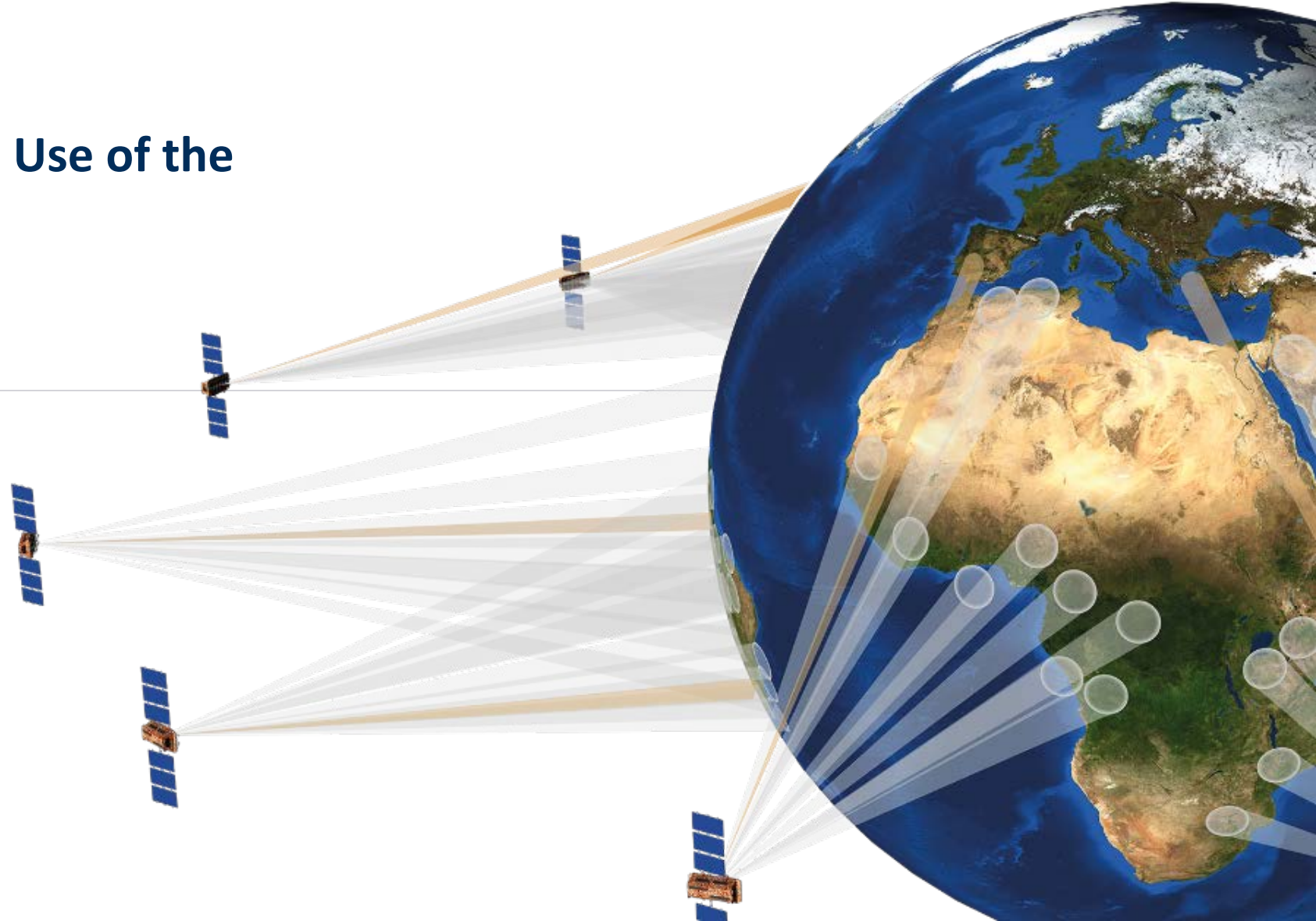


Non-GSO Satellite Issues

ITU Workshop on the Efficient Use of the Orbit/Spectrum Resource

Bali, Indonesia 6 Sept. 2016

Anthony Baker, O3b



AGENDA

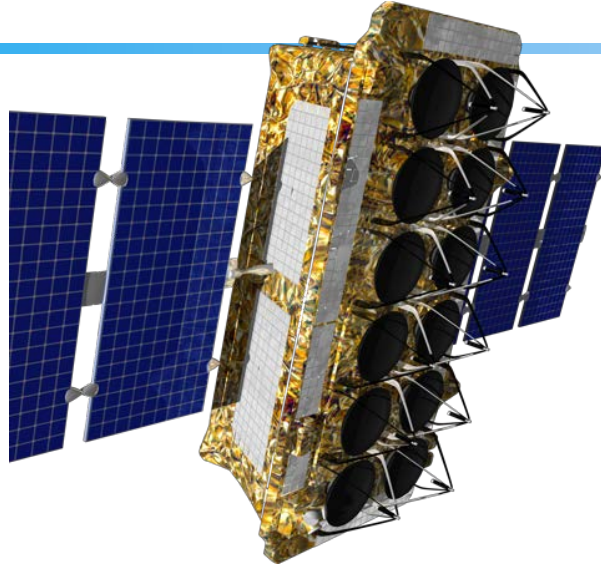
1. O3b – one year on
2. NGSO-NGSO/GSO coordination
3. Bringing into use

