

# Telesat LEO

## Fiber quality connectivity everywhere

ITU Regional Seminar for CIS and Europe  
"Development of modern radiocommunication ecosystems"

June 2018

Mario Neri

Director, International Coordination - Telesat International Limited

# About Telesat

Telesat is one of the world's largest global satellite operators

**C\$927 million**

2017 revenue

**C\$3.8 billion**

Contracted revenue backlog

**C\$5.7 billion**

2017 year-end assets

**C\$380 million**

2017 free cash flow



Telesat offices

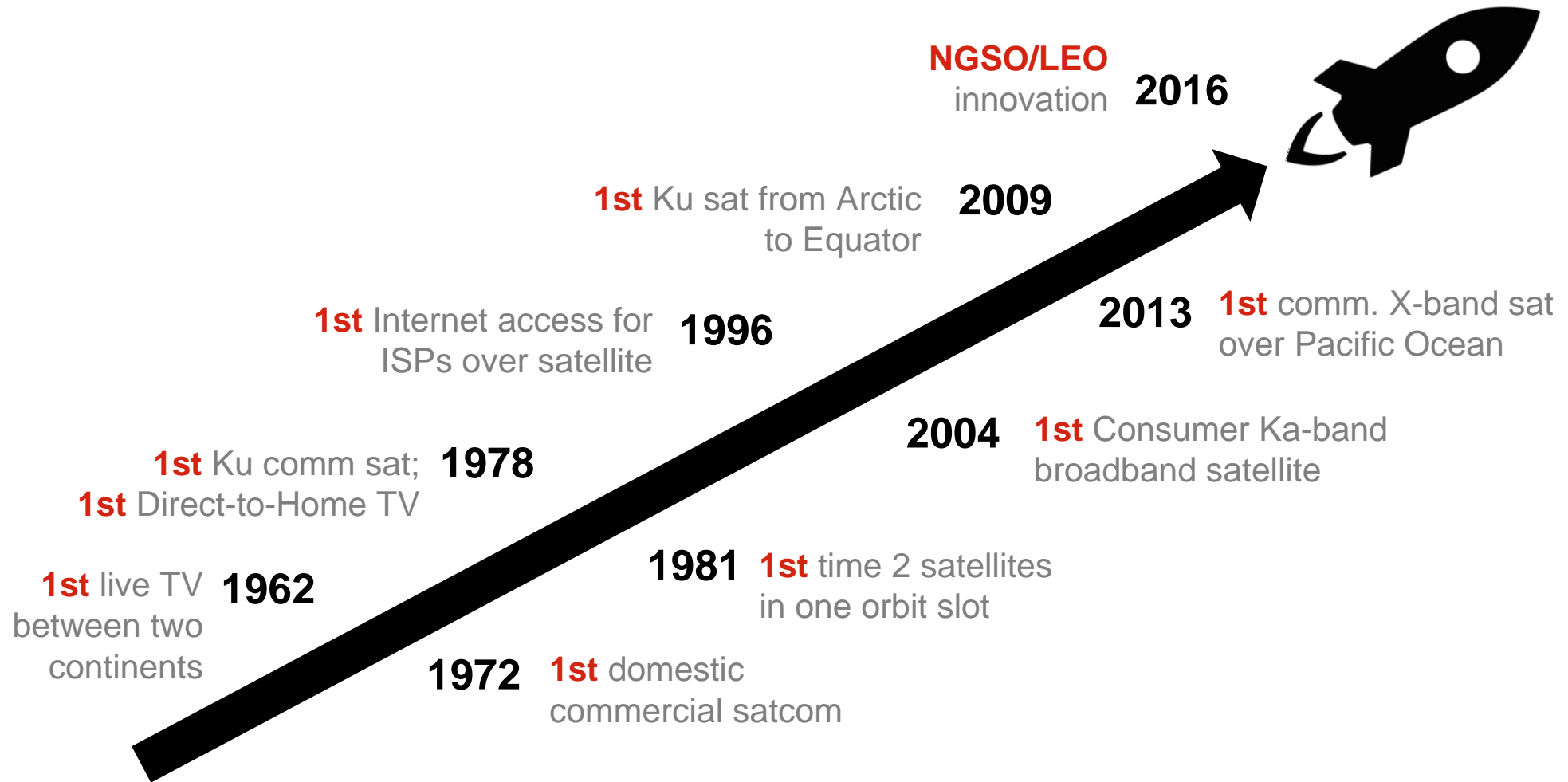
Privately held by Loral Space & Communications (NASDAQ: LORL) and Canada's Public Sector Pension Investment Board

Global customer base; largest technical consultant to regional satellite operators and governments



