

AALTO



ZEPHYR

THE FUTURE IS STRATOSPHERIC

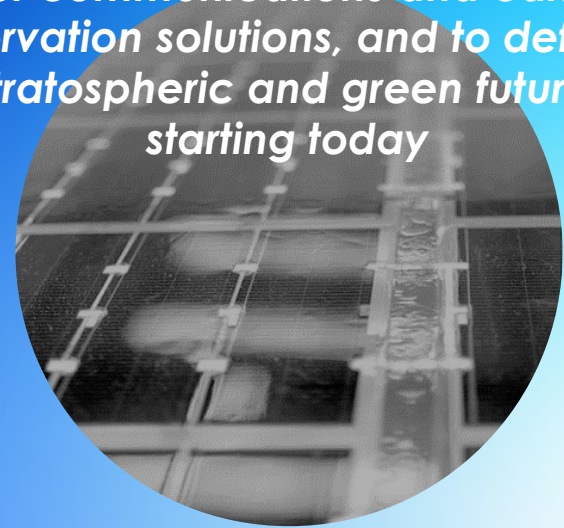


Stratospheric Systems: A Technology for Current and Future Generations

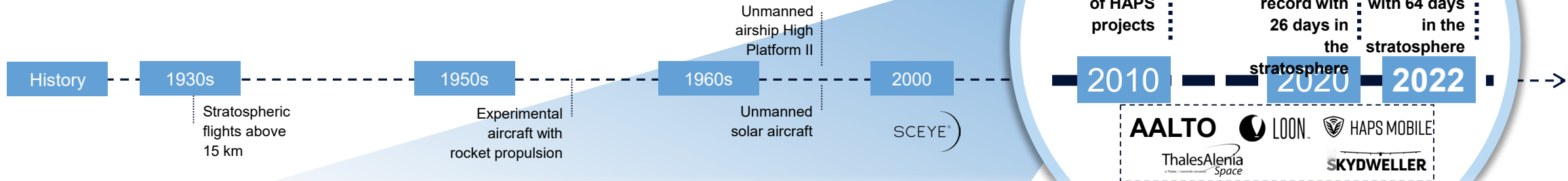


**AALTO will deliver a
stratospheric future for all**

*Our vision is to reimagine
connectivity, to create a new frontier
for communications and earth
observation solutions, and to define a
stratospheric and green future,
starting today*



High Altitude Platform Stations: Technology To Build a Better Future, Ready Now



Key HAPS building blocks now mastered...

...leading to the development of state-of-the-art platforms...