One Year On - Customers worldwide



- LIVE Customers
- Customers preparing for Service Launch

O3b Capability



MEO: 8,062km (5,010 miles) altitude

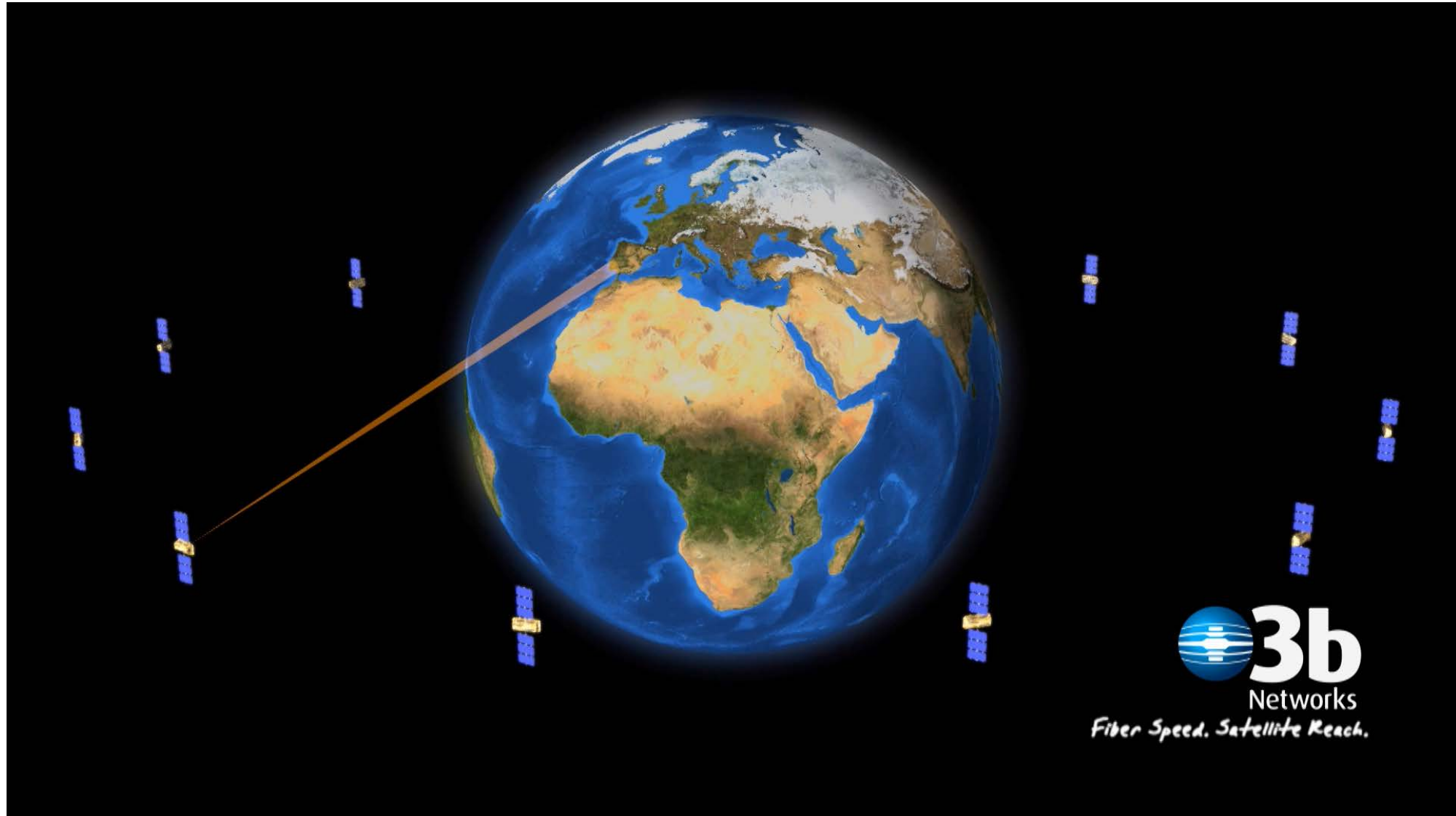


12 satellites today	12 steerable beams / satellite
8 more satellites	Clones of existing fleet to be launched by 2018
High Throughput	Up to 1.6 Gbps per beam
Low Latency	Roundtrip latency of less than 150msec enabling: <ul style="list-style-type: none">– Crystal clear voice and video quality– Ultra-fast response time– Use of cloud-based applications– Access to ISR applications (High Definition Full Motion Video & Secure Cloud access)– Exceeds 4G LTE standards of latency, able to run Advanced LTE systems
Low Cost	Up to 30% more affordable
Flexibility	Steerable beams can be placed anywhere 62 degrees North/South of the Equator
Scalability	From 100 Mbps up to 1.6 Gbps

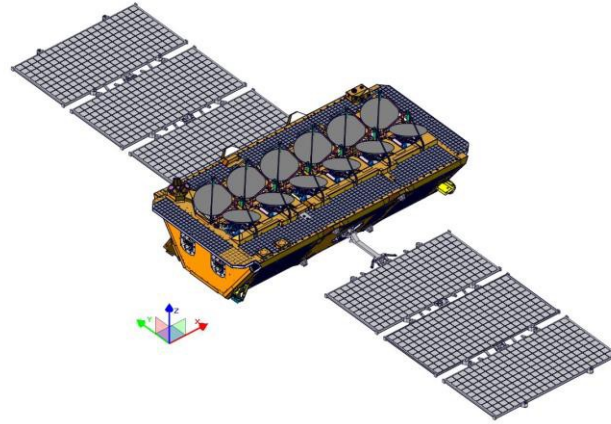
Fiber Speed, Satellite Reach!

An Alternative Approach

Fiber without the Cable



O3b Satellites - Pictures



- 
- 8 additional satellites – ***Coming 2017-2018***
 - More capacity
 - Larger coverage
 - Efficiencies of scale

In support of future data demand

O3b Plans Today and Tomorrow

Enabling 3G and 4G Mobile Broadband – Through O3bTrunk