# About Telesat

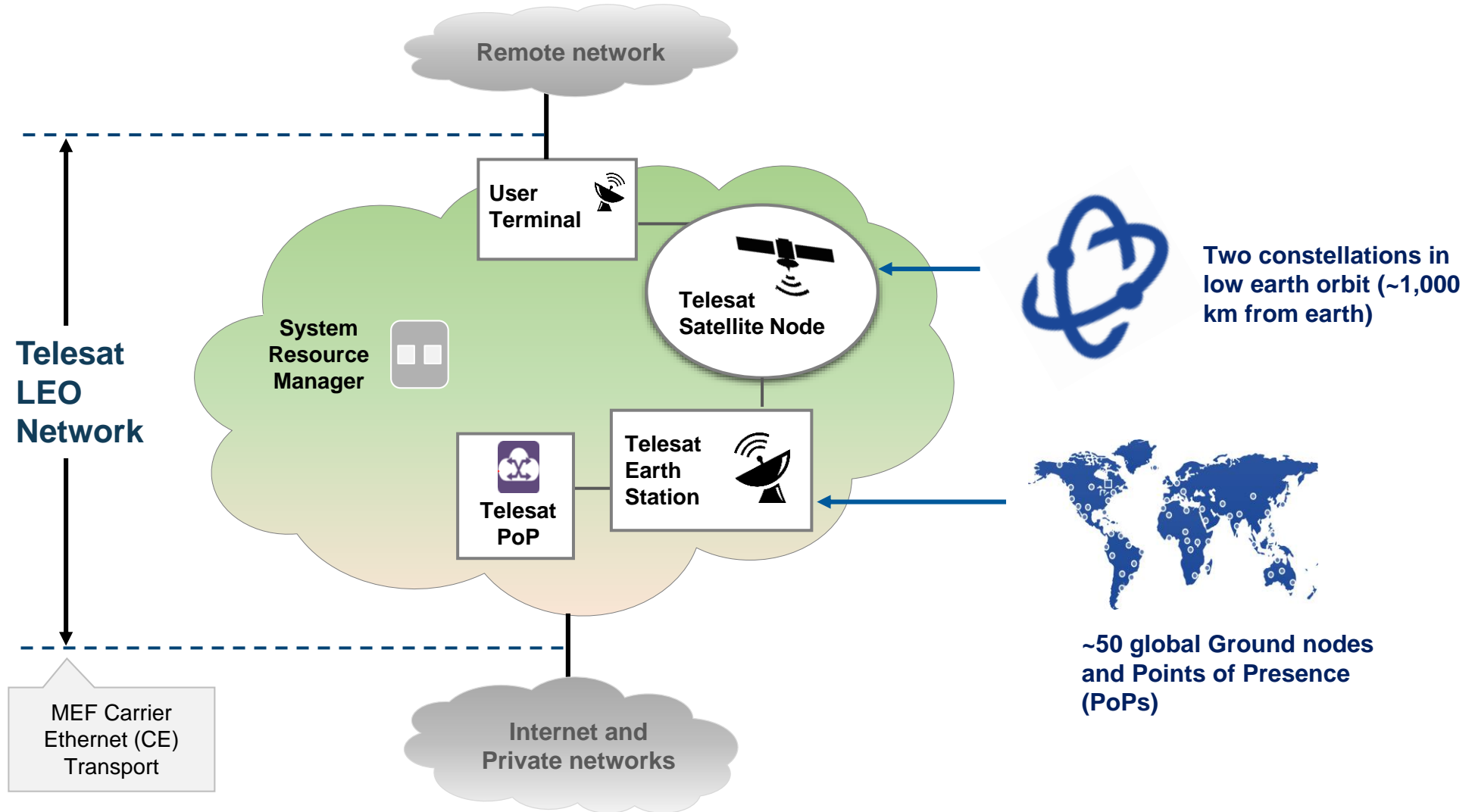
## 50+ years of successfully commercializing innovations



