



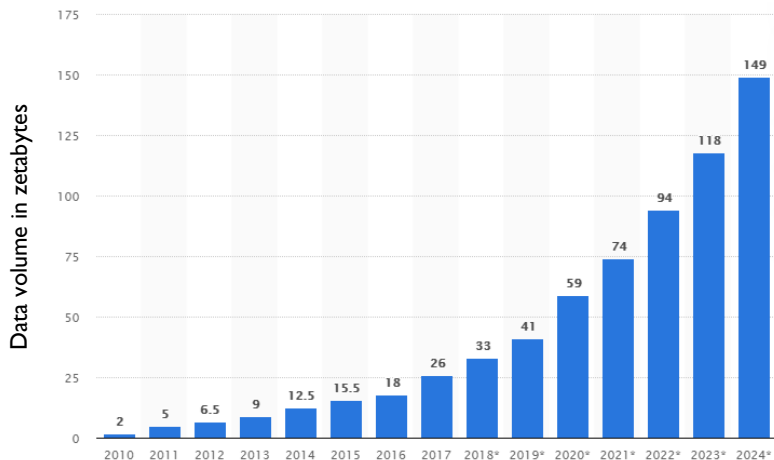
# Free Space Optics (FSO) and the 5G Journey

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# Society is evolving faster than our infrastructure

## Data generation is accelerating



Source: Statista 2021

As data volumes increase, we need technology which will be able to **handle the volume**

As our work and lives shift, we need flexible infrastructure which is **upgradeable and dynamic**

As quantum computing and cyber threats arise, we need **secure connections**

As we travel further afield, we need to communicate **across domains and vast distances**

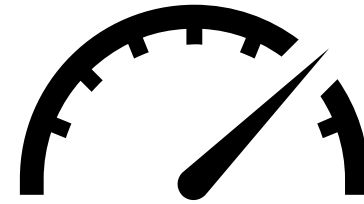


**Free Space Optics (FSO)**, a subset of **Optical Wireless Communications (OWC)**, refers to the point-to-point movement of data between optical terminals

