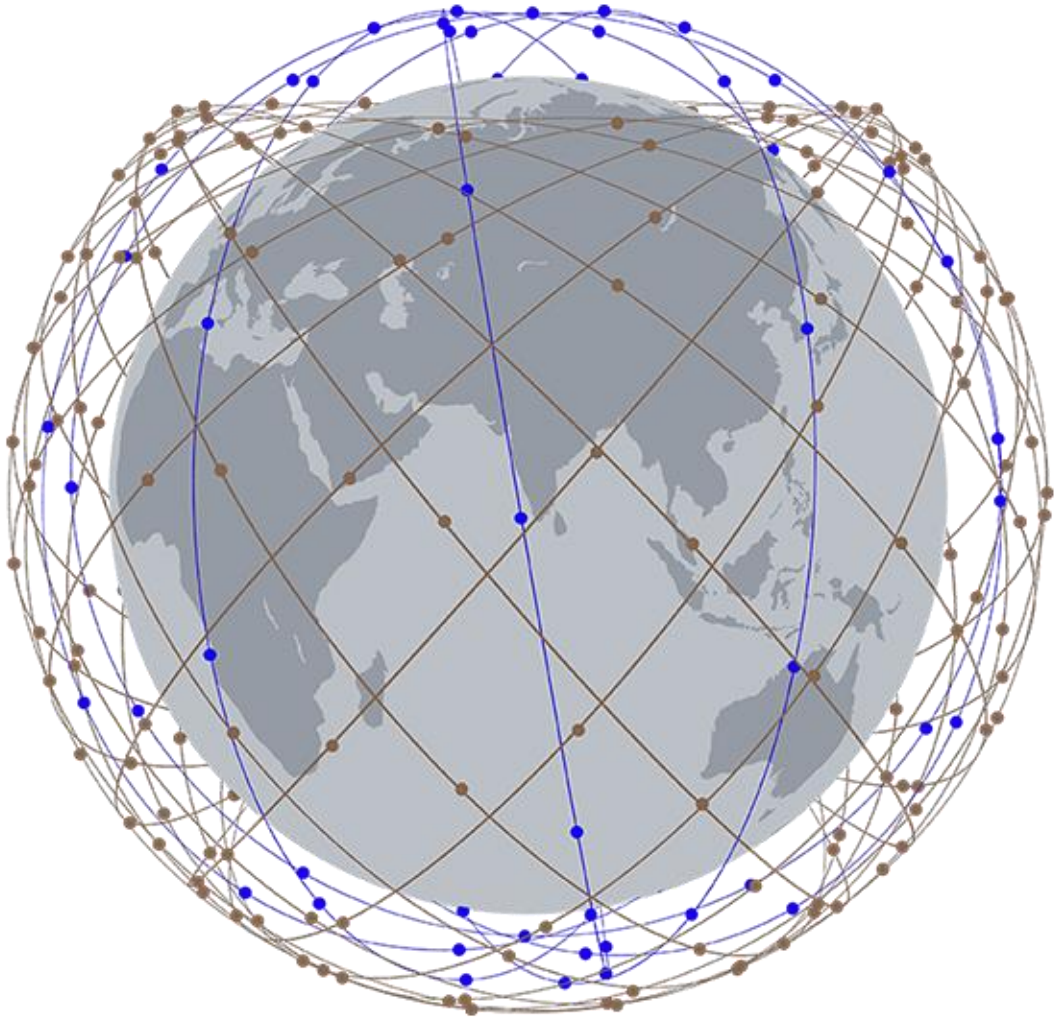
SIAINDIA
Satcom Industry Association

Conference on Satellite Enabled 5G Applications and Services



Balanced Approach to Spectrum Allocation - *Focus on Ka-band*

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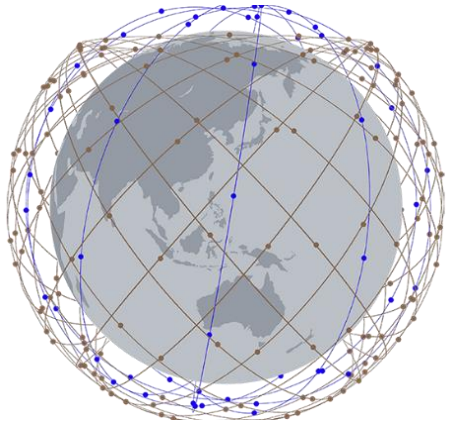
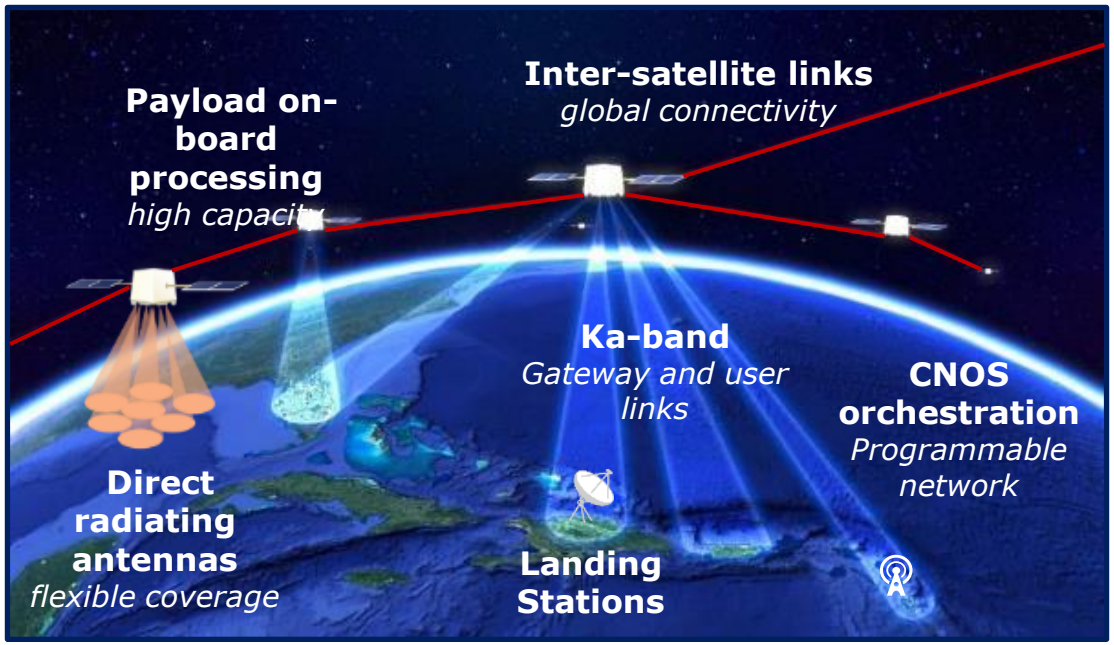
TELESAT LIGHTSPEED™

