely.

This fragmentation creates a cascade of consequences. Without trusted baseline information, agricultural projects cannot accurately assess risk or scale. Infrastructure investments proceed with incomplete intelligence. Climate adaptation strategies rely on estimates rather than evidence. The result is predictable: development banks hesitate, private investors demand higher risk premiums, and transformative projects struggle to secure funding.

Africa remains a continent without comprehensive base maps, and thus without the foundation for sustainable development or investor trust.

Breaking the cycle: map Africa's strategic partnership

The Map Africa Initiative represents a fundamental departure from this pattern. Over the next five years, Space42, Esri, and Microsoft intend to collaborate with African governments and institutions to produce the most comprehensive base map of Africa ever created. Covering all 54 countries and serving 1.5 billion people, the initiative's most important feature is its strategic partnership model designed to ensure sustained access and capacity building.

This approach delivers four critical elements that previous efforts lacked. First, guaranteed access through long-term licensing agreements which provide African governments with reliable, ongoing access to comprehensive mapping data, with pricing models that reflect development priorities and economic realities.

Second, local capacity building. Space42 and Esri will establish regional hubs to train local experts and transfer technical knowledge, ensuring that the skills to utilize and extend mapping infrastructure are embedded within African institutions.

Third, African partnership governance. Governments across the continent are engaged as strategic partners to guarantee alignment, ensure the initiative reflects continental governance priorities, and address national development needs.

Finally, sustained technology access. Space42 provides cutting-edge satellite data access and AI-powered digital twin models to transform raw imagery into actionable intelligence. Esri orchestrates advanced base map production workflows using GeoAI and remote sensing. Microsoft delivers secure, scalable cloud infrastructure to handle the vast data volumes required. Together, these partnerships ensure Africa gains reliable access to world-class mapping capabilities while building the expertise to maximize their value.



Live maps: a strategic asset

The initiative's most significant innovation lies in producing live maps: dynamic, continuously updated representations of reality. This capability transforms how Africa can leverage geospatial intelligence and fundamentally changes the continent's development trajectory.

For governments, live maps mean monitoring floods as they spread, tracking power grid failures as they occur, and observing urban growth as it unfolds. For agriculture ministers, they mean accurate forecasts of crop yields and ensuring that food security strategies are based on evidence rather than estimates. For entrepreneurs, they mean a trusted dataset on which to build new services that fuel Africa's digital economy. For investors and development banks, they provide confidence that projects are planned with accurate information.

By ensuring sustainable access to live mapping capabilities through strategic partnerships, the initiative guarantees that this advantage grows stronger as the continent becomes more connected and urbanized.

Addressing sustainability and access

Skeptics rightfully ask whether Map Africa creates sustainable access or introduces new dependencies. The initiative's partnership model directly addresses this concern through several key mechanisms.

Unlike earlier aid-driven efforts that created temporary visibility, Map Africa builds permanent capabilities through technology and skills development. The commercial partnership structure ensures long-term viability while providing African institutions with the tools and training to maximize mapping data value.

Most importantly, the focus on capacity building means that African institutions develop the expertise to create additional data layers, perform advanced analytics, and integrate mapping insights into decision-making processes, capabilities that extend far beyond the base mapping data itself.





A template for strategic data partnerships

Africa's mapping deficit is extreme, but it is not unique. Many countries in Latin America and Asia struggle with incomplete datasets and outdated maps. Yet, only Africa faces the near-total absence of proper base maps across almost every country, making this initiative both urgent and globally significant.

By demonstrating that strategic partnerships can deliver comprehensive mapping capabilities while building genuine local capacity, Map Africa establishes a new model for how nations can access advanced technologies through sustainable commercial arrangements. Success here creates a blueprint that other regions can adapt, proving that satellites, AI, and cloud infrastructure can be accessed through partnerships that deliver both technical capability and knowledge transfer.

The choice ahead

At its core, mapping is about visibility. Today, it is also about access and capability. African nations face a decisive choice: continue a path of fragmented, short-term mapping efforts that leave gaps and dependencies; or embrace strategic partnerships that provide comprehensive, sustained access to continental-scale mapping capabilities while building local expertise.

Through the Map Africa initiative, the choice is clear. Africa gains the capabilities to use maps effectively - creating the foundation for evidence-based development, investor confidence, and continental transformation.

Map Africa builds permanent capabilities through technology and skills development.

