HIPERSFERA

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SOCIETAL CHALLENGES

CONNECTIVITY

CHALLENGE:

- **Half of the world's population** still **does not have** proper access, or **any access to** modern **telecommunication** services, significantly reducing societal efficacy.

AGRICULTURE

CHALLENGES:

- Systemic production risks accentuated by climate
- Input costs prevent optimal agro management, reducing crop yield quality and quantity

TRANSPORT

CHALLENGES:

- Monitoring
- Optimization
- Automation
- Mapping
- Connectivity

FOREST MANAGEMENT

CHALLENGES:

- Biomass & Wildlife Mapping & Management
- Timber Exploitation
- Wildfires
- Natural Disasters
- Poaching
- Illegal Lodging

HiperSfera TERA
LIFTING UP THE INCLUSIVE INDUSTRY 4.1

HiperSfera TERA is a new type of infrastructure for the Industry 4.0, for the existing advanced mass-market data service providers.

It empowers service operators to provide equivalent or significantly better service, at a disruptive increase of the operational efficiency and decrease in per-user cost.

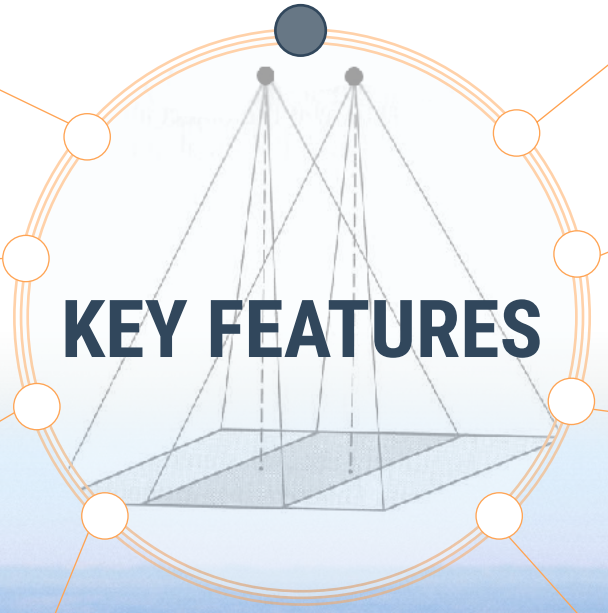
HiperSfera TERA uniquely features Persistent Aerial Positioning as a Service (PAPaaS), offering cost-effective way to provide robust and reliable mass-market access of 4.0 data services, inclusive to previously commercially non-viable **“other three billion”** part of the society.

PERSISTENT AERIAL POSITIONING AS A SERVICE

With the ability to continuously operate from weeks to months at a time, carrying up to 120kg of payload with up to 10kW of payload power, and supporting fleet operations in an effective and affoardable manner, HiperSfera Airships uniquely feature **Persistent Aerial Positioning as a Service (PAPaaS)**.

Hipersfera Airships are the only technology that can fulfill all these requirements.
No other existing or planned space, stratospheric or tropospheric flying platform offers a commercially or physically viable alternative.