Telesat Lightspeed: cutting-edge global LEO network

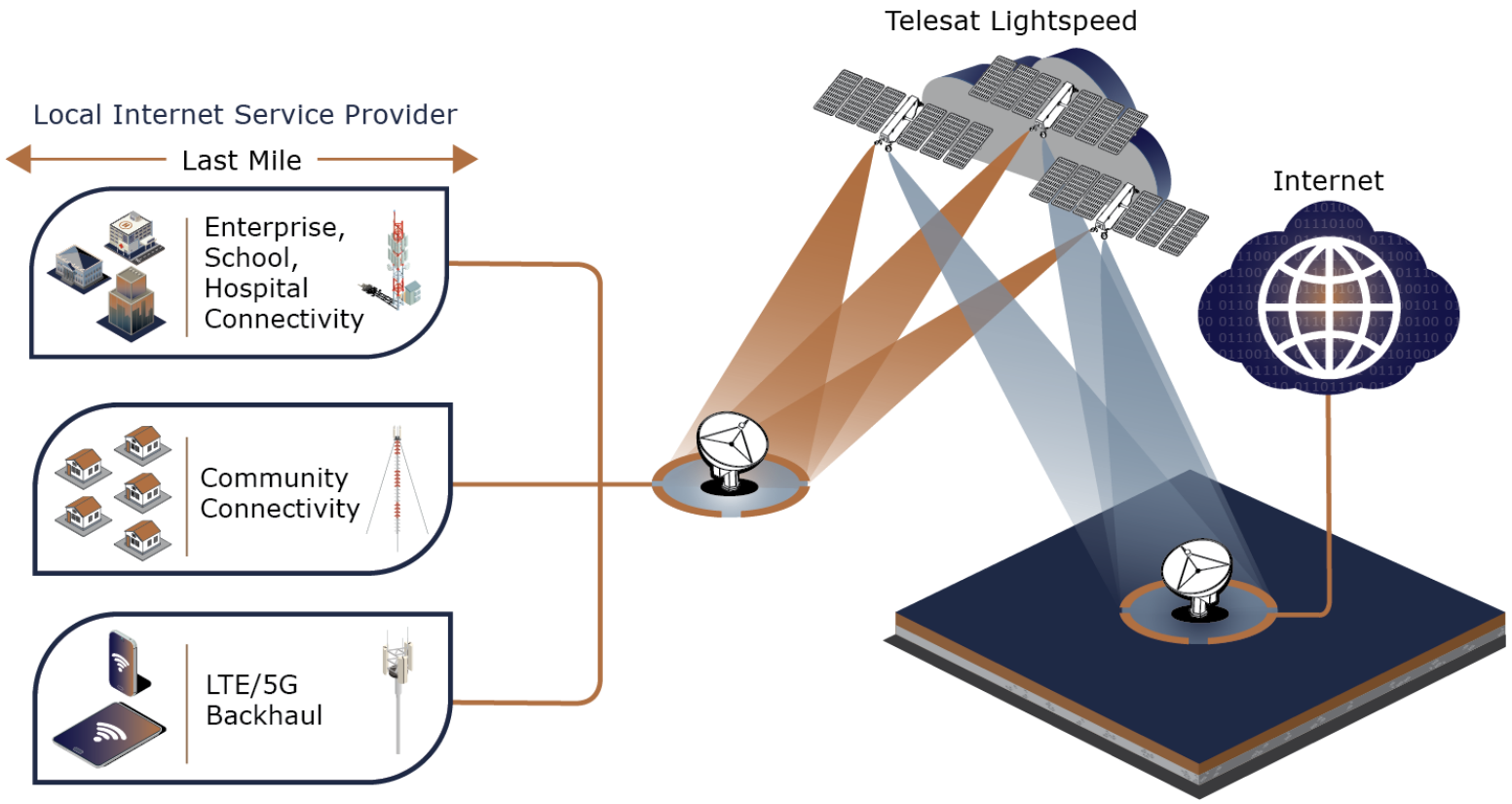




- √ **298 satellite constellation** with optical inter-satellite links, full global coverage from pole to pole
- √ ~35 times closer to Earth than traditional satellites for **fibre-quality low latency**
- √ **~4 GHz Ka-band spectrum** and agile beams to flexibly connect small to very large sites (few Mbps to multiple Gbps links)
- √ End-to-end (space + ground) network for **quick and economic** connectivity to remote sites
- √ Multiple satellites and ground nodes for **resilient, always-on** connectivity to rural and remote areas
- √ US$5B capex with **flexible, state-of-the-art design** delivers most competitive unit economics