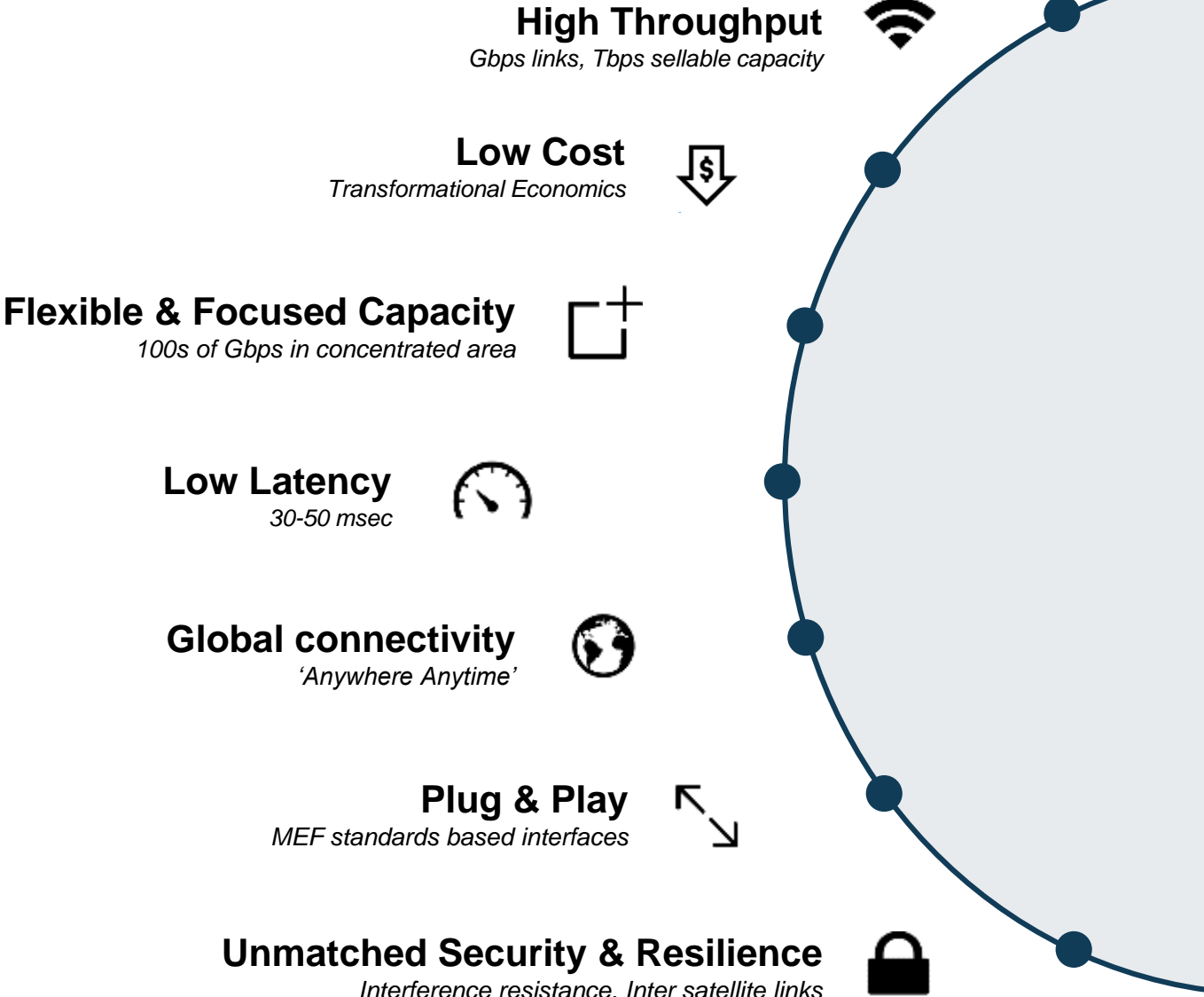


# What is Telesat LEO?

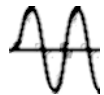
## Advanced LEO satellite constellation that will seamlessly integrate with terrestrial networks