# FSO BENEFITS



Access to spectrum



Data rate



Security



Interference

# FSO DATA RATES



1-10Gbps



30-50 Gbps



100 Gbps



500 Gbps



Tbps

# FSO CHALLENGES

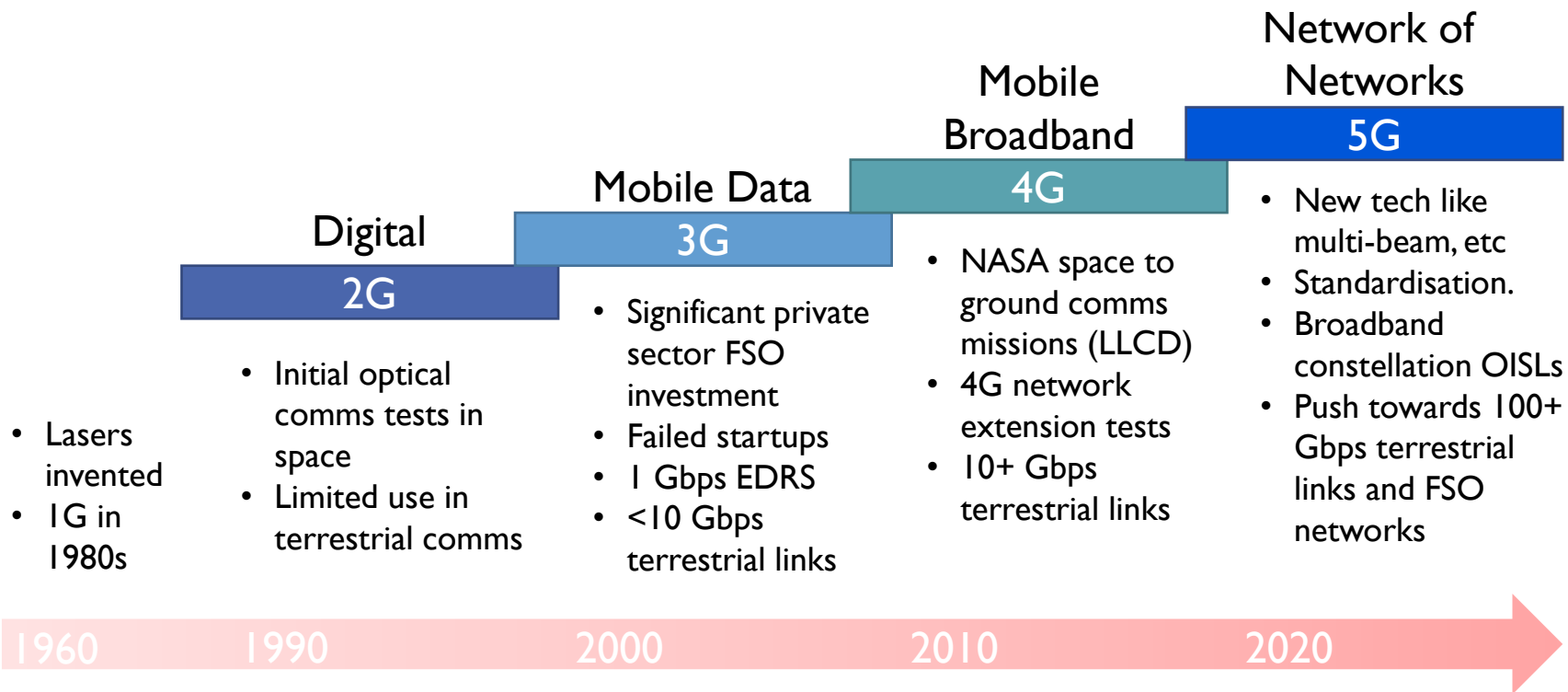


IMAGE: <https://www.nasdaq.com/Nasdaq-cloud-data-api>



IMAGE: <https://www.mentalfloss.com/article/57555/11-incredible-photos-cities-shrouded-fog>

# HIGH LEVEL FSO EVOLUTION OVER TIME



INSPIRED BY: <https://www.intelsat.com/wp-content/uploads/2020/03/intelsat-mobile-world-live-5G-whitepaper.pdf>

