

FEB 2022

A 5G Americas White Paper

# 5G & NON-TERRESTRIAL NETWORKS

Presentation Slides

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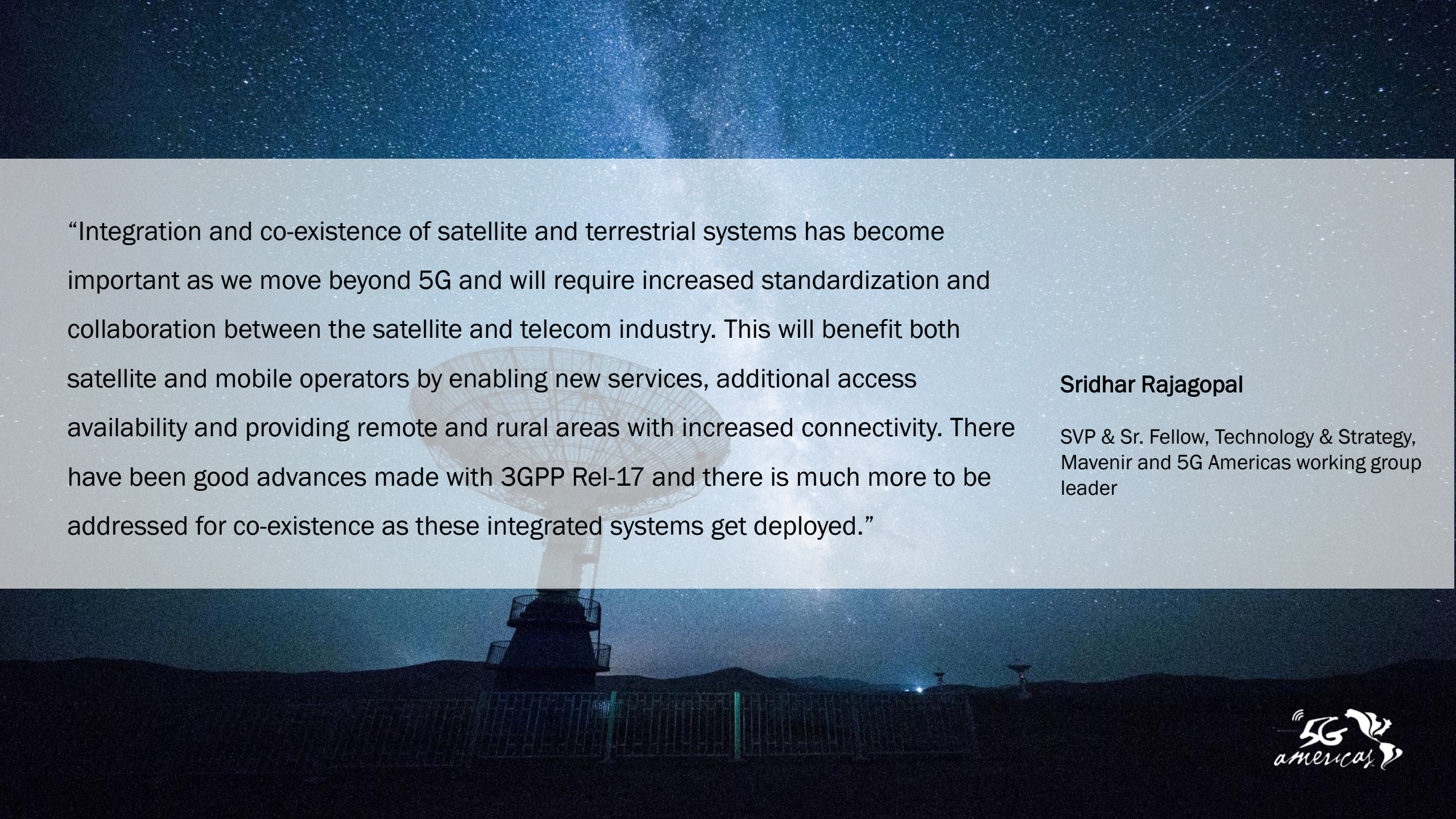


“New use cases become possible when 5G’s unique capabilities expand to more inaccessible regions with the help of non-terrestrial networks. Operators face interesting opportunities and challenges as new 5G standards pave the way towards increasing integration between terrestrial and non-terrestrial networks.”