# Telesat LEO designed to meet requirements for next generation global broadband



**Advanced LEO constellation to economically meet future need**



**4 GHz of Ka-band Spectrum (User & Gateways)**



**Polar & Inclined Orbits**  
*Global coverage from poles to equator, patent pending*



**Direct Radiating Antennas & Satellite Onboard Processing**  
*Flexible beams*



**Inter-Satellite Links**  
*Optical technology*

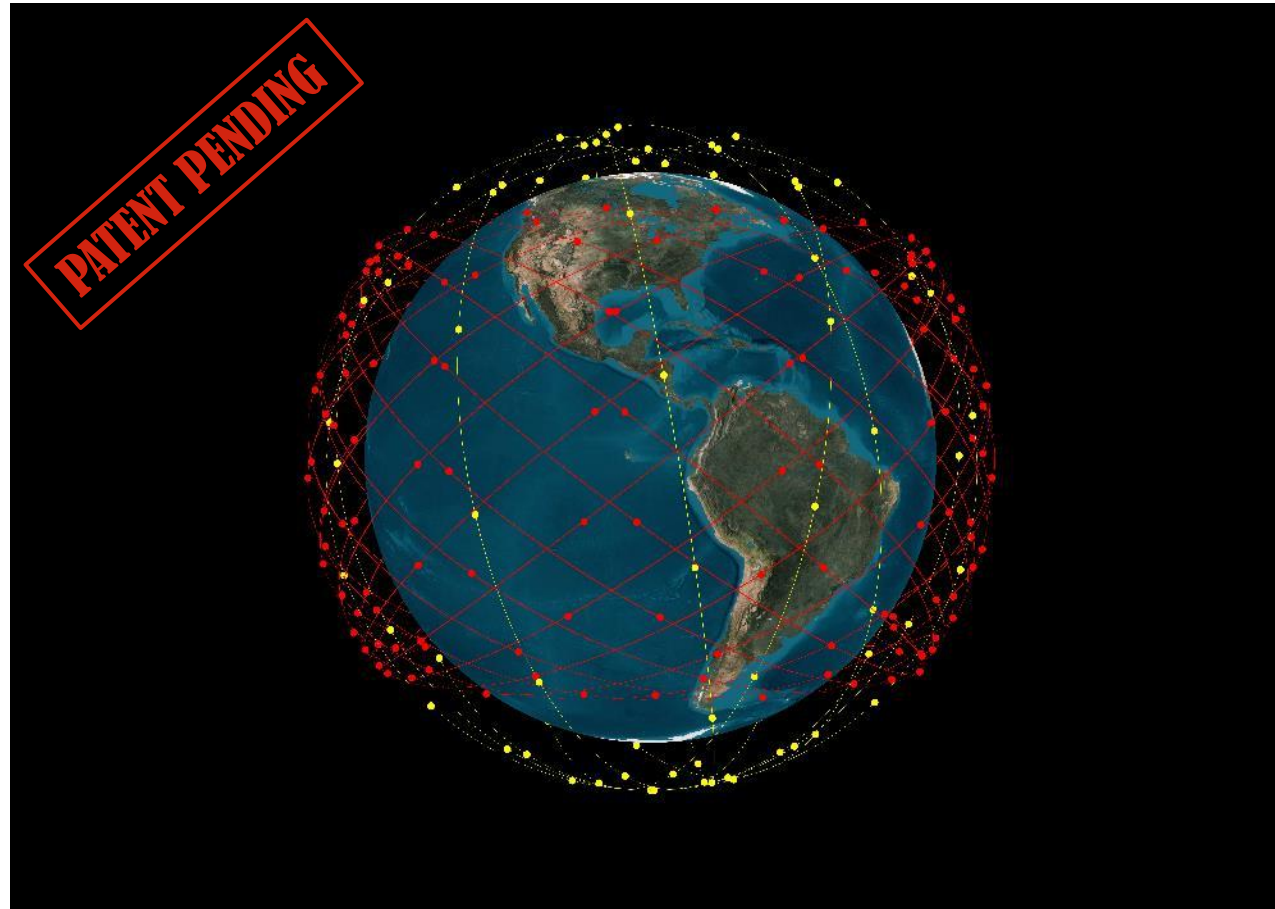


**Global gateway network**  
*About 50 global locations*



**System Resource Manager**  
*Optimized capabilities*

**Combined  
Polar and  
Inclined orbits  
efficiently  
provide global  
coverage while  
maximizing  
capacity over  
high-demand  
areas**



**Polar Orbit at 1,000 km**

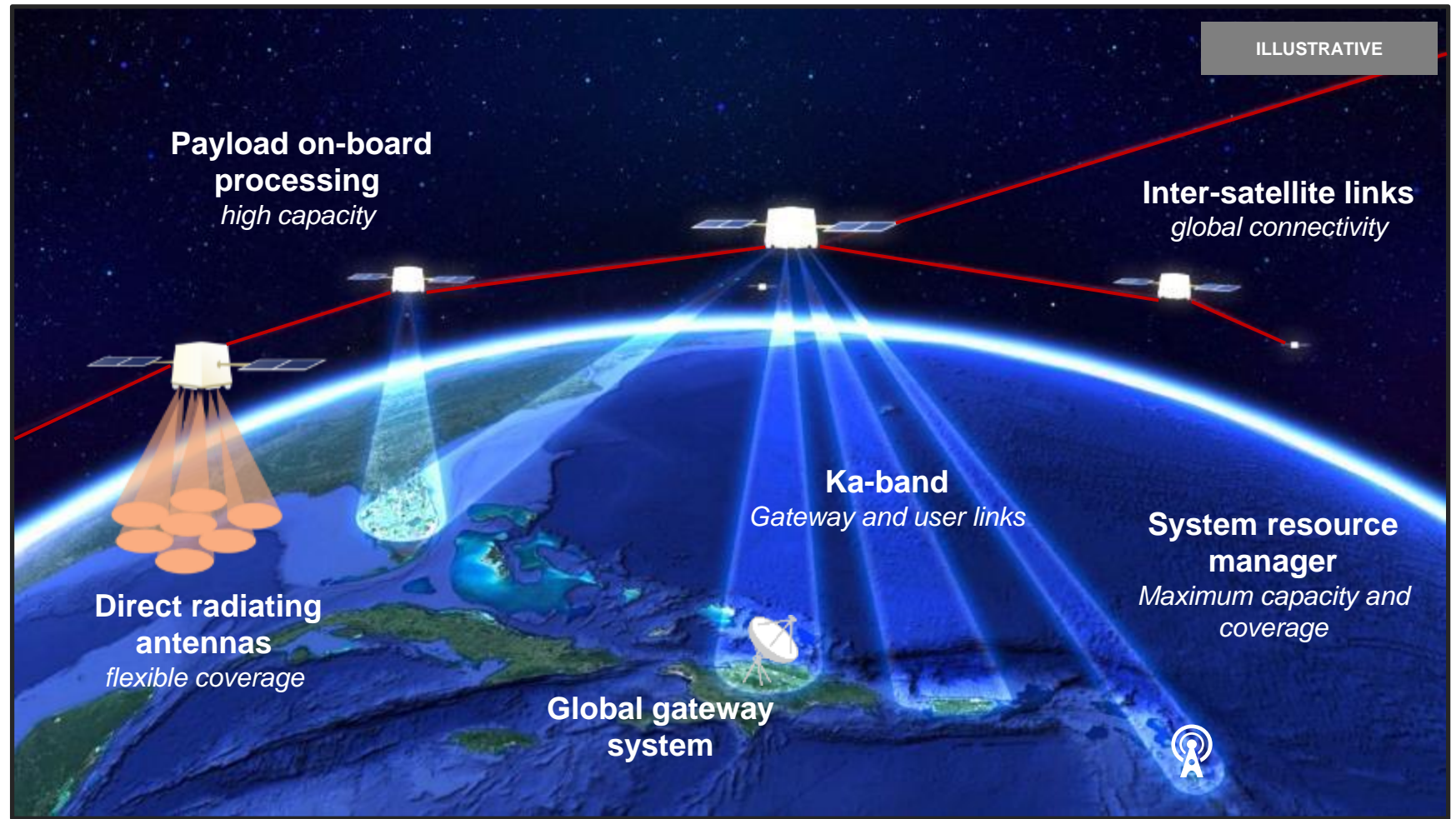
**Inclined Orbit at 1,248 km**

**Initially composed of 117  
satellites**

- ✓ **Global coverage: connect anywhere to anywhere**
  - ✓ **Capacity focused on areas of demand**