# SETTING THE STANDARD FOR OPTICAL COMMUNICATIONS

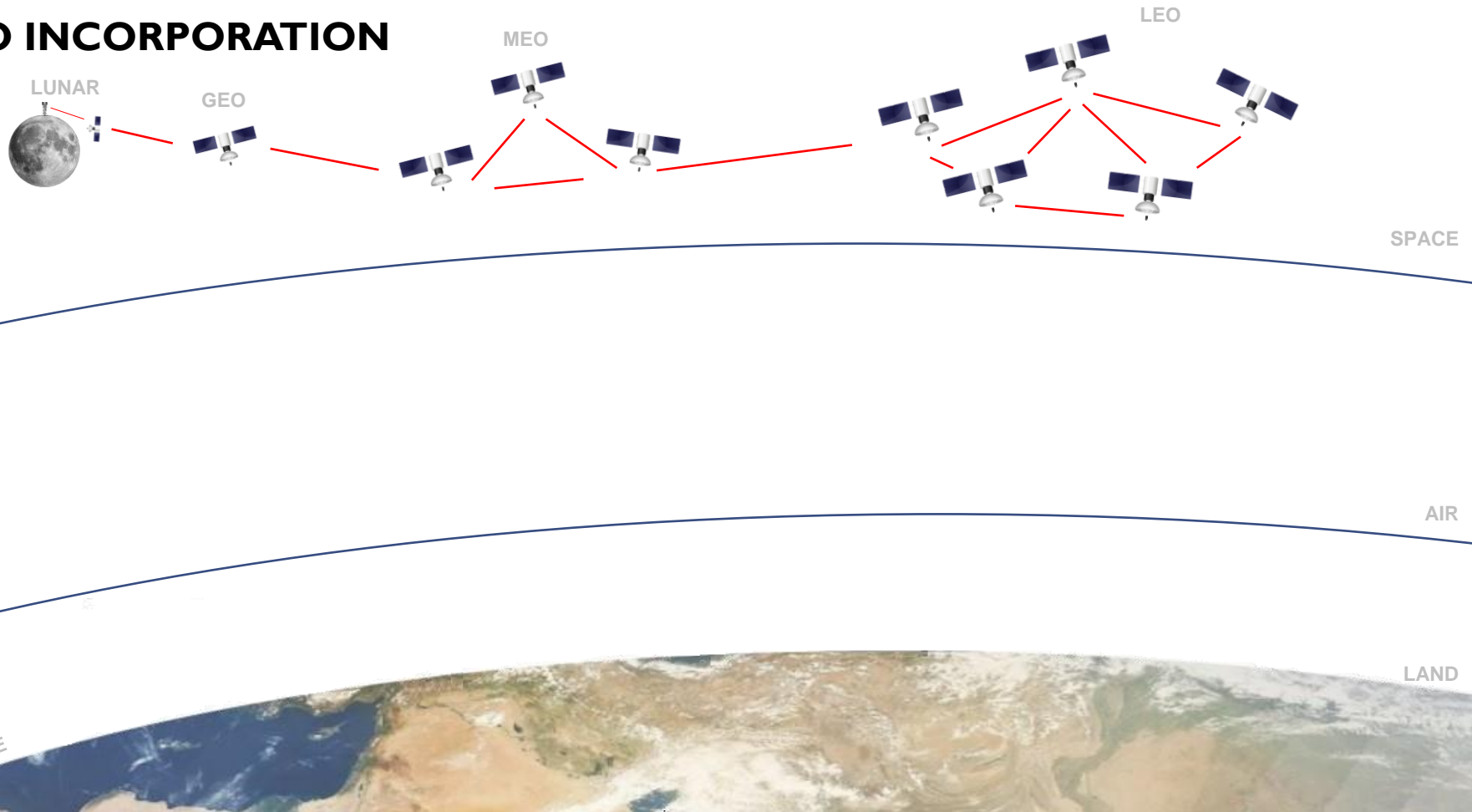


