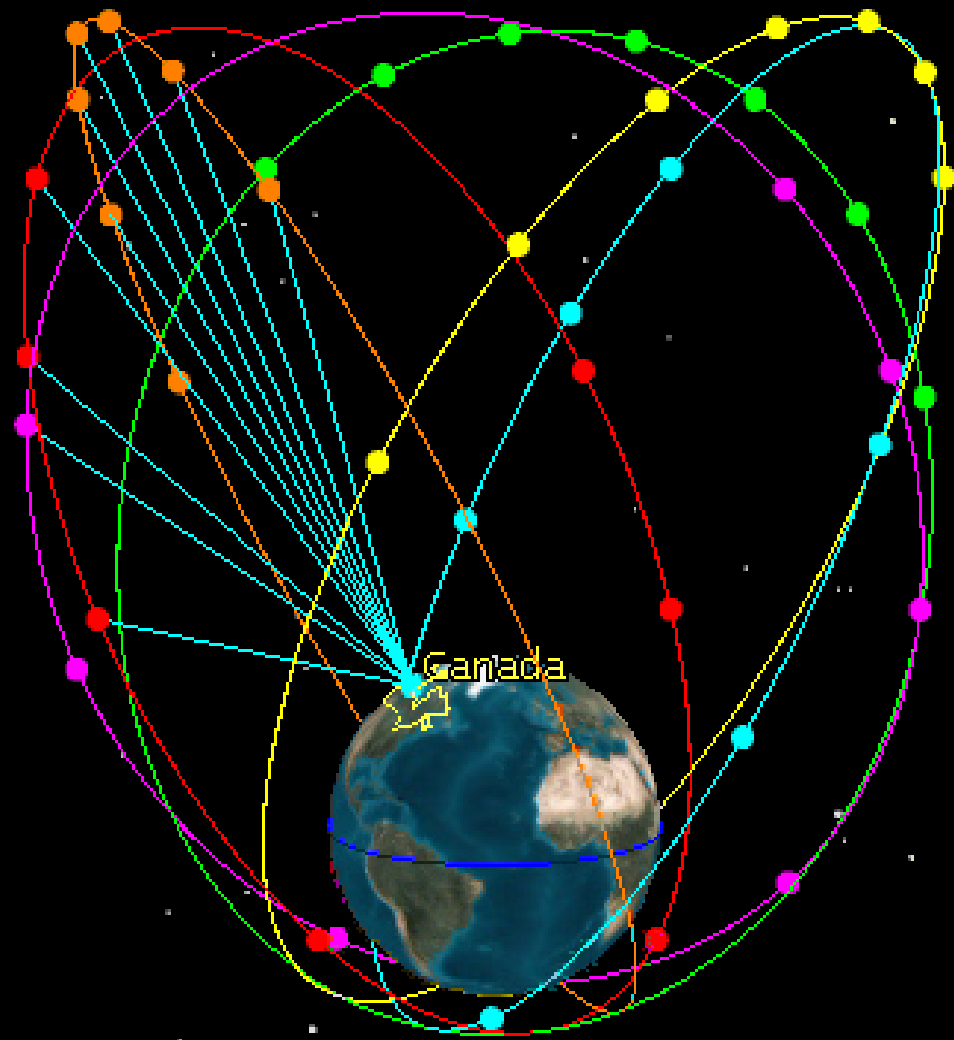
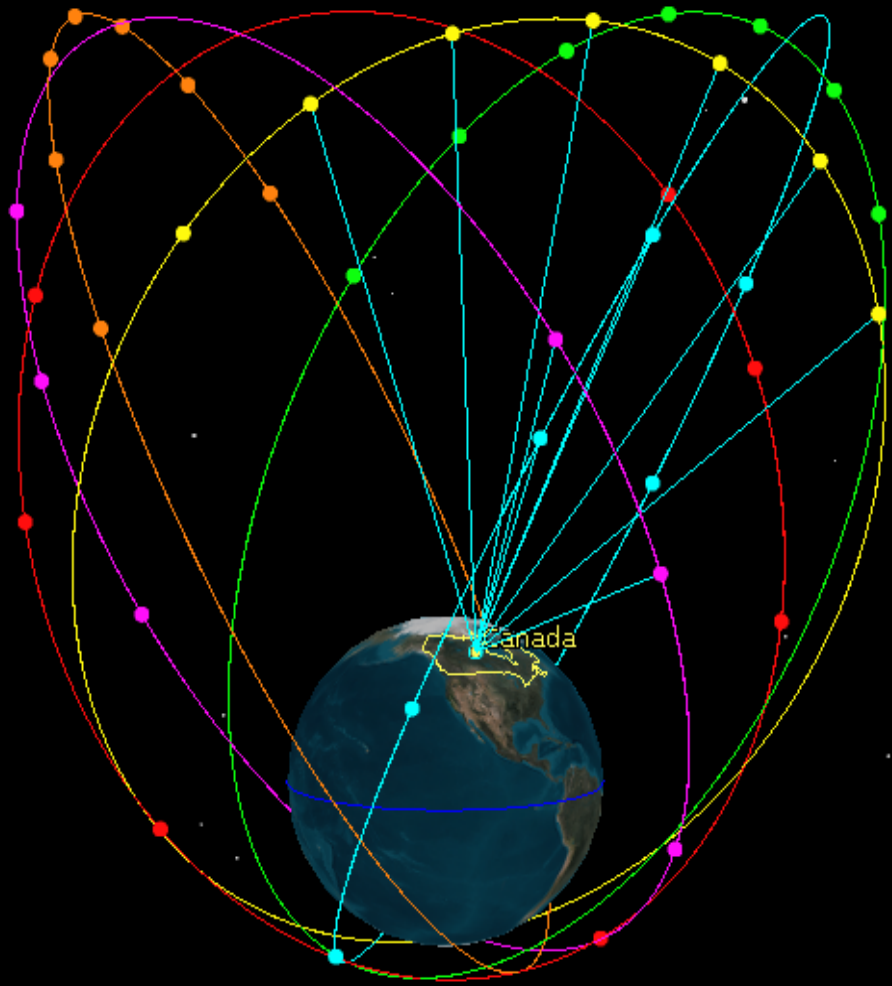