SPACE42

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When outside cellular coverage, make calls and send text messages via your SAT SIM. Simply extend the antenna, switch to SAT Mode, and aim your phone skyward—or use the built in SatFinder app to locate the satellite for easier connection.

SAT SIM



THURAYA ONE

THE BEST OF **BOTH WORLDS**

THE POWER
OF **ONE**

IN COVERAGE? **USE 5G**

When you're within range, Thuraya One functions like any other 5G smartphone. Make calls, send messages, browse online, and stream — all via your GSM SIM.

GSM SIM



Autonomous mobility



3.1 / AI, autonomy and redefining the next era of mobility

3.2 / Building the foundations for autonomous mobility



AI, autonomy, and redefining the next era of mobility

Interview with Dr. Fan Zhu

SVP, Autonomous Mobility, Space42



Mobile autonomy is often seen as futuristic and far-off. How is Space42 turning it into a reality in the UAE?

Space42 is making autonomy a reality in the UAE by deploying large-scale autonomous mobility systems that are safe, reliable, and scalable. Since 2021, we have logged nearly 600,000 kilometers of autonomous driving and completed 20,000 passenger trips with zero accidents through TXAI, our flagship robotaxi. What began as a pilot project now operates across Saadiyat Island, Yas Island, Al Maryah Island, Al Reem Island, and Abu Dhabi Airport.

This progress is powered by the broader system supporting each vehicle. A Digital Twin of Abu Dhabi, combined with real-time imagery, transforms every trip into data which strengthens the entire mobility network. The result is a service that delivers trust, efficiency, and consistency at scale.

**20,000
passenger
trips with zero
accidents
through TXAI.**

The next leap comes from convergence. By fusing AI, Earth Observation, IoT, and geospatial analytics, Space42 is creating adaptive systems that reshape how societies move, connect, and grow. This is how autonomy shifts from promise to reality, and how technology becomes a force for societal transformation.

Public transport is often seen as the toughest test for autonomy. What does it take to make autonomous buses and shuttles work across entire cities?

Public transport is uniquely complex. Autonomous buses and shuttles must safely navigate interactions with cars, pedestrians, and emergency responders, while adapting to congestion, signals, and sudden road changes.

Success begins with clear regulations, strong testing frameworks, and insurance models that define responsibility and ensure safety. These safeguards build the trust needed for large-scale deployment.

Globally, cities are still in trial phases, investing in infrastructure such as Vehicle-to-Everything (V2X) networks, high-precision positioning, and dynamic mapping. Authorities are also aligning service delivery with rapid innovation cycles, introducing new metrics to measure adoption and efficiency. Intelligent transport systems further enhance performance by optimizing routes in real-time matching passenger demand.

Together, these steps pave the way for safer, smarter, and more resilient urban mobility, turning today's complexity into tomorrow's opportunity.



Everyone talks about self-driving cars, but what's the bigger, less visible transformation that's actually shaping the future of mobility?

The vehicles we see on the streets represent only one layer of a deeply interconnected mobility network. The real transformation lies in the AI engines behind them, combining advanced models, fast computing power, and the ability to process vast streams of data.

Unlike humans, who learn to drive quickly, autonomous systems improve gradually. Their strength comes at scale, when AI evolves from piloting single vehicles to orchestrating entire fleets, ultimately reshaping how transportation and society itself function.

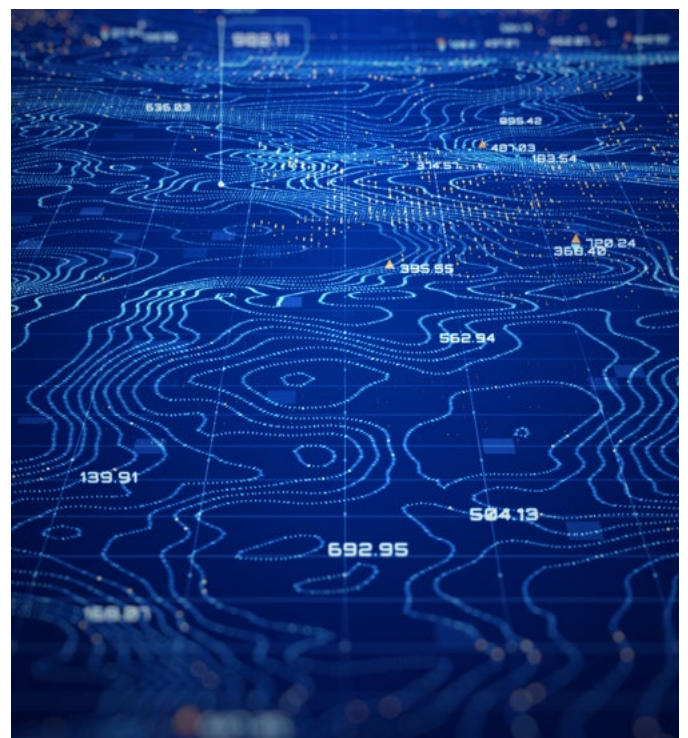
At Space42, our digital infrastructure makes this possible. From mapping engines and Digital Twins to sovereign mobility cloud environments, we are laying the foundation for agentic AI models that manage journeys end-to-end. By linking taxis, shuttles, buses, and charging networks into one intelligent system, fragmented transport becomes a unified network that predicts demand, adapts routes, and responds to