IMAGE: <https://www.sda.mil/>

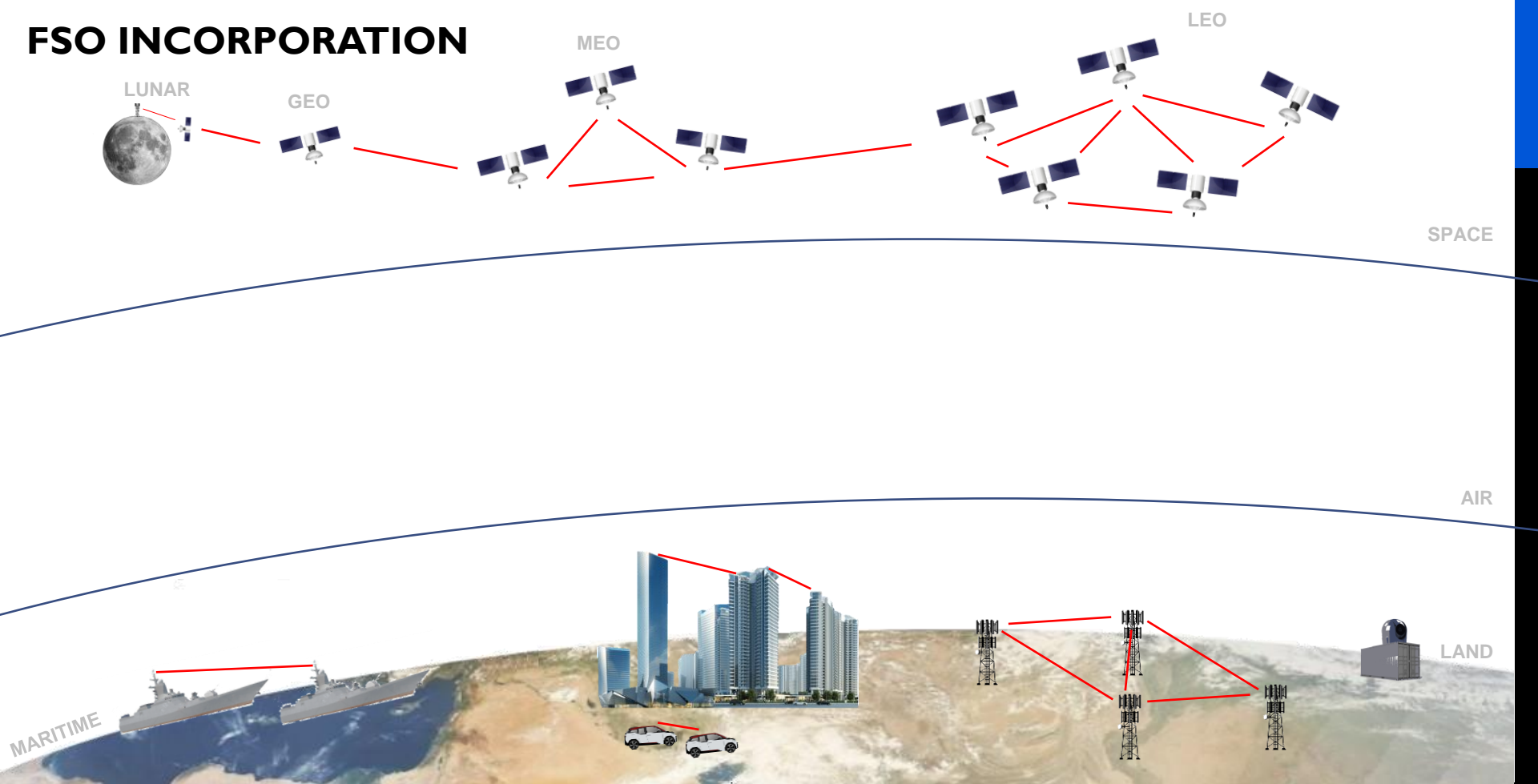