KEY FEATURES



AVAILABILITY
24/7/365, at 95% or 99.5% availability

SERVICE AREA
tens to thousands of km^2

SPATIAL, TEMPORAL, SPECTRAL RESOLUTION
not limited by technology

REVISIT TIME
from real-time continuous to daily revisits

FLIGHT OPERATIONS
time-critical, robust & stable

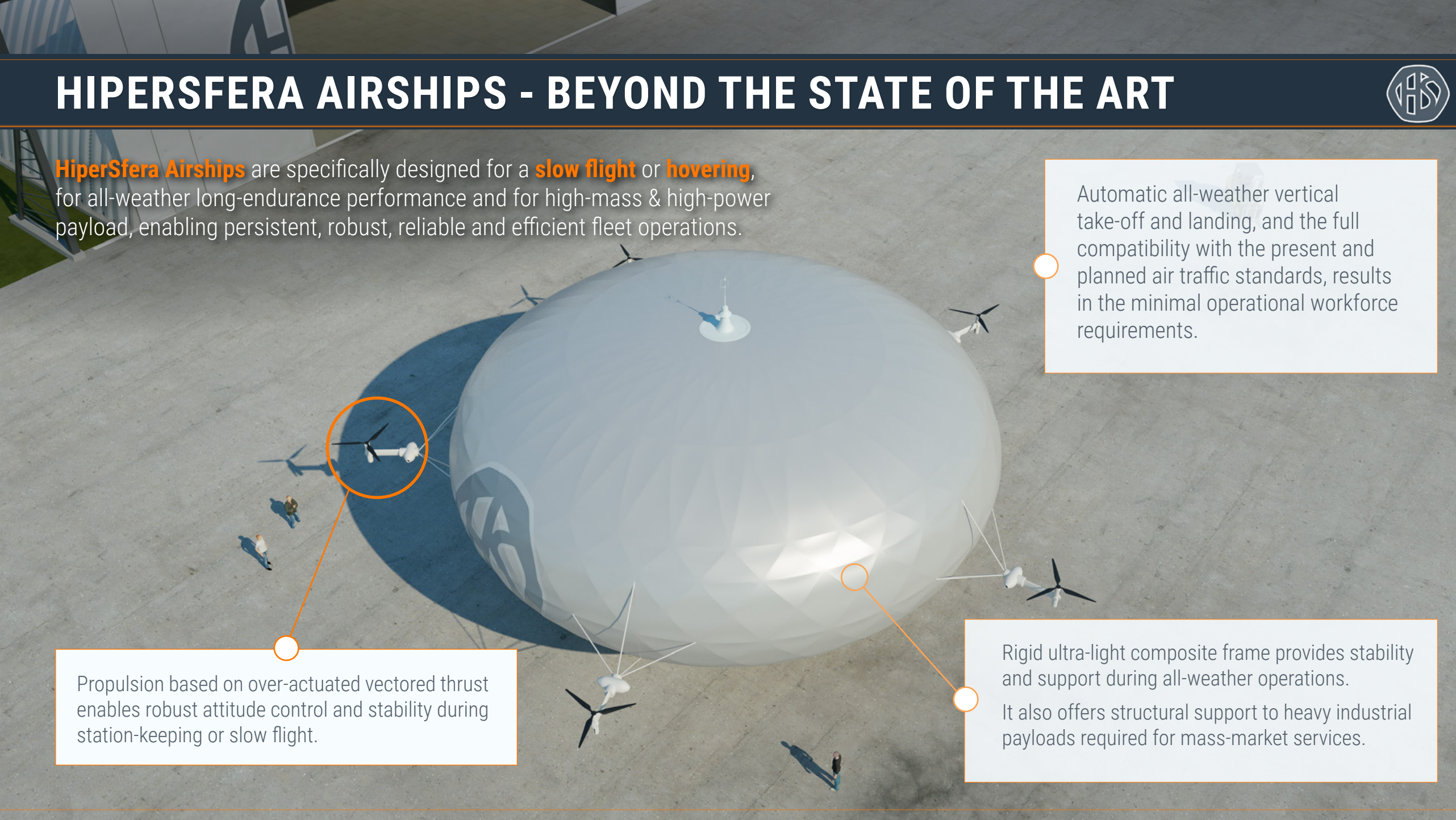
SERVICE CAPACITY
industrial payload capability

SAFETY & COMPLIANCE
safe in uncontrolled airspace above populated areas

MARKET & SCALABILITY
cost effective for commercial mass-market data services

HIPERSFERA AIRSHIPS - BEYOND THE STATE OF THE ART

HiperSfera Airships are specifically designed for a **slow flight** or **hovering**, for all-weather long-endurance performance and for high-mass & high-power payload, enabling persistent, robust, reliable and efficient fleet operations.



Automatic all-weather vertical take-off and landing, and the full compatibility with the present and planned air traffic standards, results in the minimal operational workforce requirements.

Propulsion based on over-actuated vectored thrust enables robust attitude control and stability during station-keeping or slow flight.

Rigid ultra-light composite frame provides stability and support during all-weather operations.

It also offers structural support to heavy industrial payloads required for mass-market services.

HIPERSFERA AIRSHIPS - BEYOND THE STATE OF THE ART

HiperSfera - a lighter-than-air semi-autonomous UAV that combines the endurance and payload capacities of modern airships with the dynamical agility of multi-rotor drones using thrust vector control.

HiperSfera UAV airships feature fully autonomous control of the commercial-service phase of fllight, including the participation in the planned Open Skies framework of air-traffic, with autonomous Sense-and-Avoid capability.

These features leave ground operator primarily in the corrective oversight role, allowing concurrent control of multiple airships by a single human pilot.

Axi-symmetric hull shape allows maintenance of directional orientation regardless of wind direction, increasing safety and robustness of VTOL and commercial-service phases of flight.

Multi-role payload capacity, using standardised robust industrial payload power and data interfaces, enhances the portfolio of potential service applications.