When the stakes are highest, in defense missions or disaster response, how can autonomy make the difference between disruption and resilience?

Defense and disaster environments demand resilience under extreme unpredictability, whether it's shifting terrain, damaged infrastructure, or life-saving missions. Autonomy makes the difference by enabling convoys to reroute around blockages, helping aid vehicles adapt to sudden changes, and keeping fleets coordinated in real time.

Space42 has already proven this in action. Our technology has supported end users across deserts, mountains, and maritime corridors. At the core is a fusion of AI coordination, remote control, and Digital Twin command centers that give decision-makers live situational awareness and the ability to redirect fleets instantly.

That's why adoption in defense logistics and humanitarian response is advancing rapidly. By combining satellite reach with AI-driven decision making, Space42 equips operators with fleets that adapt immediately to evolving conditions, ensuring missions continue, even under the most challenging circumstances.



What makes the UAE such a powerful launchpad for next-generation mobility, and how is Space42 helping shape it into a global hub?

The UAE has become a global launchpad for next-generation mobility by placing AI at the center of its economic transformation. Guided by the National AI Strategy 2031, the country has paired bold vision with practical investment in infrastructure, governance, and institutions to turn ambition into deployment.

At the center is Mohamed bin Zayed University of Artificial Intelligence (MBZUAI), which anchors the nation's talent pipeline and research base. Initiatives like K2 Think, created with G42, highlighting Abu Dhabi's strength in AI R&D and its ability to translate insights into applied technologies. This ecosystem is reinforced by leadership from the Smart Autonomous Systems Council, the Integrated Transport Centre, Abu Dhabi Investment Office (ADIO), and the Smart and Autonomous Vehicle Industries (SAVI) cluster, together defining roadmaps, enabling fleet integration, attracting innovators, and building sovereign capacity.

Within this framework, Space42 has been at the forefront since 2021, when it launched TXAI. Since then, we have expanded into HD maps, Digital Twins, and Sovereign Mobility Cloud, providing the backbone for intelligent mobility. By working with regulators, investors, and universities, we ensure innovation advances safely and at scale.

The result is an ecosystem where the UAE provides the vision and policy leadership, while Space42 delivers the operational and technological edge, together setting global benchmarks for mobility.



When you look at the next decade of autonomous mobility, what breakthroughs excite you most? Not just for vehicles, but for societies as a whole.

The next breakthrough will be the convergence of physical AI and agentic AI models. Generative AI has already proven its ability to create insights and content, but the real leap comes when discriminative models built to make context-aware decisions in the physical world are scaled. These models will allow machines to act with intelligence in complex, real-world environments.

Researchers point to Large World Models as the next frontier. Designed to manage real-world decision-making, they span applications from autonomous driving to humanoid robotics. They require vast data and compute power, holding the promise of navigating the unpredictability of physical and social systems in ways today's AI cannot.

This convergence will define next-generation mobility. Agentic AI will orchestrate interactions, while physical AI executes them in the real world. Together, they will optimize daily life, planning multimodal journeys, coordinating human and AI agents, and ensuring societies move in safer, smarter, and more efficient ways.



A hand reaching out towards a stream of glowing blue digital data points, symbolizing the convergence of physical and digital worlds.

The next
breakthrough
will be the
convergence
of **physical AI**
and **agentic**
AI models.

Building the foundations for autonomous mobility

The UAE is at the forefront of adapting new technologies to make life easier and more efficient. Autonomous mobility is no different.