...enabling applications highly demanded by customers

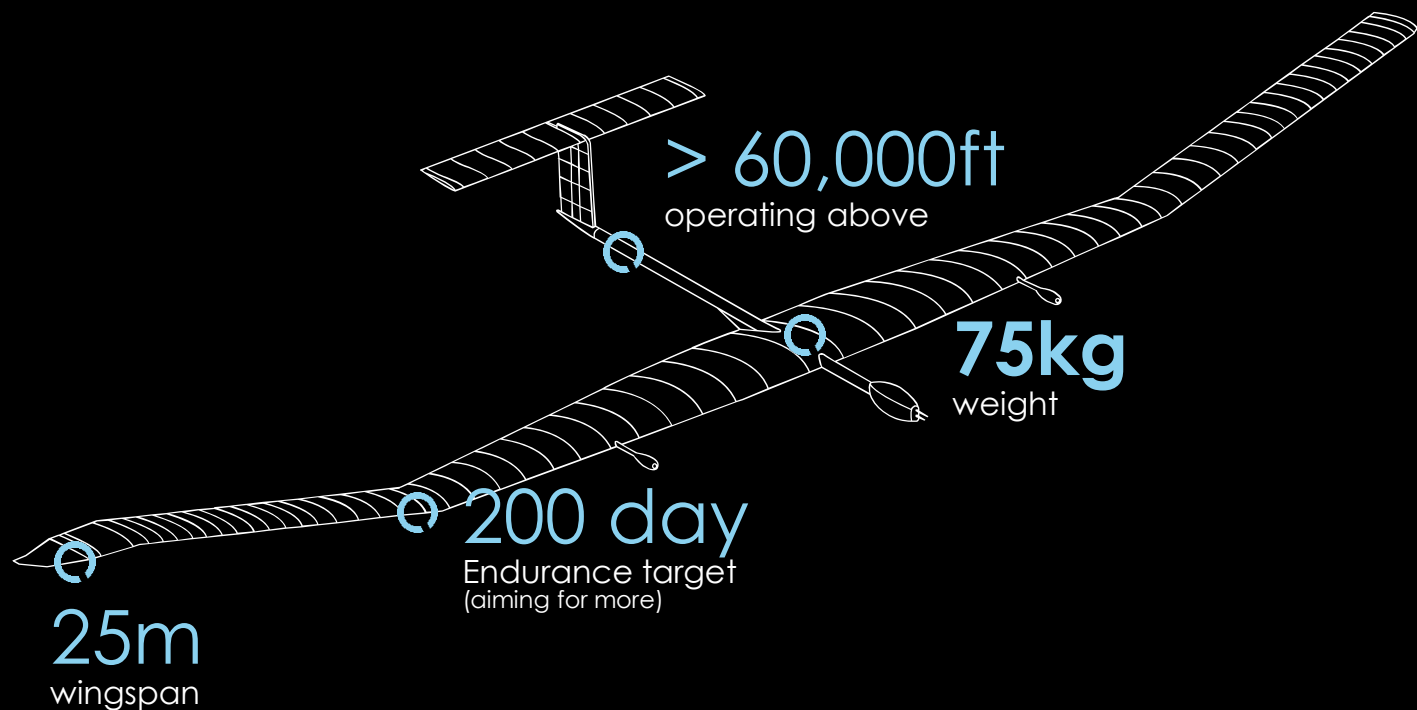
- Technology progress**
 - Lightweight materials + payload
 - Beyond Line of Sight (BLOS) control
 - Solar array
 - Met knowledge
 - Battery technology power + weight + cycles
- Certification process**

- Heavier-than-air**
 - Fixed Wing
- Lighter-than-air**
 - Balloon
 - Airship

- Mobile Connectivity**
- Earth Observation**
- Government**

Recent technological breakthroughs in other industries, such as Electric Vehicles, have had an accelerating effect on HAPS making it now technically and commercially viable for the first time

Our Zephyr HAPS Platform



100% Solar power

means Zephyr is environmentally sustainable



64 Continuous days and nights

of precise operations demonstrated in the stratosphere, during our 2022 flight campaign.



No. 1 Multiple world records

Including the longest ever unrefueled flight in the history of the Humankind.