Fiber Speed. Satellite Reach.

“We are very pleased to have gone live on the O3b network, which will allow us to launch 3G services imminently”

Palau National Communications Company



“Our corporate customers demand high levels of performance and resilience and our unique hybrid network will differentiate our service, particularly for our corporate and enterprise customers.”

Gulfsat / blueline

Network upgrades

The image shows a vertical stack of four promotional banners:

- Top banner:** "3G NOW AVAILABLE" with a "3G" logo in a red box. Below it, a row of six colored boxes (purple, yellow, blue, orange, green, pink) each containing "3G". Underneath, it says "AVAILABLE NOW IN RAROTONGA".
- Second banner:** "Broadband Plans just got BETTER AGAIN!" with a "From Effective 1st March 2014" note. It lists several plans: "Intro 1.5 ca \$25", "Standard 3.5 ca \$49", "Value 8 ca \$89", "Plus 15 ca \$139", "Super 32 ca \$299", and "Mega 75 ca \$699".
- Third banner:** "Digicel 4G" logo with a red arrow pointing to the right.
- Fourth banner:** "4G BUSINESS" with a blue "4G" logo on a white background.
- Fifth banner:** "PROMO 4G Lte" with "Passez à la vitesse supérieure!" and "1^{er} Réseau 4G Lte à Madagascar".