ITU Small Satellite Panel
May 30th 2017

**Do New Constellations
Have to Cost Billions?**







Clarke Belt 2.0TM

*IP Connectivity for Everyone,
Everything, EverywhereTM*

Focusing Capacity/Coverage to Customers

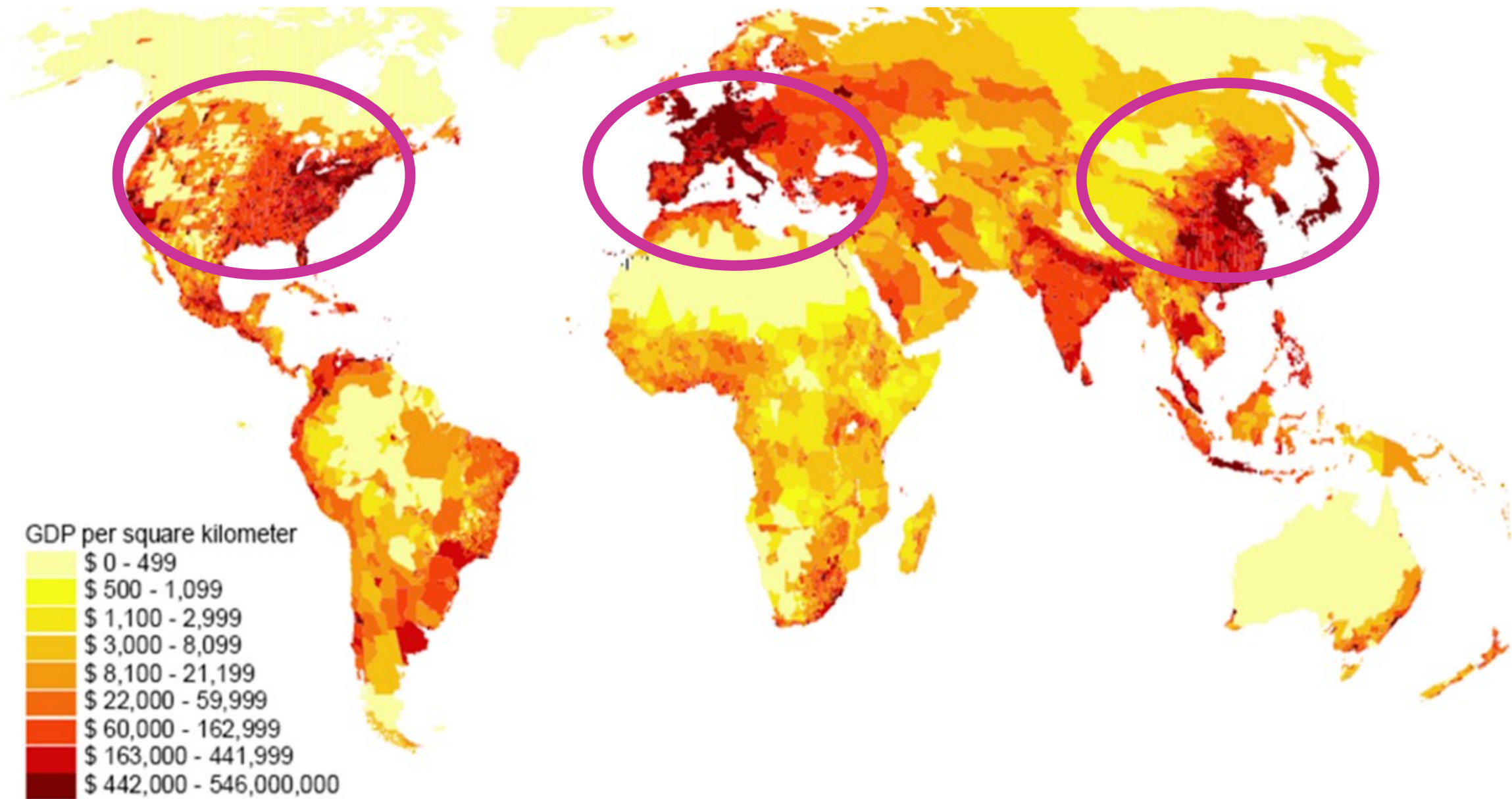
71% of the earth/globe is covered by water & ice