- √ **Scalable architecture,** addition of satellites will increase capacity deliverable by the network

Telesat Lightspeed: Complete community coverage

Unparalleled enterprise connectivity solution in key verticals



Distributing Telesat Lightspeed services through telcos and service providers offers a flexible and competitive solution to the end customer

In the community aggregator model, the telecom operator:

- Owns the enterprise-class terminal
- Provides the last mile connectivity to homes, schools, businesses
- Provides customer support

No single technology can satisfy all telecommunication needs

- **5G global success requires a "Network of Networks"**

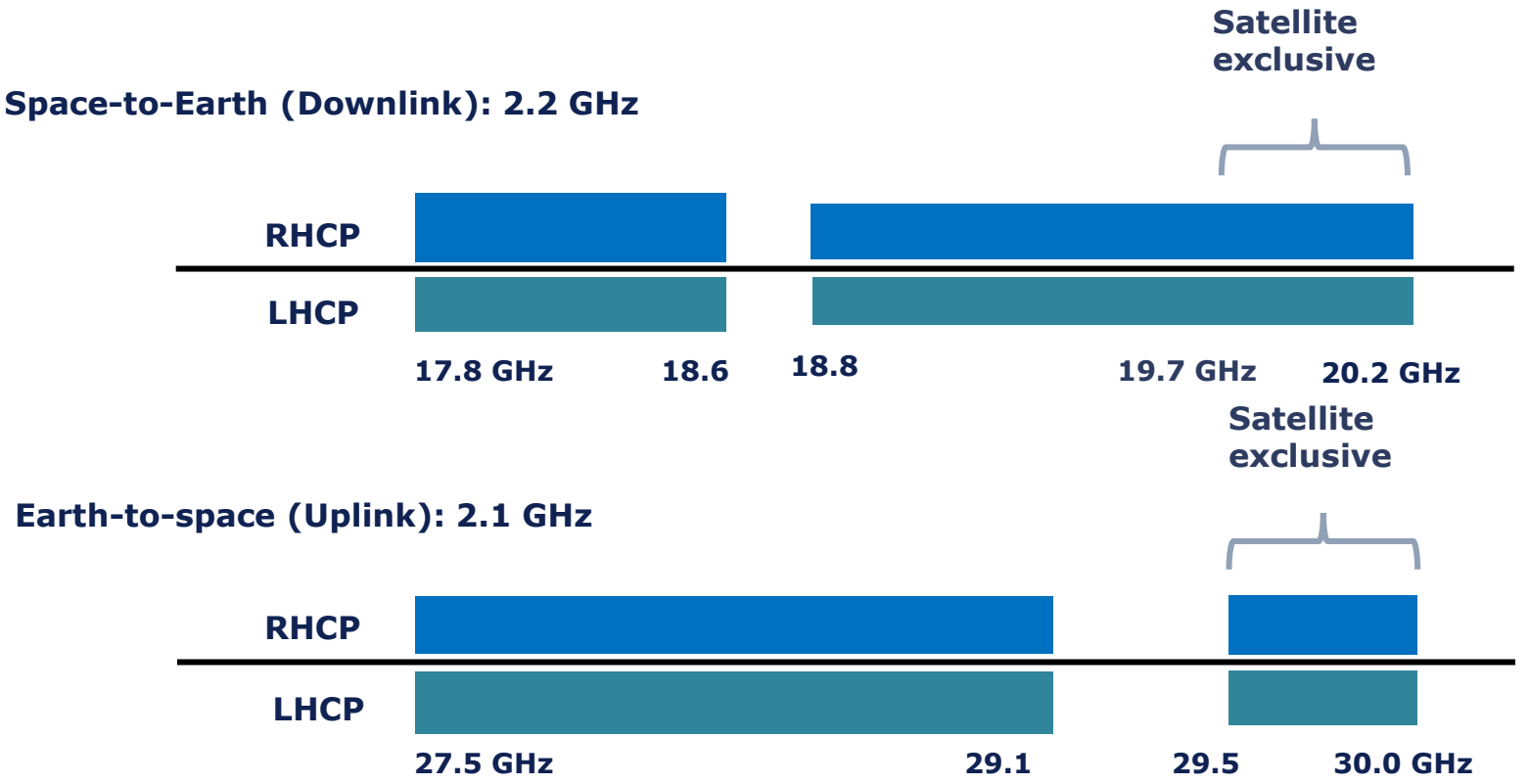
No global, regional or even national 'one size-fits-all' solution - no need to limit it to a single technology