Advanced space and ground technology ensure both high capacity and high flexibility

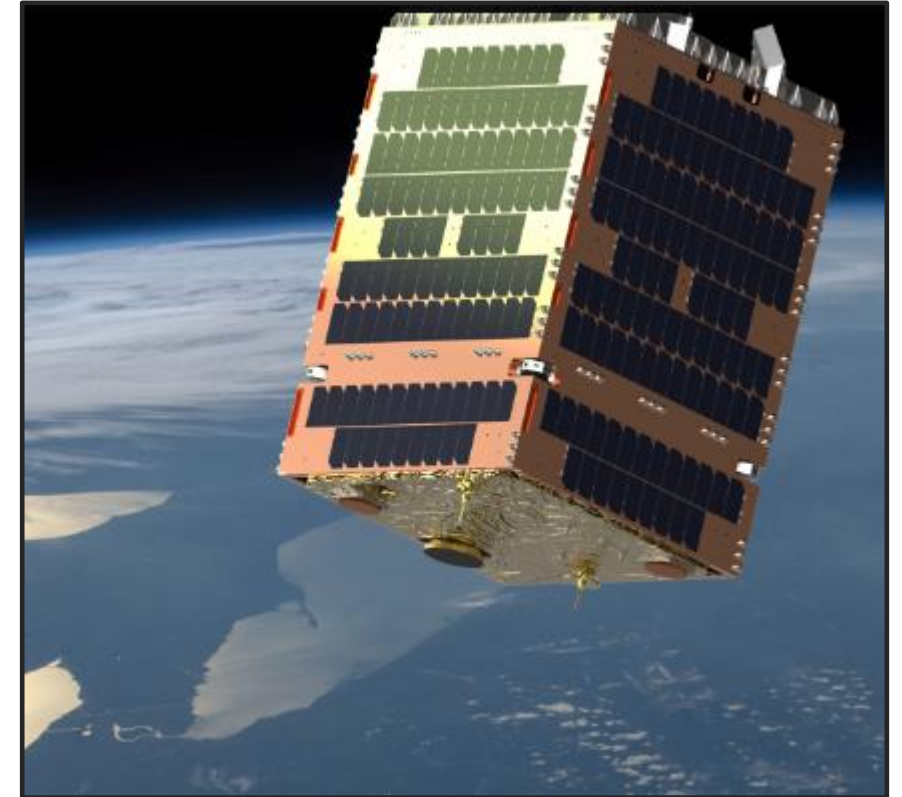


- ✓ Capacity enabled in areas of greatest demand
  - ✓ High flexible & adaptable capacity
  - ✓ Up anywhere, Down anywhere