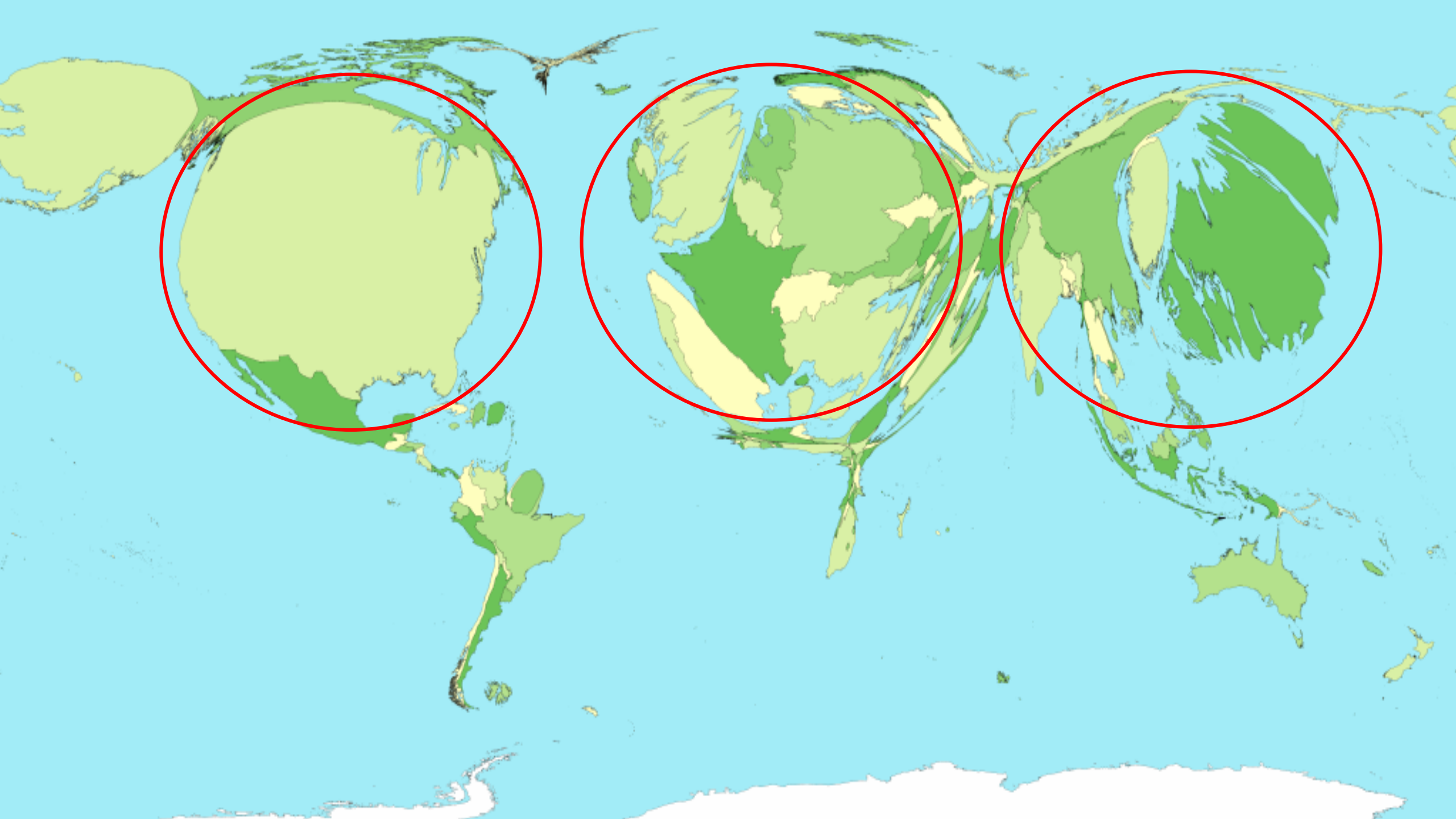
46% of landmass holds <2% of world population