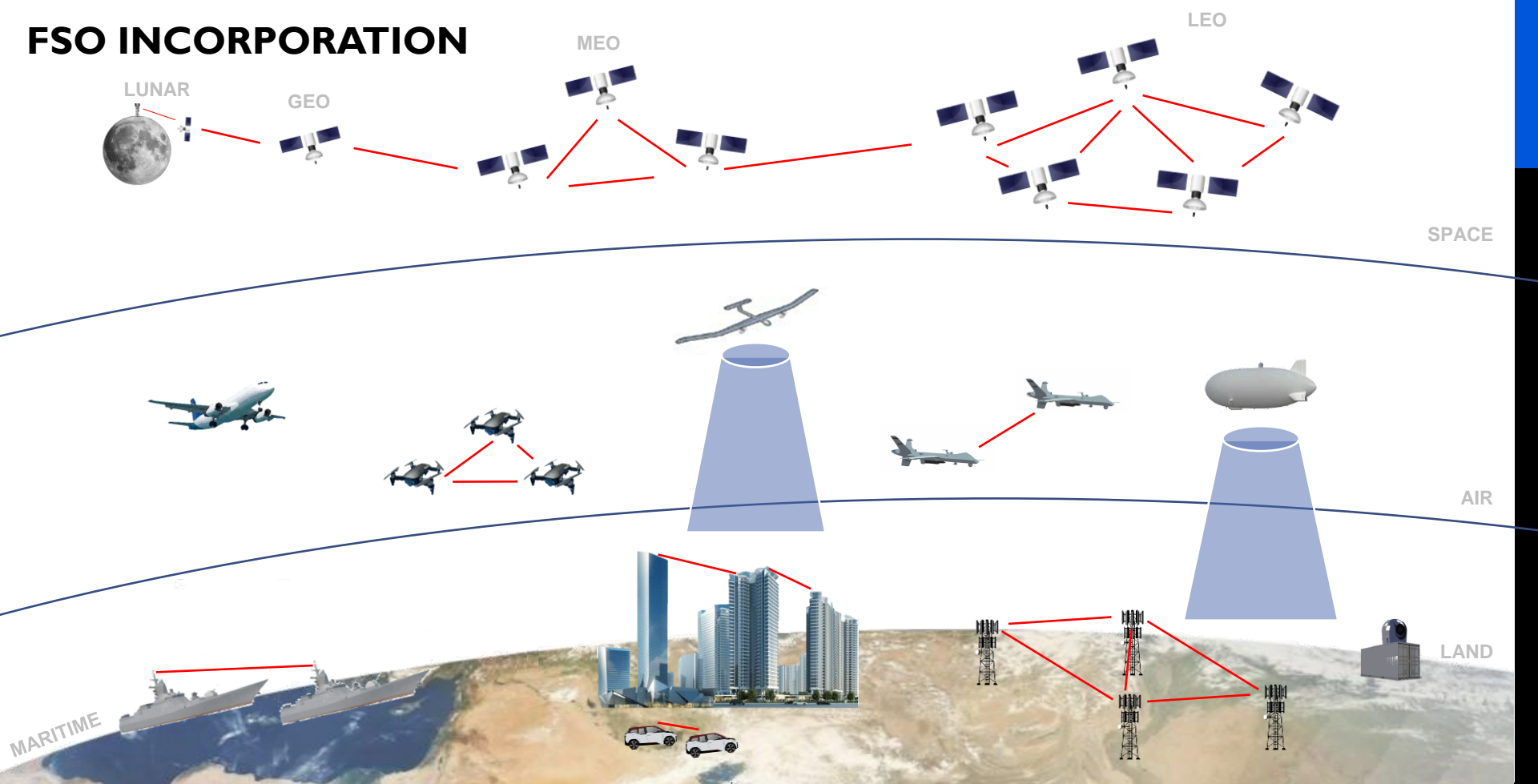
# FSO INCORPORATION



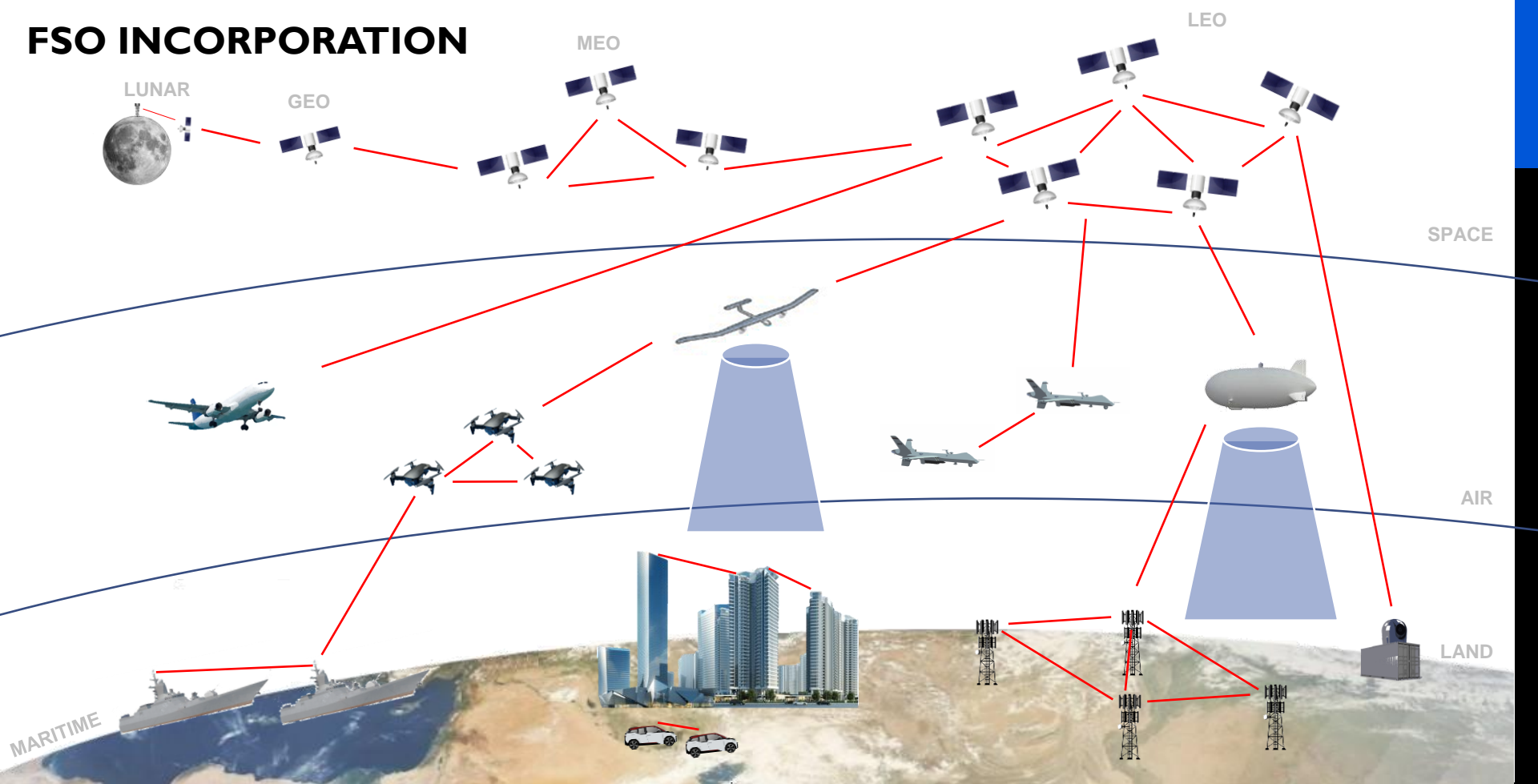