Space42 is showing how scalable infrastructure for autonomy is taking shape through cloud, mapping, and deployment partnerships, moving the UAE closer to sovereign, road-ready services.

Sovereign cloud as the command center

Every autonomous system depends on secure, scalable data. Together with Core42 and Microsoft, Space42 is creating the UAE's first Sovereign Mobility Cloud. Hosted locally, it will provide trusted environments for HD mapping, telematics, fleet operations, traffic management, and digital twins.

The cloud is designed as the digital command center of autonomy. It anchors data within national borders, ensures compliance with UAE regulations, and creates a platform where innovation can be tested through regulatory sandboxes before deployment at scale.

For citizens, a trusted cloud means safer journeys, quicker responses to congestion, and services that work reliably from the first ride. From smoother daily commutes to better-integrated public transport, the Sovereign Mobility Cloud makes travel smarter, faster, and more predictable.

Mapping the future of driving

Maps are the operating system of autonomy. In partnership with Dynamic Map Platform, Space42 is bringing world-class HD mapping to the UAE, turning LiDAR point clouds into lane-level precision data that enables hands-free driving.

Building on the partnership with Dynamic Map, a long-term agreement with General Motors ensures that Super Cruise, one of the world's most advanced driver-assistance systems, can function seamlessly on UAE roads. Already proven across nearly a million kilometers in North America, Super Cruise will arrive in the UAE with the confidence of global deployment, powered locally by sovereign data collection and processing.

The partnership combines four strengths:

1

Lane-Level Precision:

LiDAR-derived maps provide detailed information for precise positioning and smoother lane changes.

2

Expanded Coverage:

Surveys of main UAE roads extend the reach of hands-free driving.

3

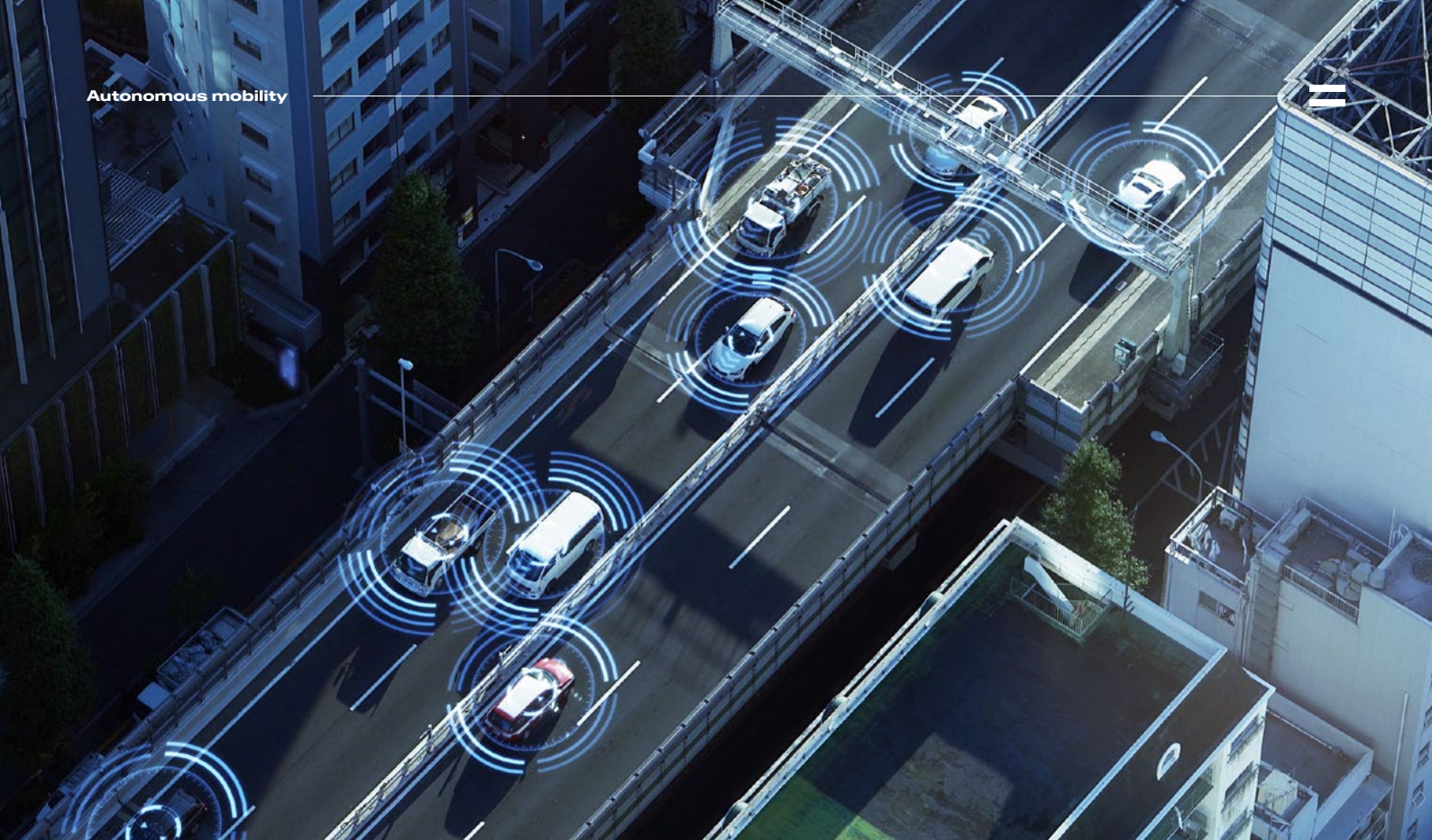
Continuous Updates:

Frequent re-surveys reflect roadworks and upgrades, keeping maps current.

4

Seamless Integration:

Data processed on the Sovereign Mobility Cloud ensures smooth incorporation into Super Cruise.



For drivers, this means safer lane changes, fewer surprises from roadworks, and a driving experience that feels more secure.

Mobility as a strategic pillar

At Space42, autonomous mobility is a core pillar of our strategy to become a global leader in geospatial intelligence, AI platforms, and services. While our portfolio spans satellite communications, Earth Observation, and AI, mobility is one clear way that space capabilities translate into services that touch everyday life.

By fusing geospatial data with terrestrial transport, Space42 is proving the scalability of its analytics model. Each initiative advances the long-term ambition to apply intelligence

developed in space to strengthen the infrastructure that nations and citizens depend on.

A national testbed with global reach

Together, these initiatives form a coherent ecosystem: sovereign cloud platforms, interoperable HD maps, and deployment through international automotive manufacturers. Each strengthens the others, allowing innovation to move quickly from pilots to city-wide services.

The advancements support the UAE's reputation as a hub where global technologies are adapted to national standards, where regulation is intuitive and infrastructure is adaptable, where autonomy is tested at scale, and where the future of mobility is demonstrated to the world.

Together, these initiatives form a coherent ecosystem: **sovereign cloud platforms, interoperable HD maps, and deployment through international automotive manufacturers.**

Community and culture

4.1 / From classrooms to space command centers



From classrooms to space command centers

Training the UAE's space generation

Maymee Kurian

Chief Human Capital Officer, Space42



The UAE's ambitions in space rest on a foundation most people overlook: education. Over the past two decades, the nation has transformed its education landscape with remarkable speed and purpose. Education, innovation, and inclusion now work in harmony, forming a system designed to unlock opportunity and drive national progress.

STEM sits at the heart of this transformation, embedded in Vision 2031 and the UAE's national strategies for AI and space. Universities such as Khalifa University and the Mohamed Bin Zayed University of Artificial Intelligence are fueling breakthroughs, from the Mars Hope Probe to large language models like JAIS. In schools, initiatives such as One Million Arab Coders are inspiring students to see technology as their future.

The results are clear: over 30% of UAE graduates come from STEM fields, placing the country among global leaders. Women continue to drive this progress; 61% of STEM students in the UAE are female, one of the highest rates worldwide. These young women bring a sense of purpose and drive that reminds us what the future of space can look like when opportunity meets belief.

Turning curiosity into careers

In late 2024, as Space42 prepared for the Thuraya-4 satellite launch, a partnership with the Ministry of Education gave students a rare, behind-the-scenes view of the space industry.

Over six weeks, classrooms gave way to command centers. Students toured facilities, stepped into live satellite control rooms, and

spoke directly with mission engineers. At Thuraya's offices, they engaged in hands-on exercises with one of the region's most advanced space systems.

These experiences show how collaboration between education, government, and industry transforms learning into leadership, turning classroom curiosity into careers that advance national capability.

For many, it was the first time they could imagine themselves not just as students, but as future mission controllers, data scientists, and space leaders.