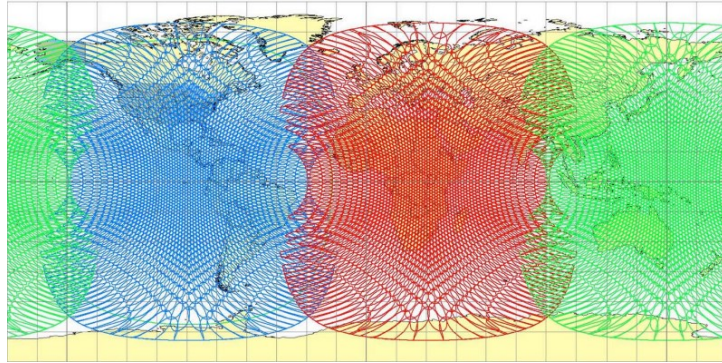
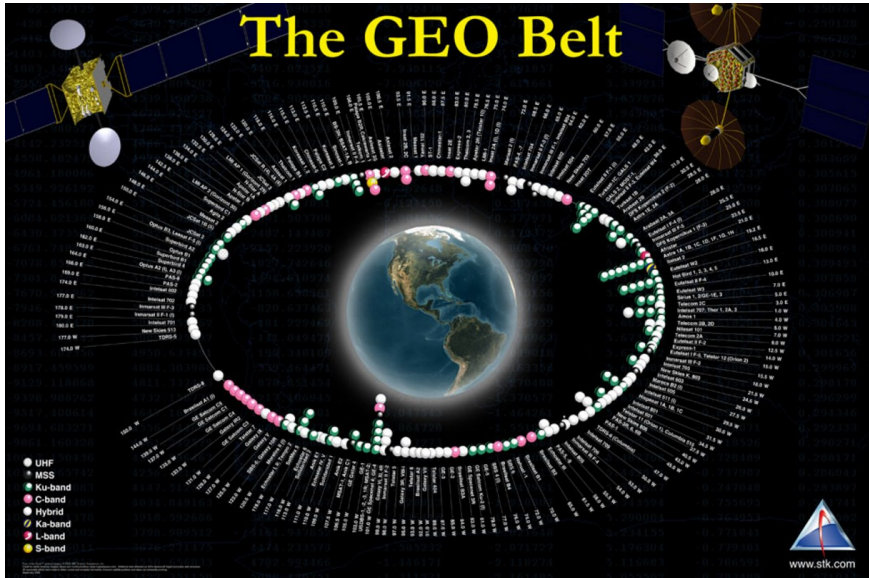
>98% of the people are located in <13% of world

95% live on <5% of world's surface

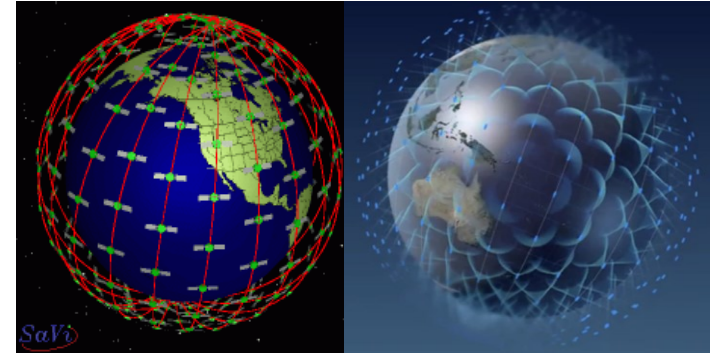








ViaSat-3 HTS footprints



Polar Orbit LEO

OneWeb



Regional satellite operators & VARs are being left behind with no spectrum to grow/compete

Geo belt overcrowded – limited future growth

Industry focus on High Throughput Satellites and multi-\$Billion LEO Constellations

But there is an industry solution...

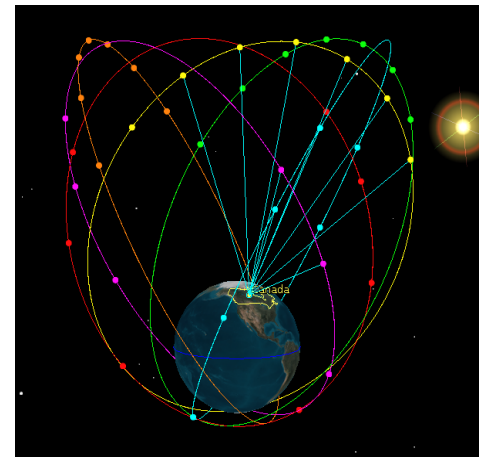
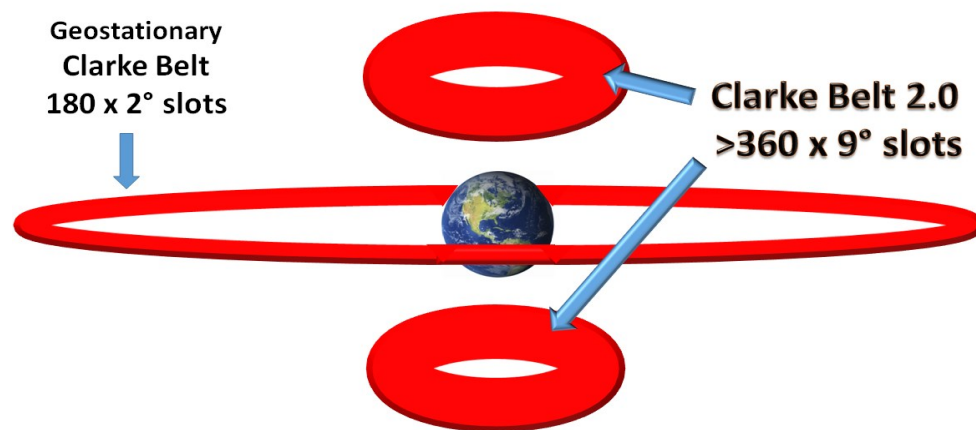
CB2.0 Inclined Elliptical Orbits