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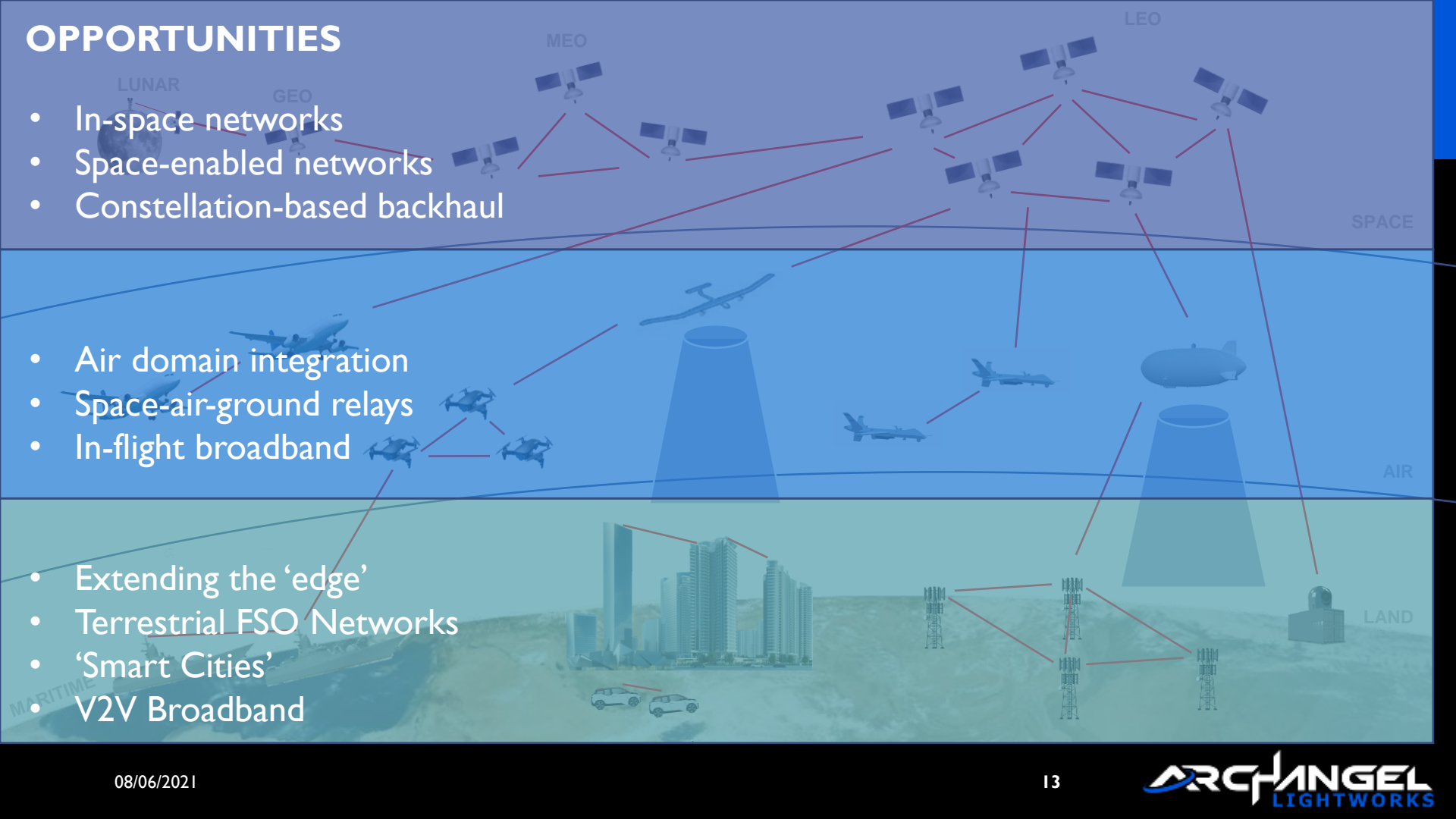