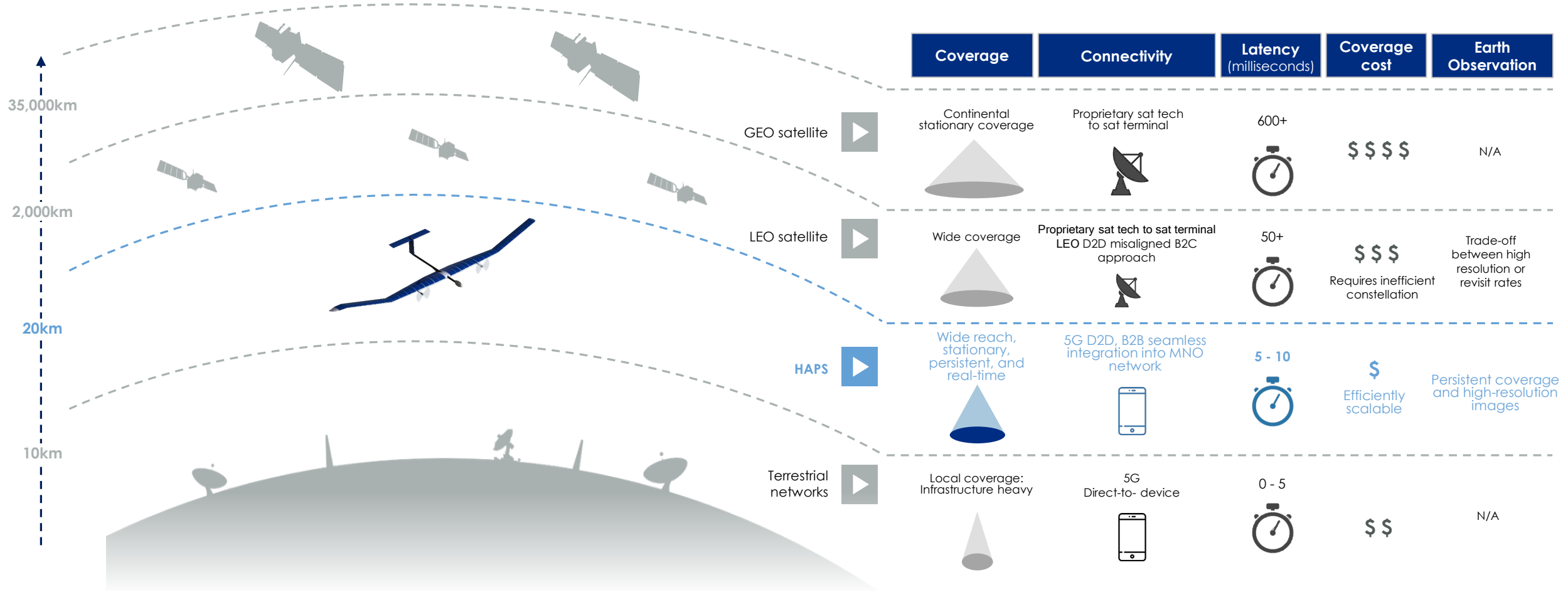
20+ Years and more

of research, design, prototyping and flying development activities.

Designed to Stay in the Stratosphere

Zephyr has unbeaten stratospheric credentials that enable it to connect new customers and their data generating new value for all in its ecosystem

Zephyr Has Unique Economic and Technical Characteristics in a Multi-Orbit Environment



Unique Characteristics Deliver Compelling Use Cases and Diverse Revenues

1 Connectivity

Bridging the digital divide for the 3.9 billion unconnected and the hundreds of millions underserved, with **4G/5G low-latency direct-to-device services**, and **IoT** and **platform mobility** solutions