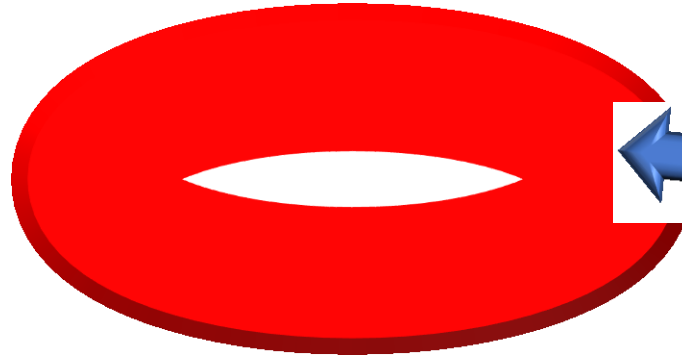
Clarke Belt 2.0 Replicates Entire GEO Arc

GEO arc congested/full – needs new slots to grow:

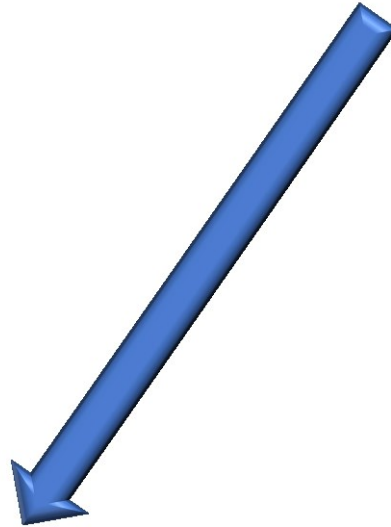
- Elliptical orbits (HEO) used to create two new geostationary-like orbit arcs – each capable of delivering more than current GEO-arc
- HEO orbits are complementary to GEO satellites and 5G/Mobile Wireless services – can share spectrum & provide growth vehicle
- HEO provides superior technical and economic benefits when compared to GEO High-Throughput or LEO satellite programs