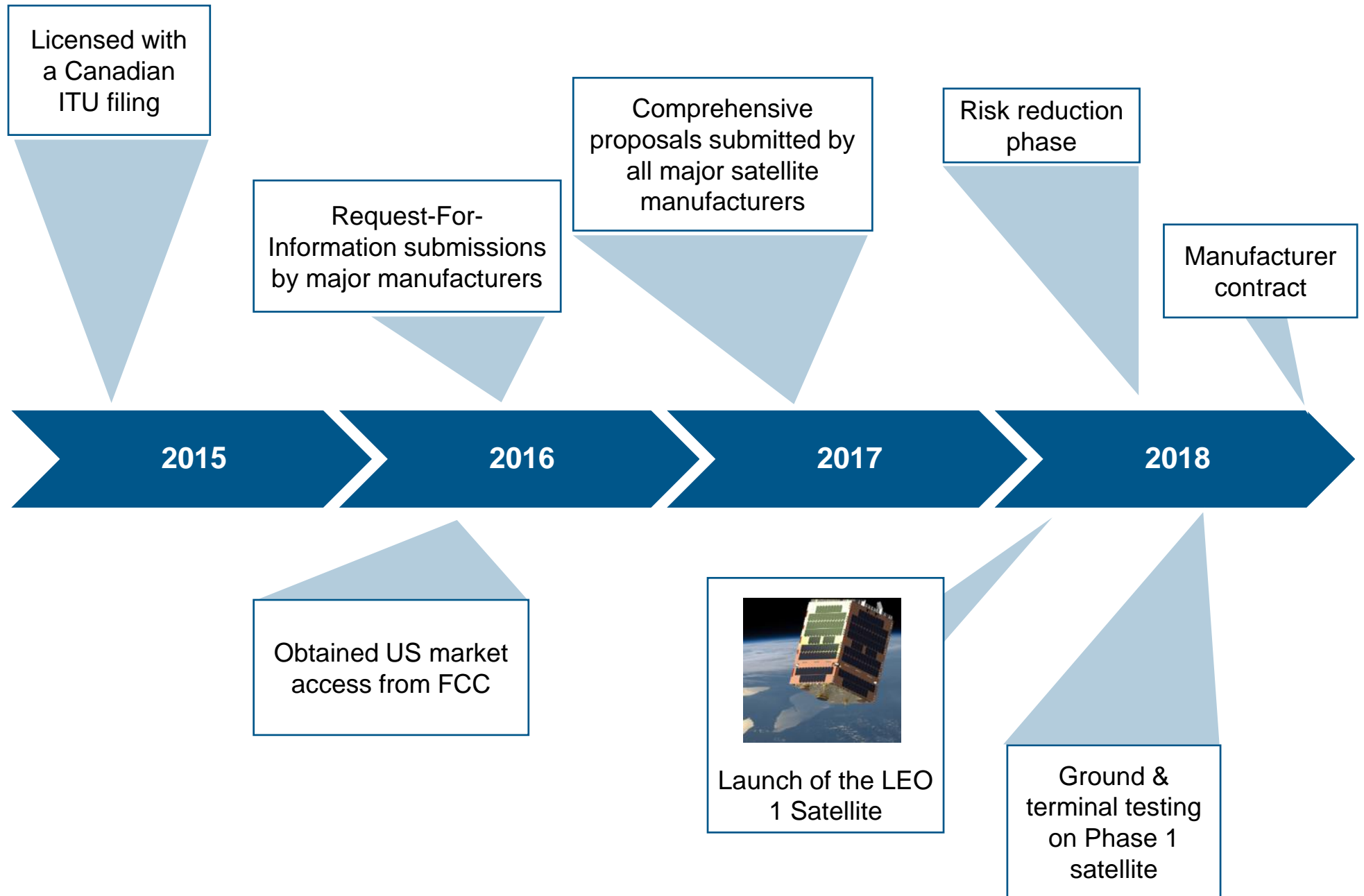
## LEO 1 satellite launched

- **Launched in Jan 2018**
  - Orbit raising completed
  - Final orbit 1,000 km sun synchronous, 99.5 deg inclined
- **Tests using the satellite will include:**
  - Satellite tracking & Doppler compensation
  - Low latency network performance
  - User terminal validation
- **The satellite will be made available to selected customers and technology partners for tests & demonstration in the second half of 2018**