30%

of UAE graduates come from STEM fields

61%

of STEM students in the UAE are female



Training future leaders

For professionals further along in their career, the National Space Academy, developed with the UAE Space Agency, provides a bridge from ambition to expertise.

The latest cohort, held between May and July 2025, brought together UAE nationals from government, private, and academic sectors. At the Academy, learning happens alongside operations. Trainees work directly with engineers, analysts, and satellite teams, engaging with the same platforms that sustain the UAE's space infrastructure.

Every module connects learning with purpose. The Academy stands as proof that capability grows where opportunity, experience, and national ambition intersect.

To complement this, the Space42 Accelerator Program is designed to develop leaders of the future by setting top Emirati graduate hires on a fast-track career path through on-the-job, self, and peer learning and development. The program ensures that high-potential talent is equipped with both the technical expertise

and leadership mindset needed to contribute meaningfully to the UAE's growing space ecosystem.

Together, these initiatives form a continuous pathway for growth, from early education to leadership, reflecting Space42's belief that the nation's future in space will be built by the people it invests in today.

Talent powers sovereignty

At Space42, the UAE's path to leadership in space is seen as a human story, one that begins with education, grows through collaboration, and succeeds through people who carry the nation's ambition forward.

Talent remains the most powerful engine of sovereignty, and nurturing it requires capability, inclusion, and shared ambition. Every partnership, every program, and every mission reflects this belief, that the future of space will be shaped by people whose curiosity today defines the UAE's tomorrow.

Beyond horizons

The background of the slide is a composite image. The top half shows a deep blue space with a bright, glowing blue arc of light, possibly representing a celestial body or a satellite's path. The bottom half shows a view of Earth from space, with a thin blue line of the atmosphere separating the dark land and oceans from the bright light of the sun. The Earth's surface is visible, showing landmasses and bodies of water.

5.1 / From visibility to value: Why SAR intelligence
Is a crucial strategic asset

5.2 / Awards and achievements





From visibility to value: Why SAR intelligence is a crucial strategic asset

On February 6, 2023, at 4:17 AM local time, a 7.8 magnitude earthquake struck southeastern Turkey. Within moments, tremors reached the Atatürk Dam, holding back nearly 49 billion cubic meters of water and safeguarding millions of lives downstream. The immediate question confronting emergency teams was whether the dam was structurally sound.

Traditional monitoring systems failed at the very moment they were needed most. Optical satellites were blinded by cloud cover. Ground sensors collapsed. Dust, debris, and severe weather obscured visibility.

Yet, Synthetic Aperture Radar (SAR) satellites cut through the chaos. Operating in all conditions, SAR confirmed the structural integrity of the dam and provided clarity where every other system faltered. It demonstrated both practical utility and essential strategic value.

Global infrastructure is scaling at historic levels.

How sar became a national imperative

This moment crystallized SAR's unique value: the ability to transform raw imagery into decision-grade intelligence, guiding both national response and international coordination. In high-stakes environments, the ultimate measure of success is the lives preserved. Once the dam's structural integrity was confirmed, emergency teams were able to deploy resources strategically rather than reactively.

Situations like this highlight how a single point of infrastructure can have national and even regional consequences, emphasizing why governments and industries need to reevaluate the systems they depend on for intelligence. The global landscape for infrastructure and security investment is undergoing unprecedented transformation. Annual capital project spending now exceeds \$9 trillion, while global defense expenditure reached nearly \$3 trillion in 2024. Such investment levels create both opportunity and exposure: the resilience, productivity, and strategic value of these assets increasingly hinge on the quality of geospatial intelligence and the systems that deliver it.

Infrastructure expansion, monitoring gaps

Global infrastructure is scaling at historic levels, with cumulative investment projected to exceed \$79 trillion by 2040. The Gulf alone accounts for \$2.6 trillion, driven by transformative programs in Saudi Arabia and the UAE. Defense spending, averaging nearly 6% of GDP across the region, adds another layer of strategic demand.

Yet the tools used to monitor this infrastructure are falling behind. Optical satellites fail in storms. Ground sensors collapse in floods. Manual image analysis takes days when leaders need answers in minutes.

The result? Gaps in monitoring during the very moments we need it most, be it for ports handling billions in trade, a power grid supporting entire cities, or border zones critical to national sovereignty.