MOORED FLIGHT AND STATIC OPERATIONS

99.5% **AVAILABILITY** 95%

Ground operations during moored flights have a very small footprint, and **do not require any pre-existing infrastructure**; supporting **unparalleled speed and reach of service-deployment**, including large inaccessible ground areas.

FREE FLIGHT FOR PERSISTENT REVISITING

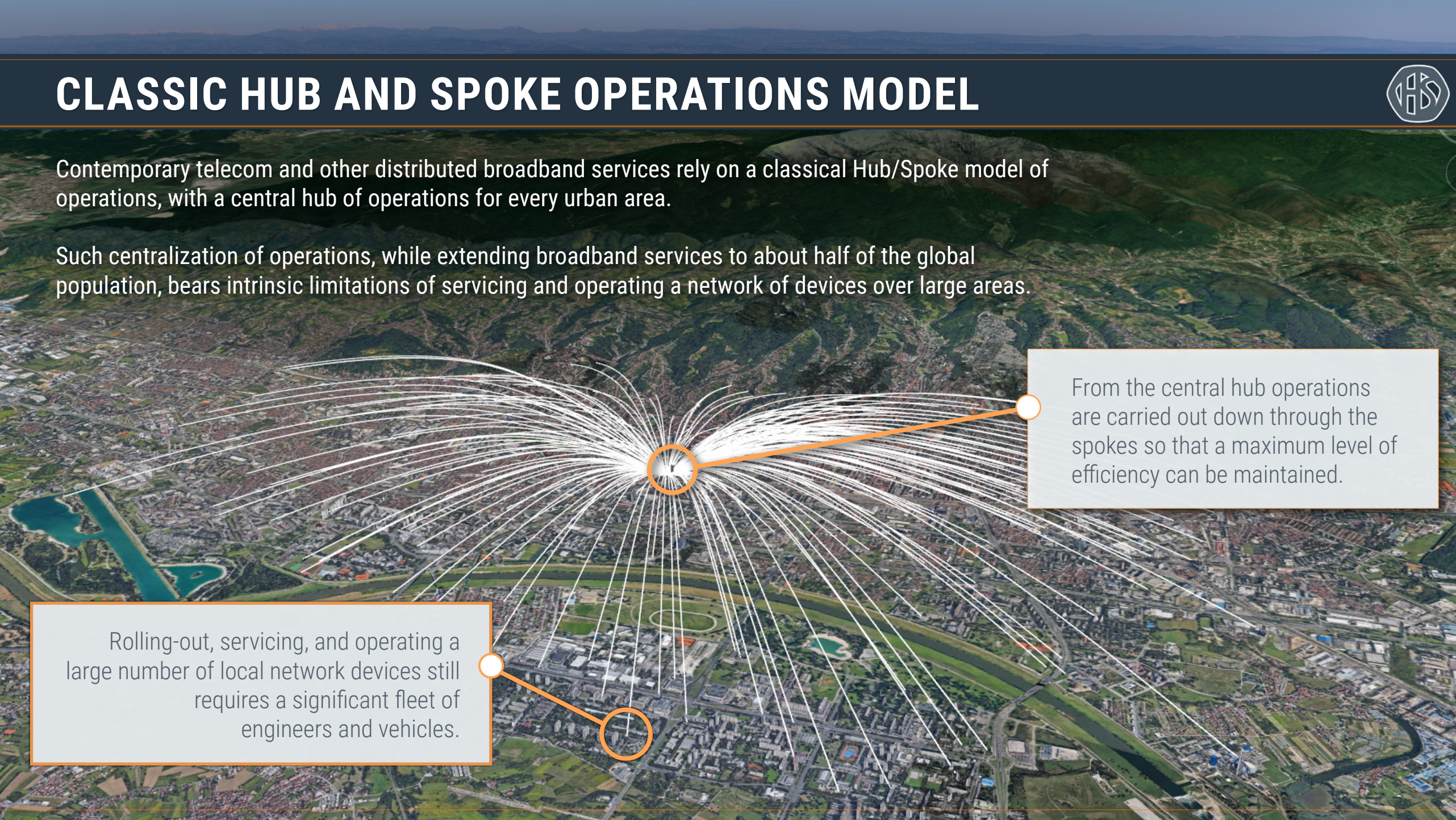
Free flying HiperSfera Airships are typically used in ultra-high resolution remote sensing applications requiring frequent revisit* over ground areas of hundreds to hundreds of thousands square kilometers**.

* revisit rate from seconds to days
** areas larger than 1,500 km^2 usually require fleet operations

CLASSIC HUB AND SPOKE OPERATIONS MODEL

Contemporary telecom and other distributed broadband services rely on a classical Hub/Spoke model of operations, with a central hub of operations for every urban area.