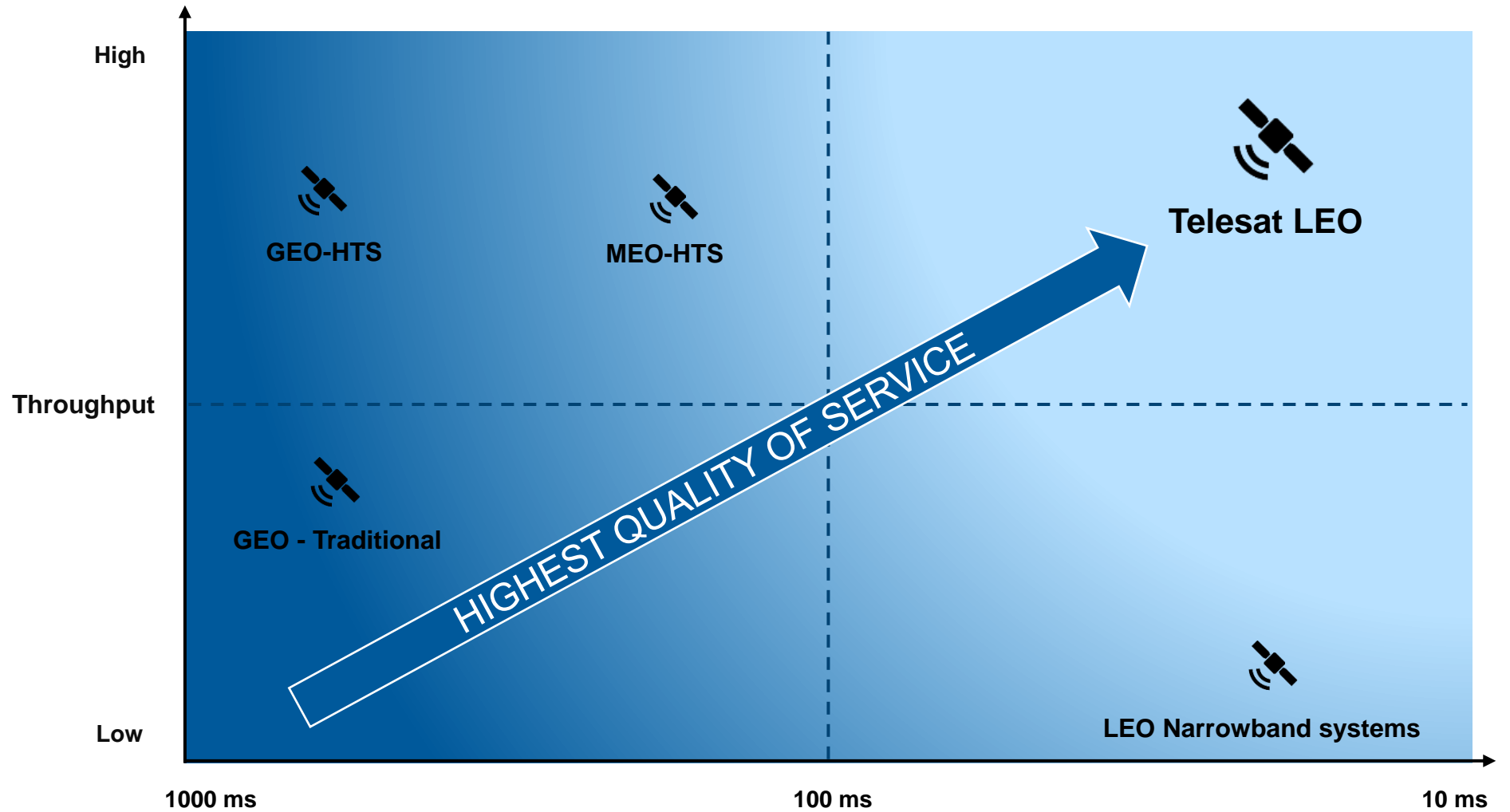
*Telesat LEO 1 satellite*

# Timeline



Telesat LEO  
meets future  
needs

## Low latency + High throughput = Highest Quality of Service



GEO = Geostationary orbit; MEO = Medium Earth Orbit, LEO = Low Earth Orbit



## What is “Issue A”?

### Issue A of Agenda Item 7 for WRC-19

- WP 4A is studying rules to regulate the **a)** Bringing into Use, and **b)** deployment of non-GSO satellite systems
- The idea was firstly introduced by the BR Director, who mentioned *“the possible speculative nature of [...] submissions that could lead to spectrum warehousing and resurgence of so-called “paper satellite networks” ”*
- The aim is for a satellite filing to reflect what is deployed of a non-GSO system after a certain period of time

ITU rules for non-GSO are likely to change at WRC-19

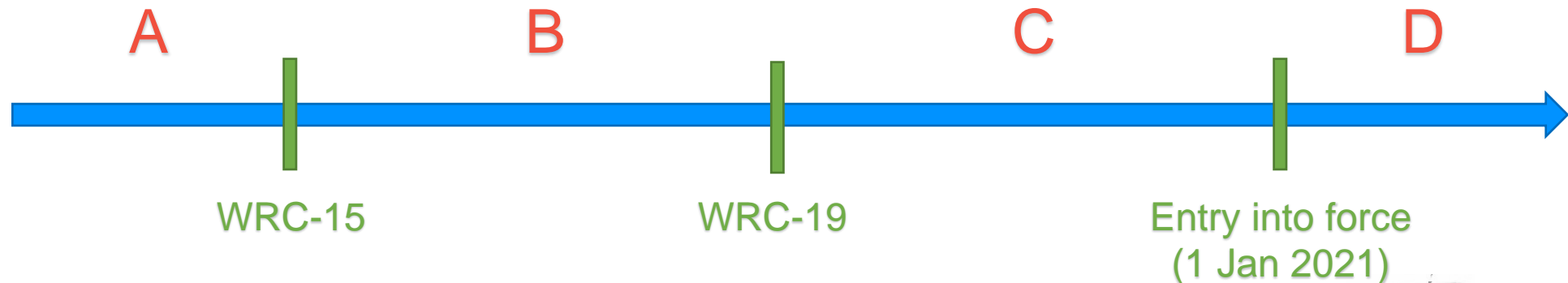
## Three of the Principles (already in the draft CPM text) driving WRC-19 AI 7 Issue A:

- Appropriate **time** should be given to allow the completion of the deployment of non GSO satellite systems (principle n.3)
- Appropriate **transitional measures** should be considered to address the implications of any new milestones adopted by WRC-19 (principle n.4)
- Concurrently with the development of a milestone-based approach, methodologies should be developed relating to the regulatory treatment of the **adjustments to the characteristics** of frequency assignments to non-GSO satellite systems (principle n.6)

## The importance of transitional measures

### Four categories of systems based on their regulatory deadline:

- A. Systems already brought into use and for which the regulatory deadline fell *before WRC-15*
- B. Systems not fully deployed and for which the regulatory deadline falls *between the end of WRC-15 and the end of WRC-19*
- C. Systems for which the regulatory deadline falls *between the end of WRC-19 and the entry into force of the final acts of WRC-19*
- D. Systems for which the regulatory deadline falls *after the entry into force of the final acts of WRC-19*





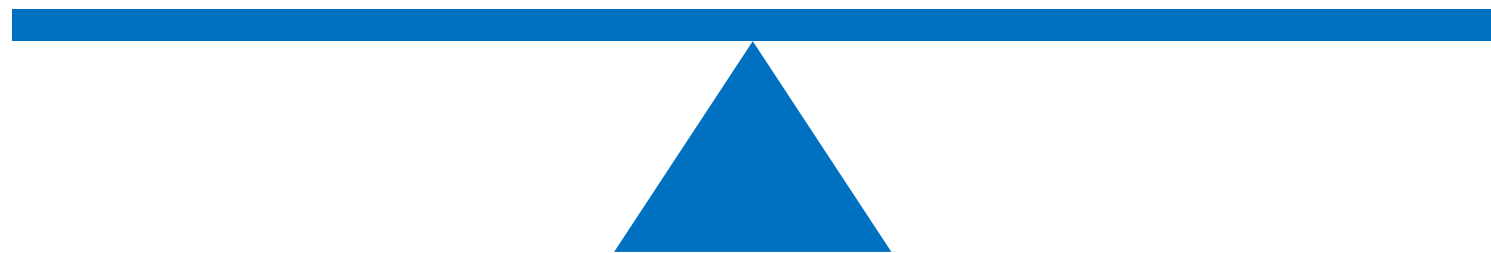
## Striking a balance

Although it is not possible to draft one single rule fitting systems with so many different filing maturities, it is still possible to treat them **equitably**