The future of intelligence delivery

Space42 has developed SAR intelligence as a complete infrastructure, extending well beyond a satellite service. First, our Foresight constellation captures high-resolution SAR imagery in any weather condition. Then our AI-driven analytics platform GIQ converts that imagery into real-time insights. Finally, our response coordination system ensures those insights are delivered directly into decision workflows. Each layer replaces legacy delays with decision-grade precision and complete operational autonomy.

This integrated approach highlights the dual-use character of SAR ecosystems, serving both civilian infrastructure resilience and national defense requirements simultaneously.

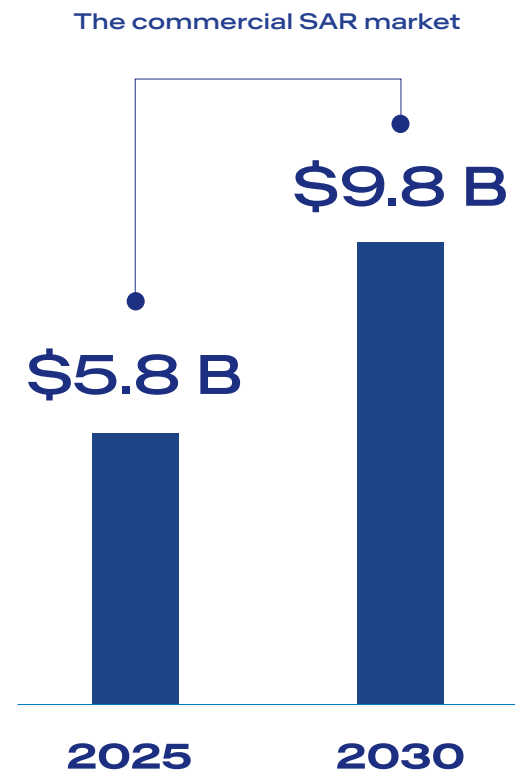
Economic, operational, and strategic payoff

The payoff is profound. Predictive maintenance costs can fall by up to 30%, emergency response times can shrink by 90%, and operational inefficiencies can be reduced by a quarter.

In the Gulf region, the SAR intelligence market is estimated at \$1–2 billion annually for infrastructure alone, with defense expanding that opportunity significantly. Globally, the sector is projected to grow from \$5.8 billion to \$9.8 billion by 2030, reflecting recognition that continuous, weather-independent monitoring has become an operational necessity.

Beyond efficiency and market growth, SAR reinforces national sovereignty. By enabling

governments to generate and analyze intelligence independently, SAR reduces reliance on external monitoring and safeguards sensitive data. Platforms like GIQ allow organizations to build custom analytics locally, accelerating insights while preserving control. This self-sufficient approach is increasingly central to both economic competitiveness and strategic security.



Vision that never blinks

The future of intelligence will be defined by the ability to translate visibility into decisive action. Integrated SAR ecosystems are emerging as the new strategic asset, where insight meets immediacy, and sovereignty meets scale.

For national leaders, infrastructure planners, and defense strategists, the competitive advantage lies in knowing what to do faster and with greater accuracy. The nations that neglect to invest in modern geospatial intelligence risk falling behind in security, infrastructure readiness, and global leadership.

In an era defined by uncertainty, leadership is measured by the ability to see ahead and act with precision. Foresight extends beyond anticipation; it represents the constellation enabling smarter decisions for the world we are building today.

Arabian Business

Karim Sabbagh 150 Most Influential Arabs, 'Disruptors' category

Sep 2025



Ali Al Hashemi appointed as Chairman of the GSOA

Sep 2025



TXAI – Smart City Transportation Award

Sep 2025



Thuraya-4 – AI Satellite Award

Sep 2025



Brand That Matters in Logistics and Mobility of 2025

July 2025



Thuraya - Best in Connectivity Solutions

May 2025

Future Fit Seal
May 2025

مكتب التطوير الحكومي والمستقبل
GOVERNMENT DEVELOPMENT & THE FUTURE OFFICE



Strategic Partner
Apr 2025

TDRA | هيئة تنظيم الاتصالات والحكومة الرقمية
TELECOMMUNICATIONS AND DIGITAL
GOVERNMENT REGULATORY AUTHORITY

Company to Watch
Mar 2025



Most Innovative Company in
Logistics & Mobility of 2024
Dec 2024

FASTCOMPANY
MIDDLE EAST

Satellite Solutions Provider
of the Year
Nov 2024

BROADCASTPRO
MIDDLE EAST

Strategic Transaction
of the Year Award
Sep 2024





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