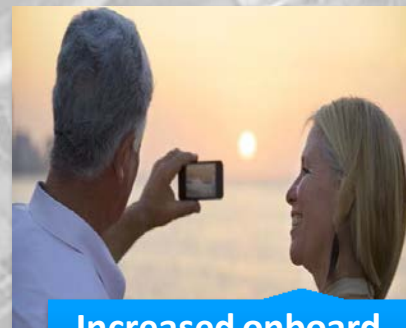
Royal Caribbean and O3b are changing an entire industry

The 1st ship had more bandwidth than the rest global cruise industry combined

Expansion of the RCCL fleet in the Caribbean, Europe and Asia



Reaching New Customer Segments



Increased onboard revenue



Increased customer satisfaction



Increased employee satisfaction

3. O3b Plans Today and Tomorrow

O3b Terminal Range- All operational

7.3 meter



4.5 meter



2.4 meter



1.8 meter

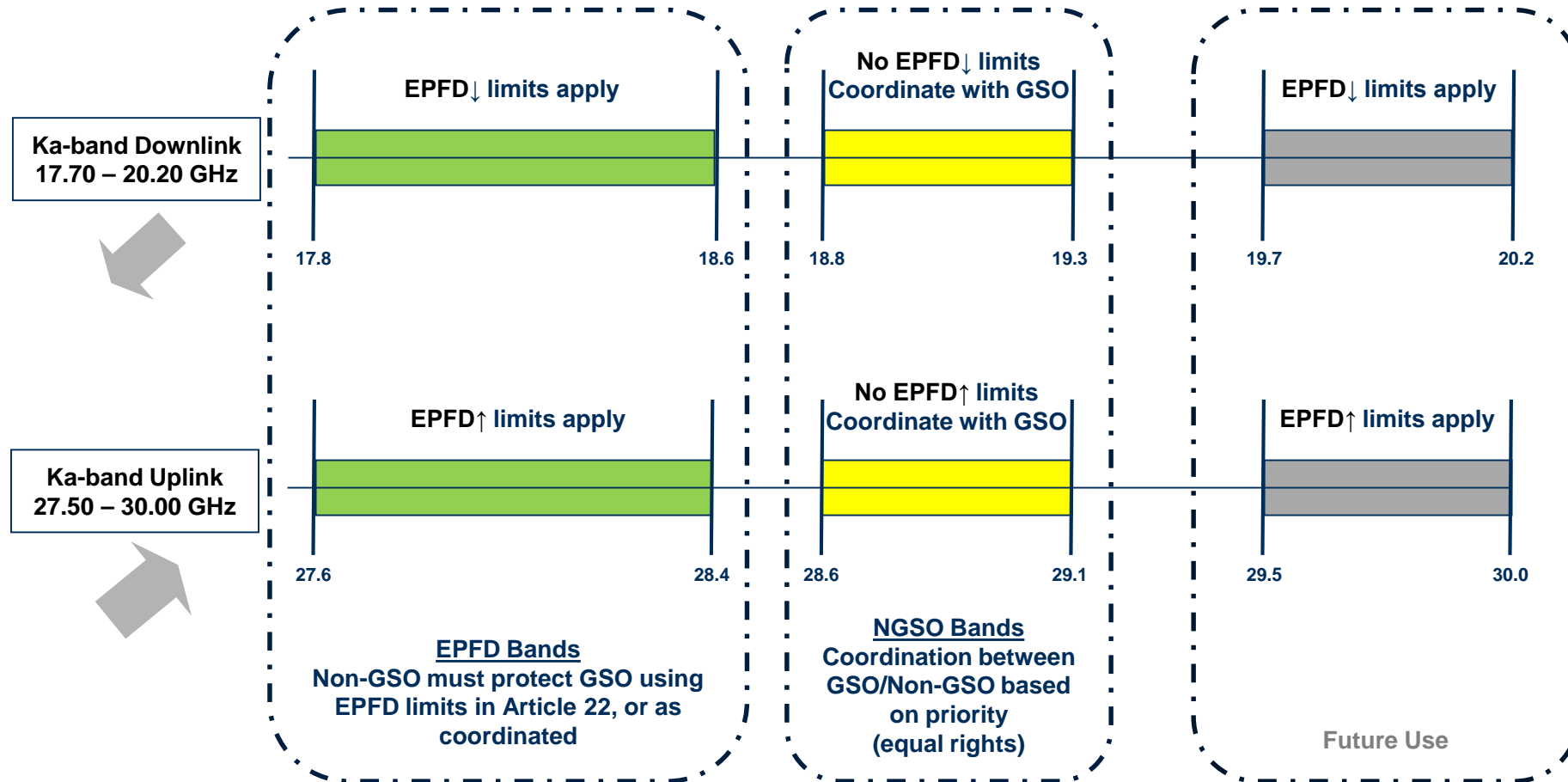


1.2 meter or 2.2 meter
Stabilized

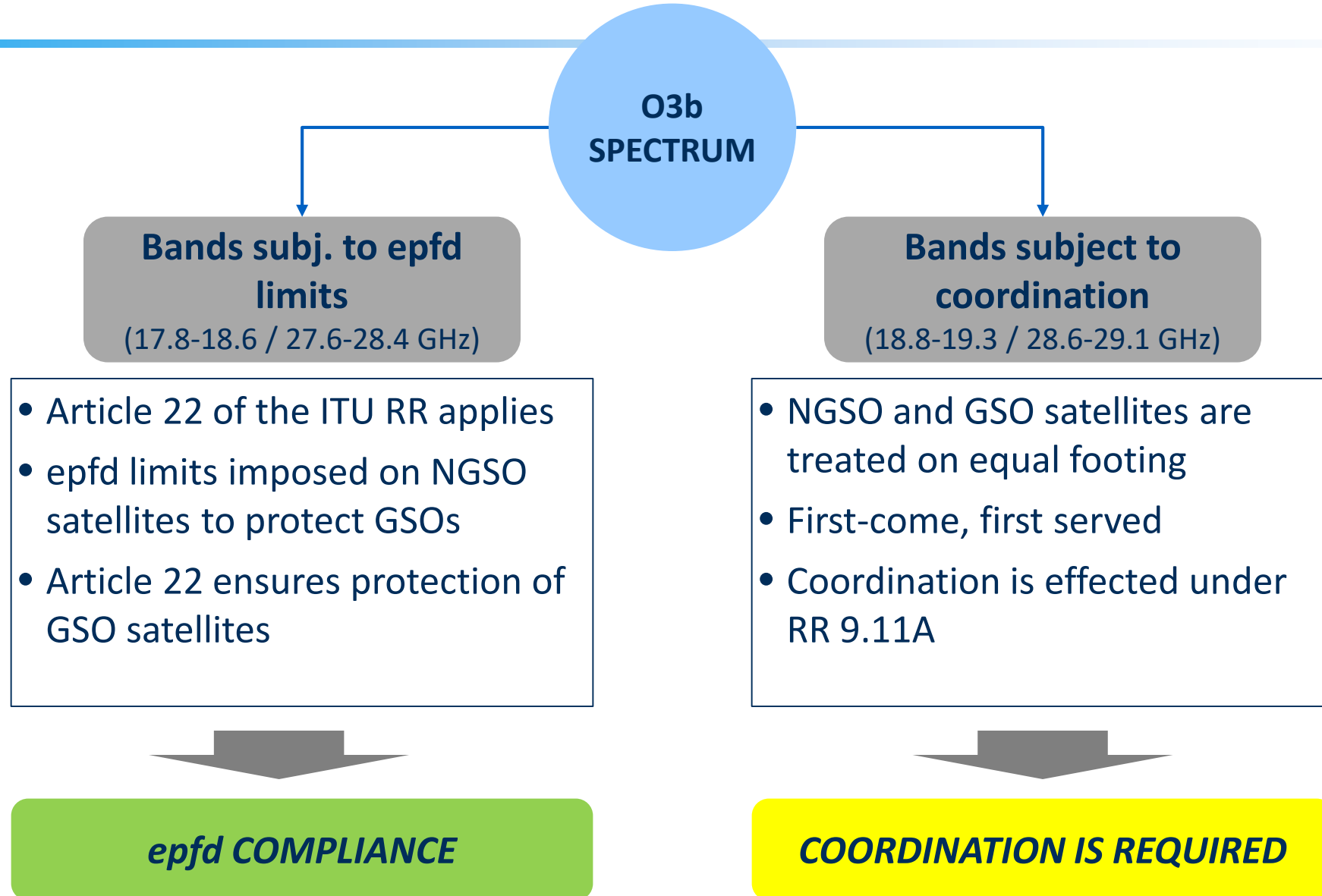


0.85m/1.0m/1.2m/1.8m/2.4m
Transportable

O3b Frequency Plan