**New milestones must strike a balance**

**Prevention of  
Spectrum  
Warehousing**

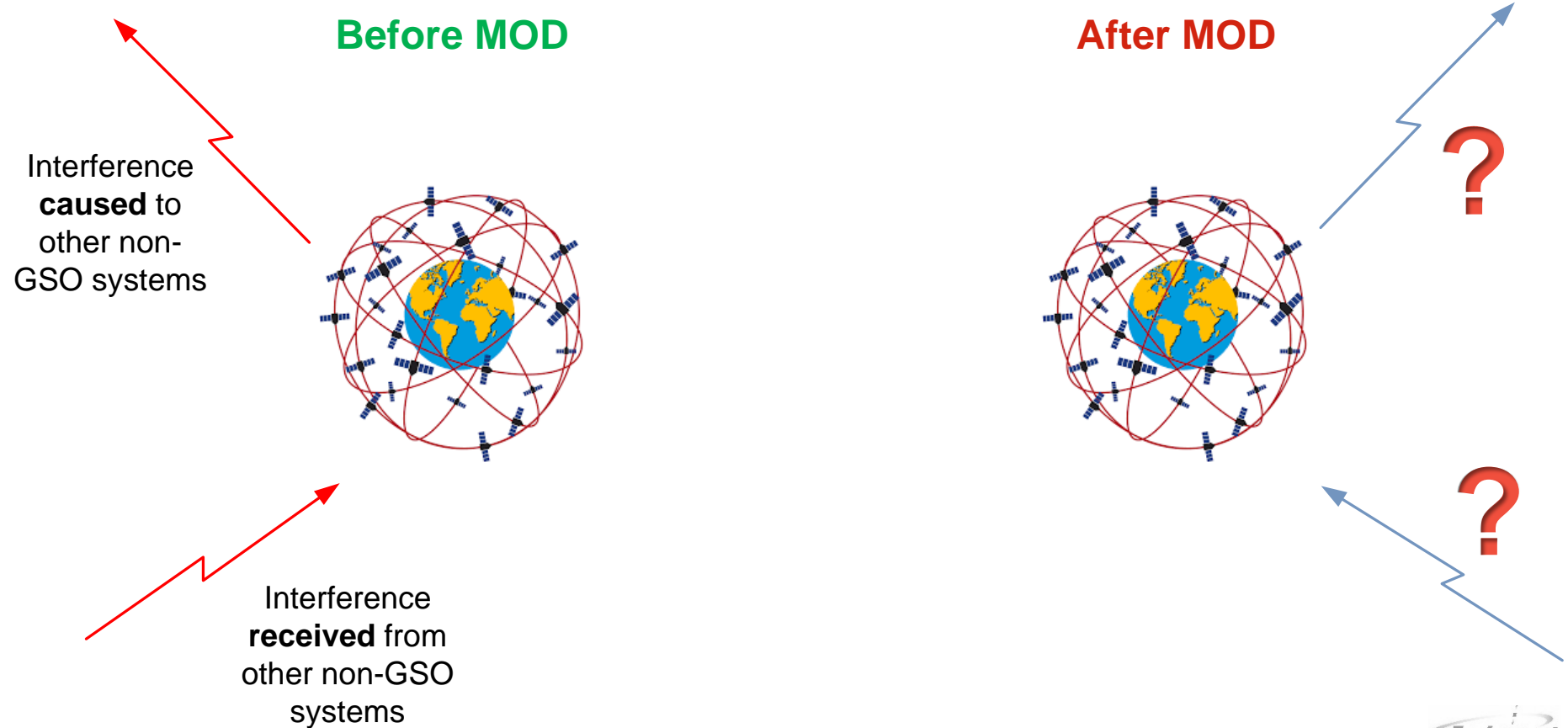
**Development of  
transformational  
systems**



# Changes to a non-GSO system

## No ITU methodology to assess the consequences of a MOD

- If a non-GSO filing is changed, it may cause/receive more interference to/from other non-GSO systems
- Unlike the GSO case, there is no ITU-R-agreed methodology to determine the impact of any changes to the parameters of a filing



### With regard to Issue A of AI 7, WRC-19 should:

- Define appropriate ***transitional measures*** to allow those systems currently under development to come to fruition
- Invite administrations to develop in Working Party 4A an ITU-R ***methodology*** to assess the change in the interference environment of a non-GSO system following any changes to its filed parameters





**Telesat LEO**

**TRANSFORMING**

**GLOBAL COMMUNICATIONS**