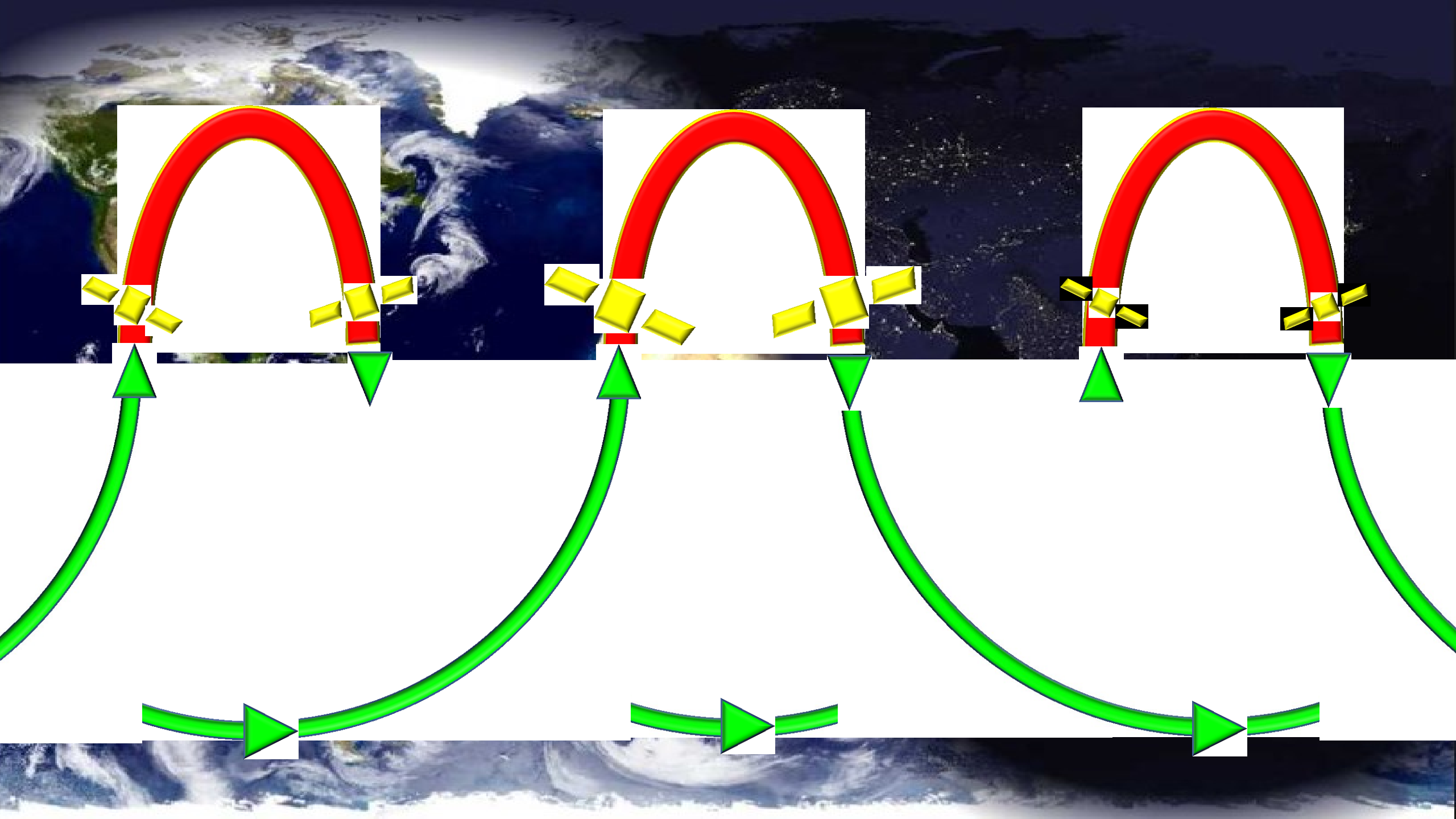


**Geostationary
Clarke Belt
180 x 2° slots**



**Clarke Belt 2.0
>360 x 9° slots**



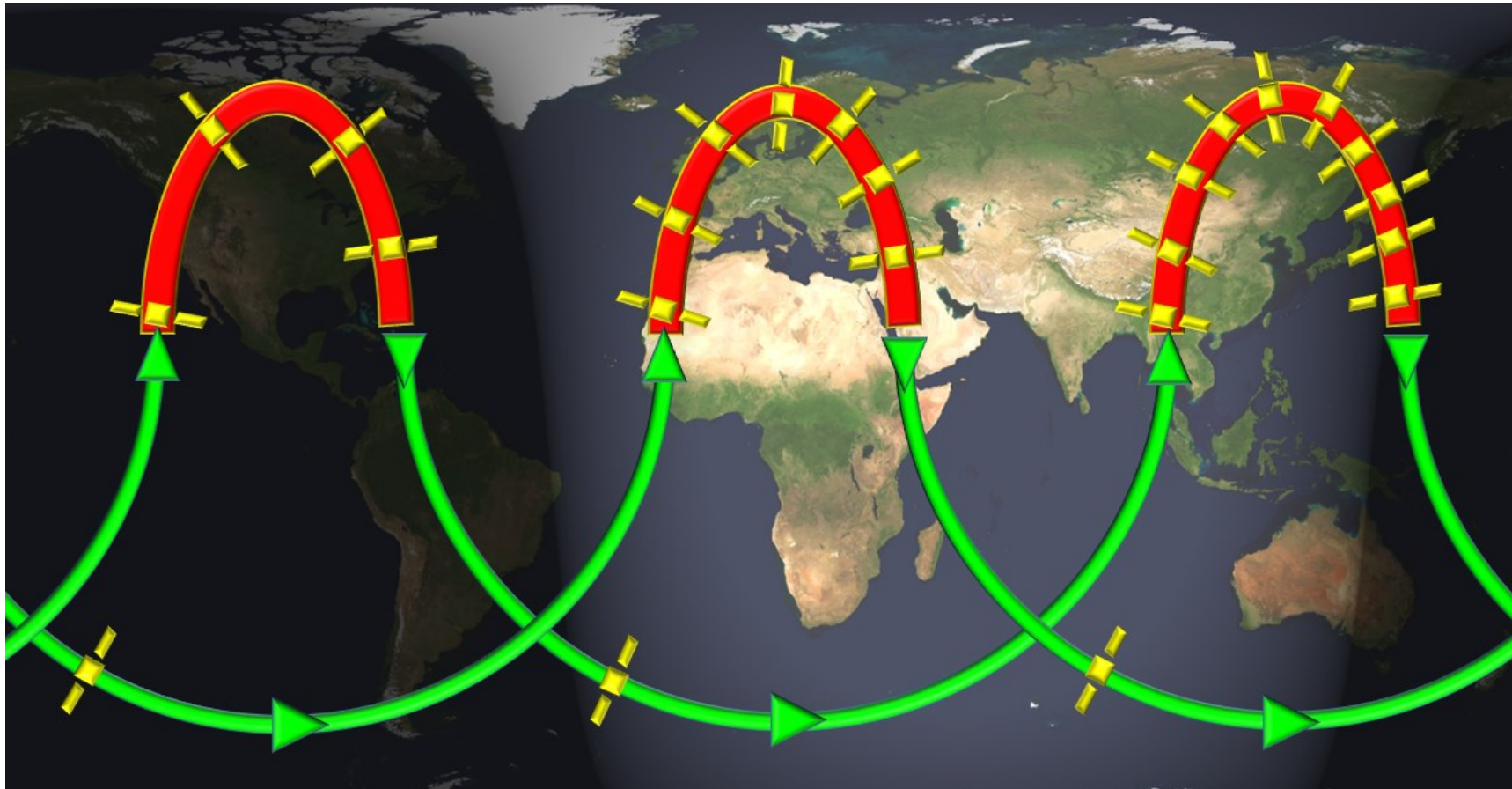


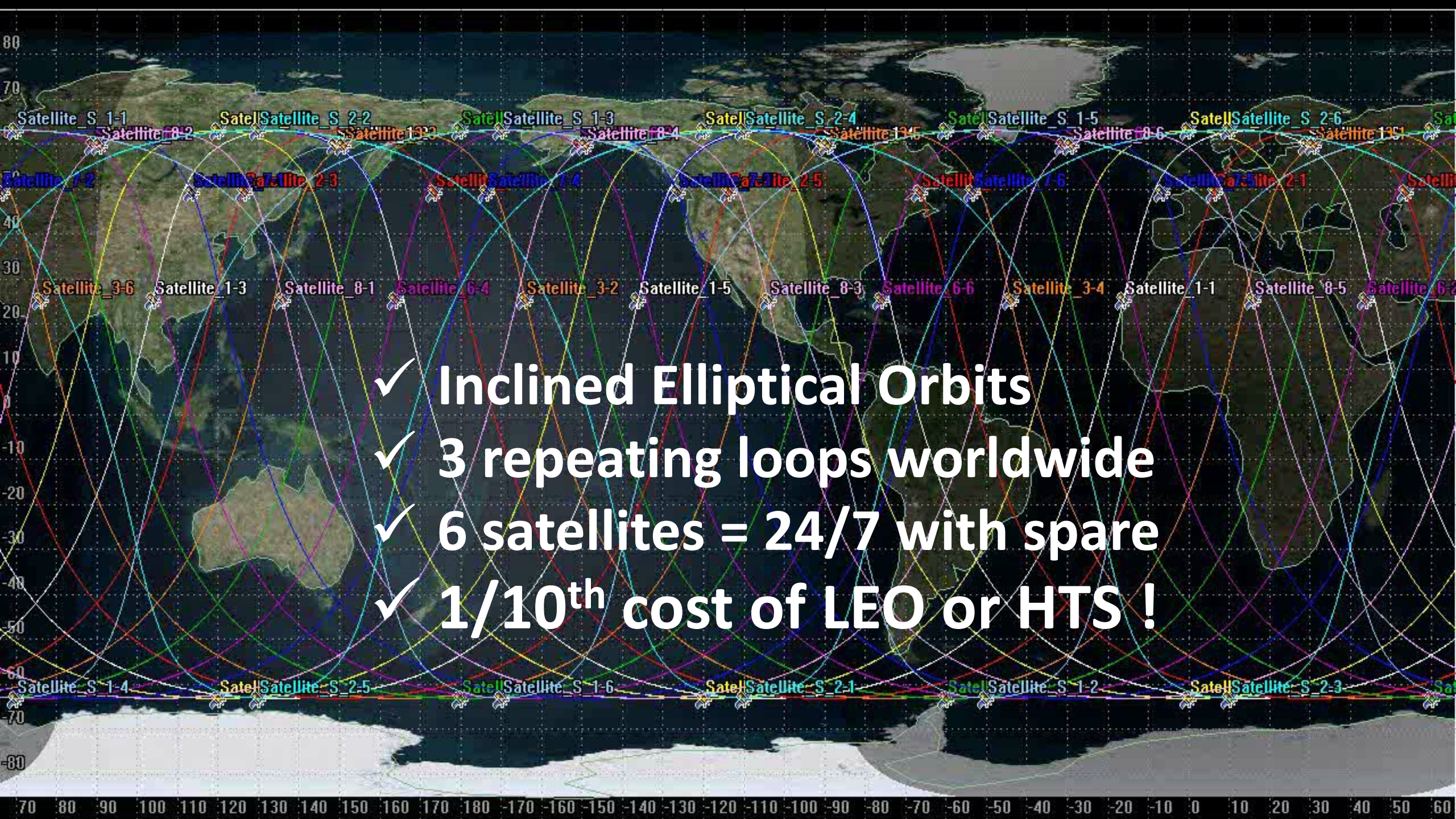
Initial Service for Northern Hemisphere

Baseline constellation: >100 Gbps peak serving 3 continents

24 smallsats cost less than single GEO – service launch before 2020

Able to be replicated in any Satcom band – tracks shifted E/W or N/S





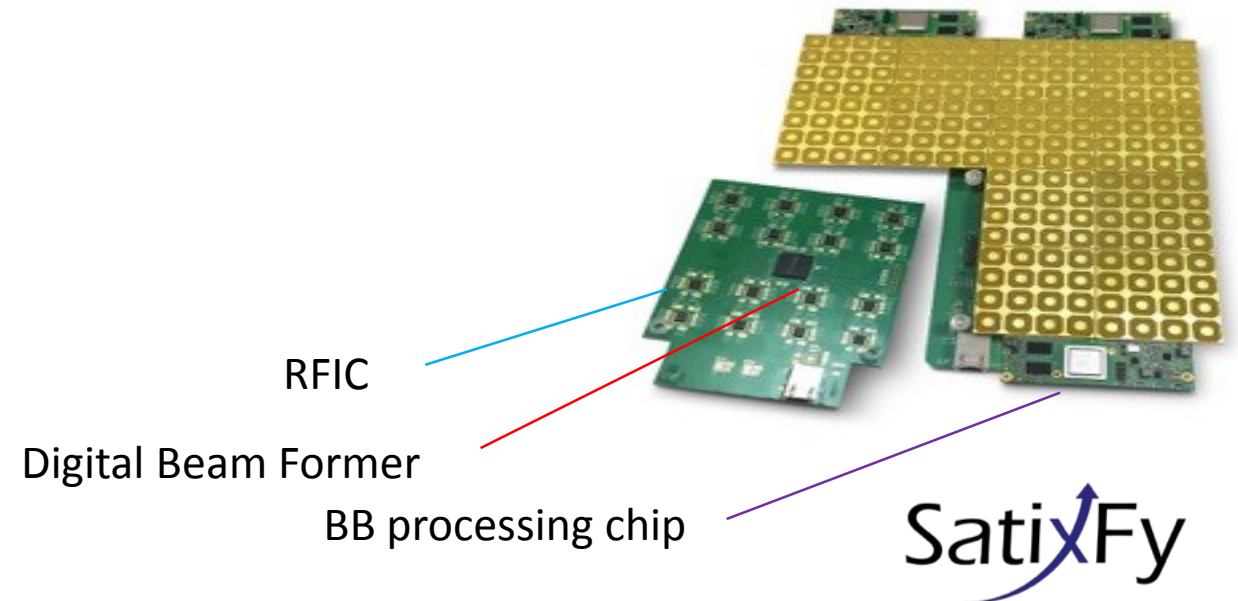
- ✓ Inclined Elliptical Orbits
- ✓ 3 repeating loops worldwide
- ✓ 6 satellites = 24/7 with spare
- ✓ 1/10th cost of LEO or HTS !

CB2.0 Advantages

- ✓ **Complementary to GEOs and Terrestrial (>20° angular separation) by architecture / design**
- ✓ **Will use ephemeris data for avoidance for MEO and LEO interference**
- ✓ **Superior technical characteristics/performance Beam Hopping for MEO and LEO constellations.**
- ✓ **Use switching between Multiple satellites, carriers, frequencies and or any combination of the above.**
- ✓ **Highest throughput/efficiency / High look angles / over top GDP nations**
- ✓ **Ability to add scalable investments / incremental capacity to match demand and Time of Day specifics**