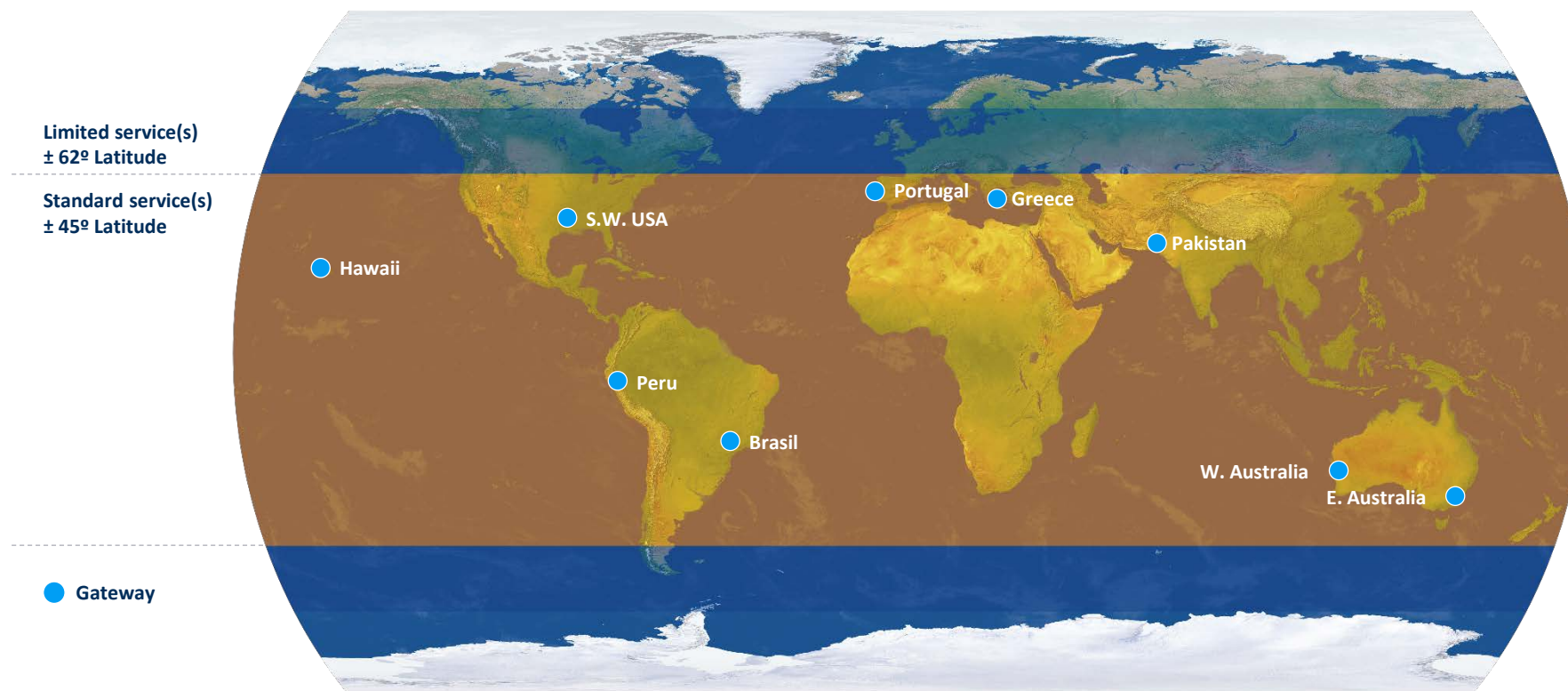
Applicable ITU Rules & Regulations



AGENDA

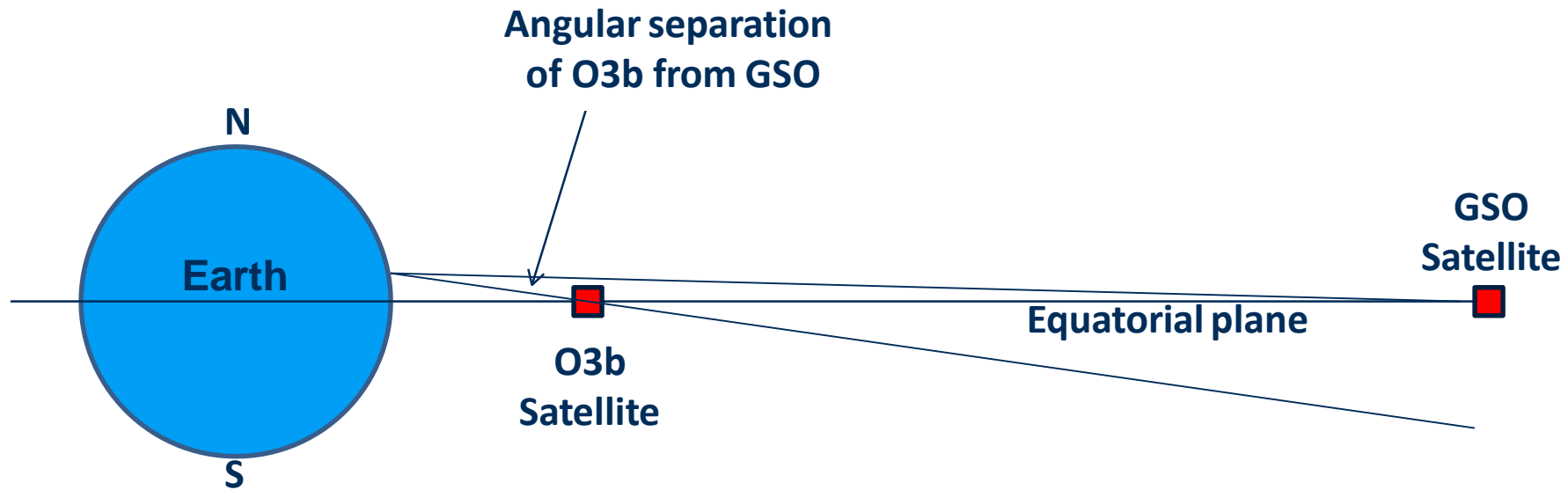
1. O3b – one year on
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NGSO Sharing: Geographical separation