- **Backhaul via satellite to extend the connectivity reach of telecoms operators**
  - Decreases time to market
  - Lowers risk on investment
  - Eliminates large infrastructure deployments
  - Allows for revenue generation in new, hard to reach markets
- **Satellite is the answer to rapid rollout of broadband across India**
  - Direct Connectivity
  - Community WiFi
  - Mobile backhaul
  - E-services (healthcare, etc.)

Synergy needed between satellite and terrestrial operators, also in terms of spectrum use

Telesat Lightspeed Ka-band spectrum

Spectrum for both User Terminal (service) links and Landing Stations (feeder) links:



Spectrum allocation by auction

▲Satellite spectrum auctions

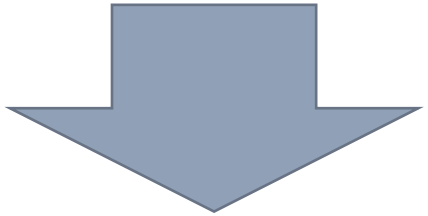
- For terrestrial mobile services spectrum cannot be shared amongst the operators
- In the case of satellites, the same microwave spectrum can be (and is) used by multiple operators to serve the same geographic area
- Assignment by auction would lead to
  - unnecessary spectrum segmentation and, therefore, a very inefficient use of spectrum
  - Artificial limitation of the range of satellite services available to customers
- There are no precedents of microwave satellite spectrum assignment by auction

▲28 GHz band auction for terrestrial 5G

- Due to the terrestrial propagation, this band can be used for 5G deployment only in limited areas
- Exclusive nationwide allocation to terrestrial 5G would unnecessarily sterilize valuable spectrum in areas where terrestrial 5G will never be deployed
- Spectrum denial to satellites which, in turn, can provide instant national (and global) coverage in the same band
- Actual usage of other bands for 5G to be assessed first

Use of the 28GHz band by satellites

- **27.5-29.5 GHz is of paramount importance to modern satellite systems**
- **5G services will need backhauling which can be effectively provided by novel satellites**
- **"Win-win" synergetic approach to telecommunications in India**
  - Limiting satellite capacity, by limiting access to part of the Ka-band, will damage the synergy envisaged between these two essential and complementary services
  - In any case, FSS fixed earth stations (including gateways) should always be allowed in the band, as they can be coordinated



- **28GHz band to be retained for satellite use (allowing also ubiquitous user terminals)**
- **Satellite gateways to be allowed in the entire band**

Key Conclusions

- Telesat Lightspeed will provide much needed capacity with flexibility, low latency and transformational economics in India and worldwide
- 5G success requires a win-win synergy with other technologies, including a balanced approach to spectrum use in India
- Backhaul via satellite to extend the connectivity reach of telecoms operators
- 27.5-29.5 GHz is of paramount importance to modern satellite systems
- Allocation of satellite microwave spectrum by auction is not suitable
- Due to the terrestrial propagation characteristics, the 28GHz band can be used for terrestrial 5G deployment only in very limited areas
- **28GHz band to be retained for satellite use**
- **In any case, satellite gateways to be allowed in the entire band**