Such centralization of operations, while extending broadband services to about half of the global population, bears intrinsic limitations of servicing and operating a network of devices over large areas.



From the central hub operations are carried out down through the spokes so that a maximum level of efficiency can be maintained.

Rolling-out, servicing, and operating a large number of local network devices still requires a significant fleet of engineers and vehicles.

HIPERSFERA'S SPOKE

HiperSfera Airship is designed to serve as a **new kind of spoke** for a broadband distributed network, **extending** the traditional hub/spoke **efficiency by one to two orders of magnitude**.

HS Airship is a **normal participant** of the **air traffic flow**, using autonomous but correctable flight planning, transponders, communication with the ATC, and sense-and-avoid functionality.

It is a **two-fault-tolerant aircraft**, rugged and **safe for operations** over **densely populated** areas.

Multi-instrument payload capacity enables coverage of the large ground area in multiple cells

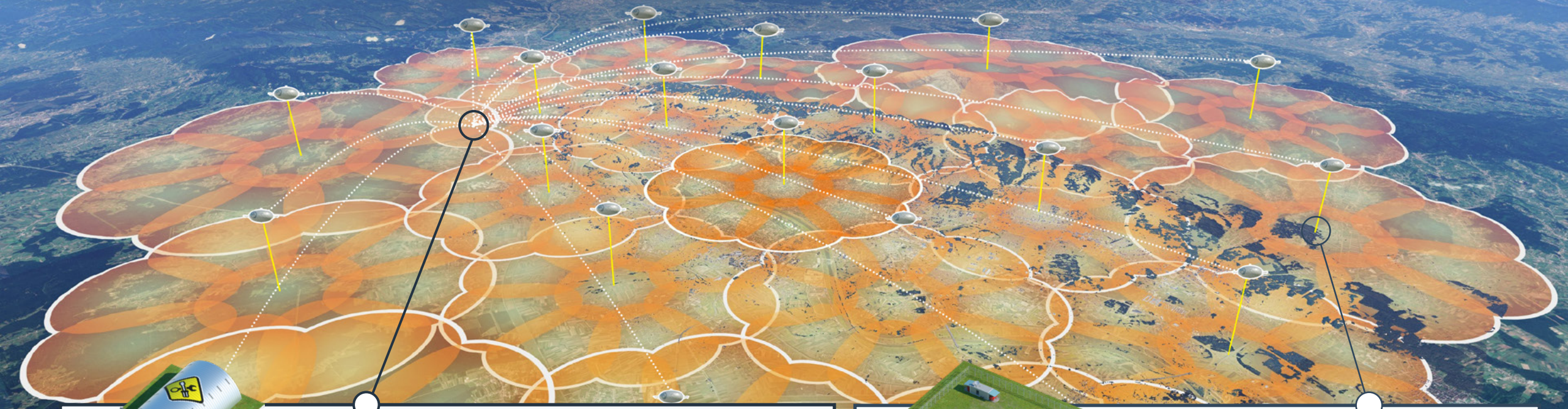
(cells shown here are symbolic and not a realistic representation of the last-mile elements of the mobile broadband network)

HIPERSFERA'S HUB AND SPOKE

HiperSfera's hub and spoke has three distinguishing features distinguishing it from the terrestrial H&S OPS model:

- larger area of operations
- OPS and MRO centers at one physical location for the entire airship fleet
- significant OPS and MRO work-force requirements reduction, typically 80-90%

These features are major contributers to HiperSfera's low per-service-user cost of operations, typically at 10-30% of terrestrial H&S per-client costs for the same or better service.



Most of the maintenance and servicing of the airship fleet and its service component is done at one central hub. This approach enables service providers to cover thousands of square kilometers of the ground with personnel measured in dozens.

At the end of its mission, a HS Airship hands-off provided services to its replacement and returns to the hub / base for refueling and maintenance. Service for the end-user continues uninterrupted.

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High-bandwidth laser and microwave communication: air-to-air and air-to-ground.
Fast network reconfiguration can compensate for possible knockout of a HiperSfera's hub

HIPERSFERA - AGROTERA

AgroTERA is a next-generation remote sensing platform specifically designed for applications in high-precision agriculture. It offers an unprecedented level of spatial and temporal monitoring of crops over large areas.

HIPERSFERA - FORESTERA

ForesTERA is a high-precision remote sensing platform specifically designed for applications in forest ecology. It is the ultimate high-resolution remote sensing solution for smart management of large forest areas.

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Thank you for the attention from the HiperSfera team!