# OPPORTUNITIES

- In-space networks
- Space-enabled networks
- Constellation-based backhaul

- Air domain integration
- Space-air-ground relays
- In-flight broadband

- Extending the 'edge'
- Terrestrial FSO Networks
- 'Smart Cities'
- V2V Broadband



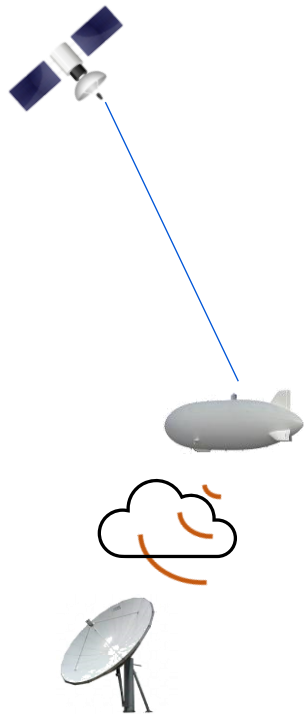
# Our initial laser hardware connects space, air and ground



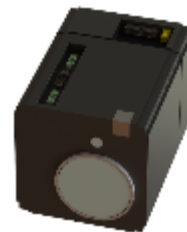
We prime the European Space Agency's High-Altitude Laser to/from Orbit (HALO) program

Our deployable airborne infrastructure bypasses cloud, using radio and laser comms to maximum benefit

- ✓ 100x more data vs radio
- ✓ Greater security
- ✓ Lower cost per Gb
- ✓ Less power per Gb
- ✓ No licensing delay



We are building a **space laser terminal** for small satellites...



And a **deployable laser terminal** for mobile platforms



# Thank you. Questions?

We are always looking for new partners. Reach out to us here:

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<https://www.archangel.works>

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