Customers can connect to fiber infrastructure through Regional Gateways

Inherent Angular Separation of O3b Orbit from GSO



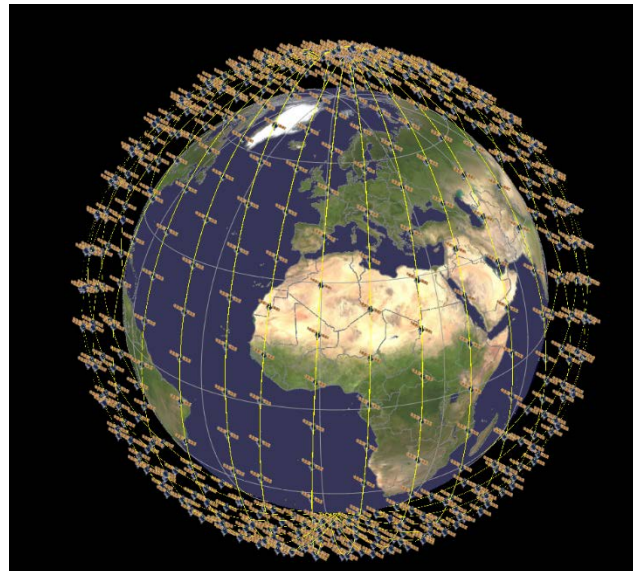
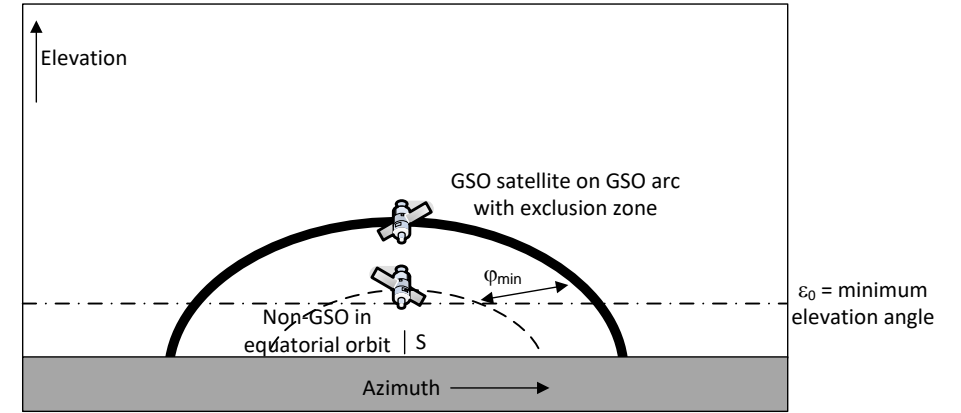
NGSO sharing

SPACE VIEW

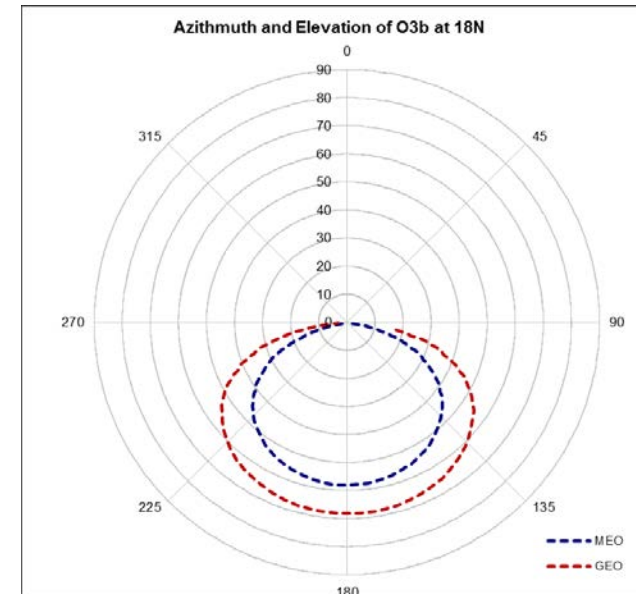


O3b

EARTH VIEW



Inclined NGSO



AGENDA

1. O3b – one year on
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3. **Bringing into use**

Bringing Into Use (BIU)

- Circular Letter CCRR/57 – Draft Rules of Procedure to reflect the decisions of WRC-15 issued by the Radiocommunication Bureau on 28 July 2016.
- Draft new or modified Rules of Procedure
 - Decisions of WRC-15 that do not appear in the Conference's Final Acts, but are reflected in the minutes of WRC-15 plenary meetings
- The draft Rules of Procedure are available to administrations for comment, to be considered at the 73rd meeting of the Radio Regulations Board

Bringing Into Use (BIU): Study Topics

- Does one-size-fits-all approach works for BIU?
- Are one or two satellites sufficient to BIU a constellation?
- Deployment Plan: undefined in the Radio Regulations
 - what information is necessary in the deployment plan?
 - the consequences of not following the deployment plan?
 - the implications of a challenge to the deployment plan by another administration?
- Operators need to deploy additional satellites to meet demand
 - But not seeking more protection or causing more interference
- Minimum number of satellites “required to deliver the proposed satellite service”
 - How does this relate to the definitions for each satellite service in the Radio Regulations?
- Needs Study at ITU WP4A



Networks

Fiber Speed. Satellite Reach.