How do we reduce price per bit/sec by 10x?

- **Multi-Satellite Beam Hopping**
- **On-Board-Processing (separate user, gateway, IS Links)**
- **Software Defined Radio Baseband Chips (500 MHz DVB S2X)**
- **Electronically Steered Phased Array Antenna**
- **Digital Beam-Forming**
- **Multi-Beam capability**



Beam Hopping

- **Unlike Beam Switching – Beam Hopping targets IP traffic to users where they are**
- **Offers flexibility in time and space**
- **Shown to provide:**
 - Adaptability to demand distribution
 - Advantages in power consumption
- **SatixFy's SX-3000 family**
 - Has a powerful acquisition engine for burst reception
 - Supports DVB-S2X Annex E waveforms for beam hopping
- **SatixFy initiated a standard to enable multi-vendor operations of beam-hopping**
- **Multi-Satellite, Multi-Frequency, Multi-Beam Hopping**

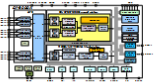
SX-3000B

- First chip by SatixFy
- SNR of -30 to +30db
- Software Defined Radio
 - Fully compliant with DVB S2X and DVB RCS2
- 500 MHz wideband HTS transponder support -3 Gbps!
- Modem Mod and Demod
 - 4 channels - Rx,
 - 1 Channel - Tx
- Beam Hopping
- Very low SNR reception (small antennas)



SX-3099

- Multi modem on a chip. Multi Beam Former interface
- Low Cost
- Low power – battery/Solar operation
- Fixed or mobile use cases
- 500 MHz Demodulator
- S2X /RCS 2 Modulator
- Full Software Compatibility to SX 3000B



Old Space vs New Clarke Belt 2.0 Space

Who Benefits?

- Regional Operators
- VARs
- 180 Countries
- Startups
- Military Budgets
- Redundancy/Diversity
- Academic
- USO (Universal Service)

Investors and Shareholders
Growth path for 50+ years
Easy on Ramp for new concepts
Focus Developers on monetization
IoT/Internet 3.0
Smaller Antennas (10 cm x 10 cm)
Orbiting Cellphones
Lowers costs for Users

Synergistic and/or Competitive with Mobile Operators !!



Summary

- **100+ Gbps hemispheric service for less cost than one GEO**
- **Seeking Regional fleet operator & reseller partners to develop low-risk scalable beachfront spectrum opportunities**
- **Solving global connectivity/capacity shortages; solutions for franchisees serving highest GDP/ROI regions**
- **Low-risk high-ROI franchise go-to-market plan targets satellite operators & vertical VARs with unmatched price/services**

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