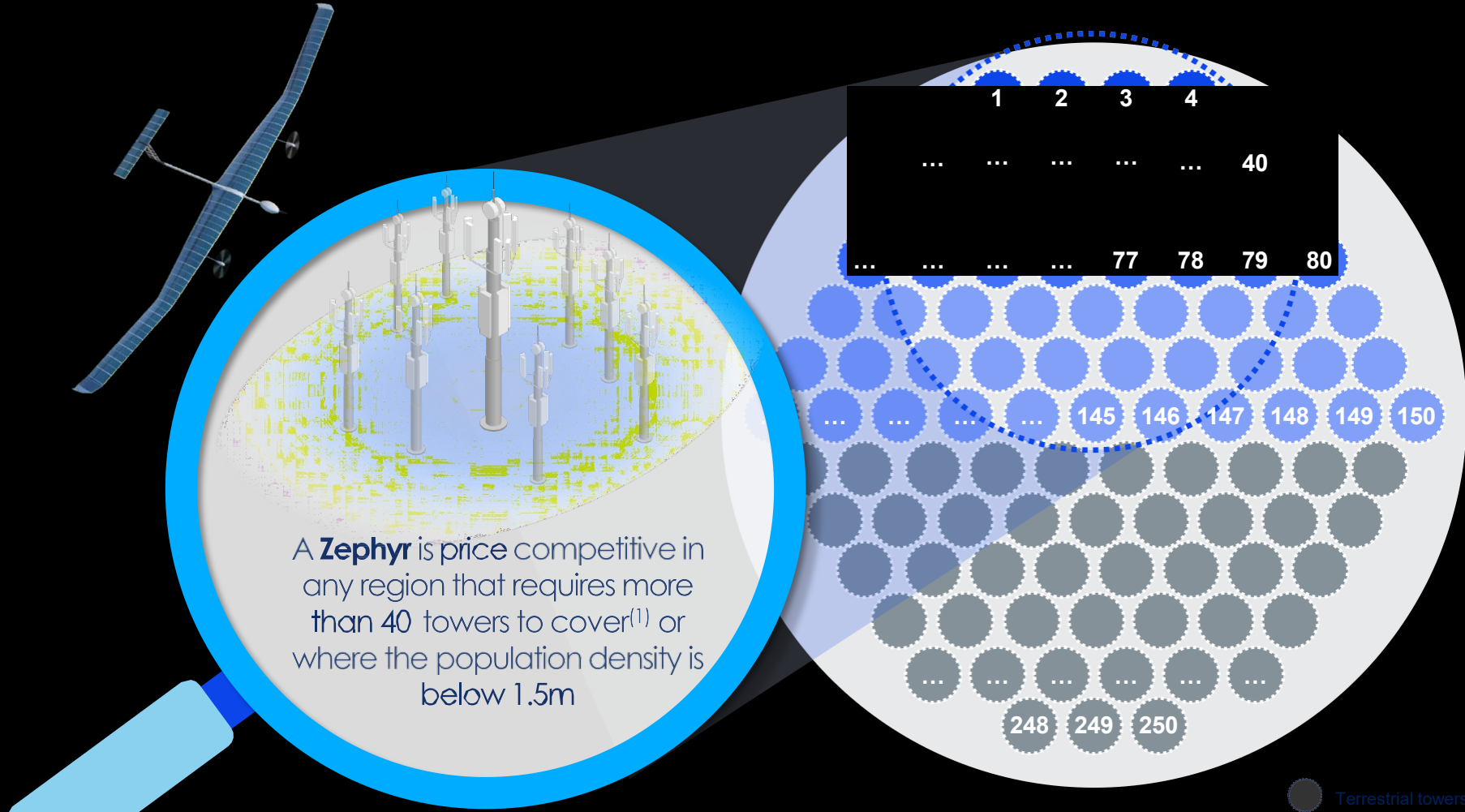
2 Earth Observation

Persistent, 24/7, high-resolution (up to 18cm GSD) images and high-quality video solutions for detection and management of forest fires, precision agriculture, increasing crop yield and food security, amongst many other applications

3 Government

Multiple payload possibilities, to support **military, federal, regional, and civil government institutions**, deliver national defense, border protection, coast guard, law enforcement, and disaster management applications

Zephyr's reach is equivalent to that of up to 250 ground towers



A **Zephyr** is price competitive in any region that requires more than 40 towers to cover⁽¹⁾ or where the population density is below 1.5m

Each Zephyr's coverage range is equivalent to

80 towers
Flat terrain: cost range \$30-100K+

150 towers
Mixed (flat and mountainous) terrain: cost range \$30-130K+

250 towers
Mountains / difficult terrain: cost range \$50-\$150K+

● Terrestrial towers

Regulatory Issues

- Departing point: The international rules for use of HAPS/HIBS have already been established (WRC23). The rules for satellite Direct-to-Device (D2D) to be discussed under WRC-27 Agenda item 1.13.
 - **Harmonized Licensing Frameworks.** Flexible and streamlined approach to HAPS, including use of self-coordinated light licensing to enable efficient coexistence between incumbent ground-based fixed service and HAPS.
 - **Fees.** HIBS will be part of the MNOs networks, so no additional fee should be required - MNOs have already paid the license fee for the ground base station.
 - **Use of Mobile Service licenses. Allowing** MNOs to use their service licenses to provide services via HIBS, which will facilitate the rapid deployment of IMT systems into rural and remote areas that currently lack connectivity.
 - **Streamlined Customs and Type Approvals.** Adoption of import pre-approvals and streamlined customs clearance, especially for equipment that may be used for disaster communications. . Accept Supplier's Declaration of Conformity (SDOC) to clear TA requirements.
 - **Flexible Service Definitions to Support Innovation.** Regulators should take a flexible view toward HAPS definitions and mobile network regulations to cover stratospheric operations.
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