Chris Pearson, President, 5G Americas







“Integration and co-existence of satellite and terrestrial systems has become important as we move beyond 5G and will require increased standardization and collaboration between the satellite and telecom industry. This will benefit both satellite and mobile operators by enabling new services, additional access availability and providing remote and rural areas with increased connectivity. There have been good advances made with 3GPP Rel-17 and there is much more to be addressed for co-existence as these integrated systems get deployed.”

**Sridhar Rajagopal**

SVP & Sr. Fellow, Technology & Strategy,  
Mavenir and 5G Americas working group  
leader





“3GPP Release 17 will introduce new network topologies into the 3GPP specifications that include high-altitude platforms and Low Earth Orbit and geosynchronous orbit satellites. New constellations of satellite deployments and work at 3GPP have provided a possible pathway for closer integration of terrestrial and non-terrestrial networks.””

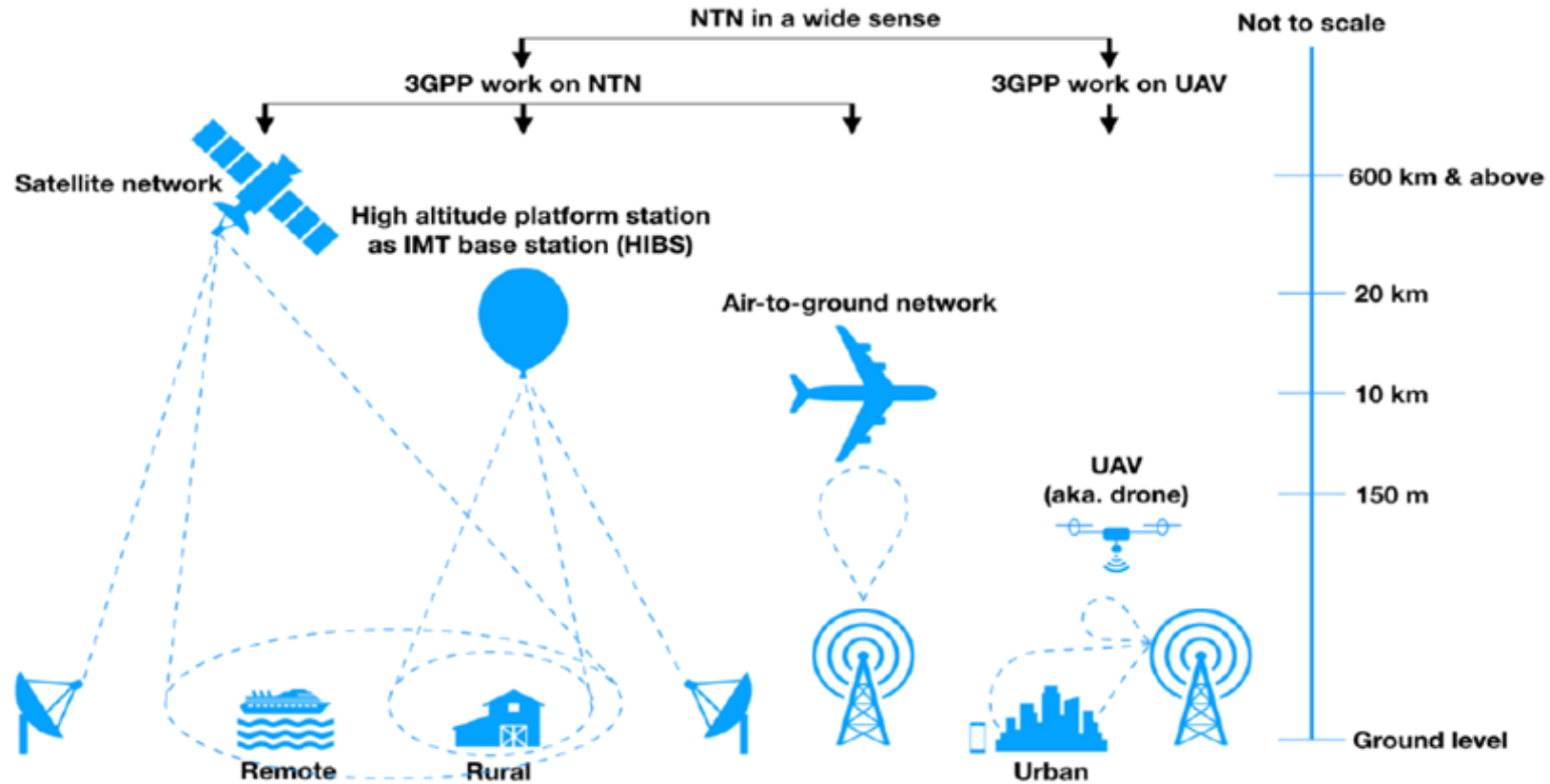
**Rahul Pal**

Principal Engineer, T-Mobile and 5G Americas working group leader

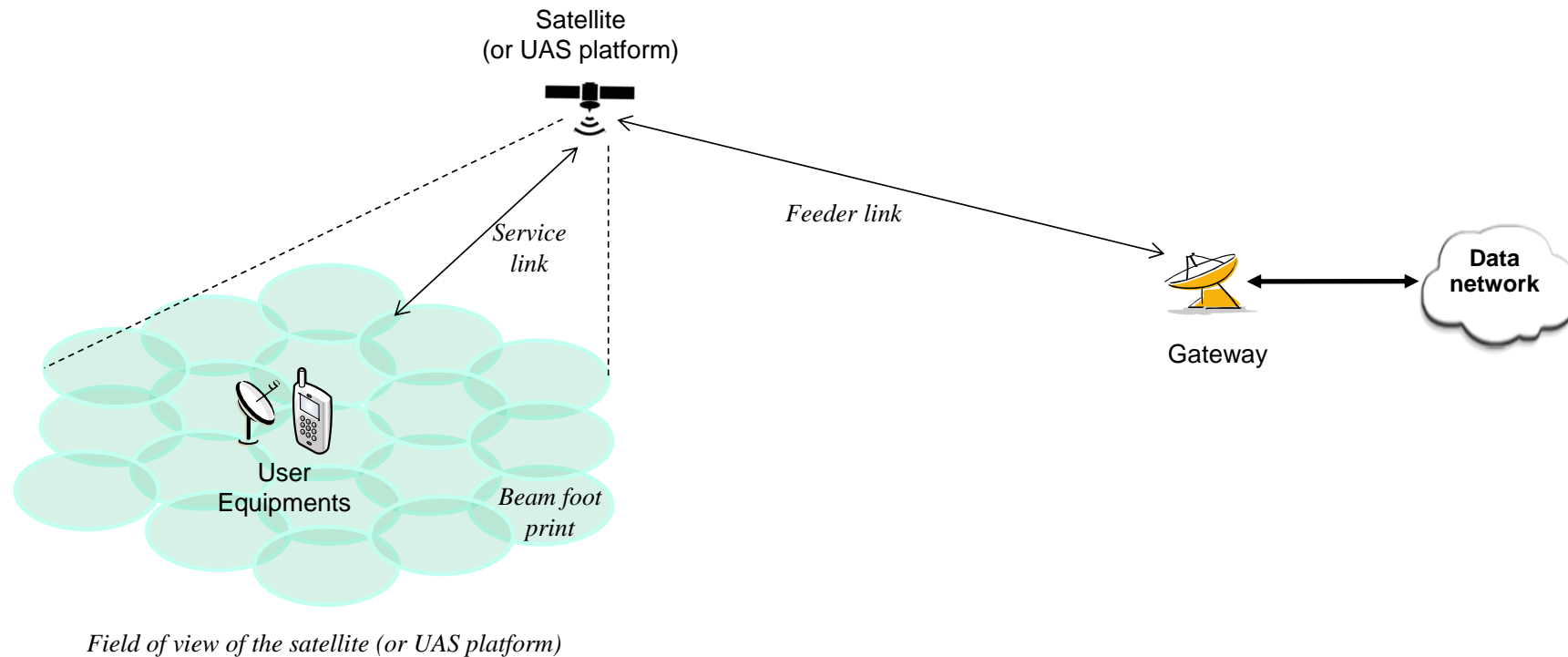




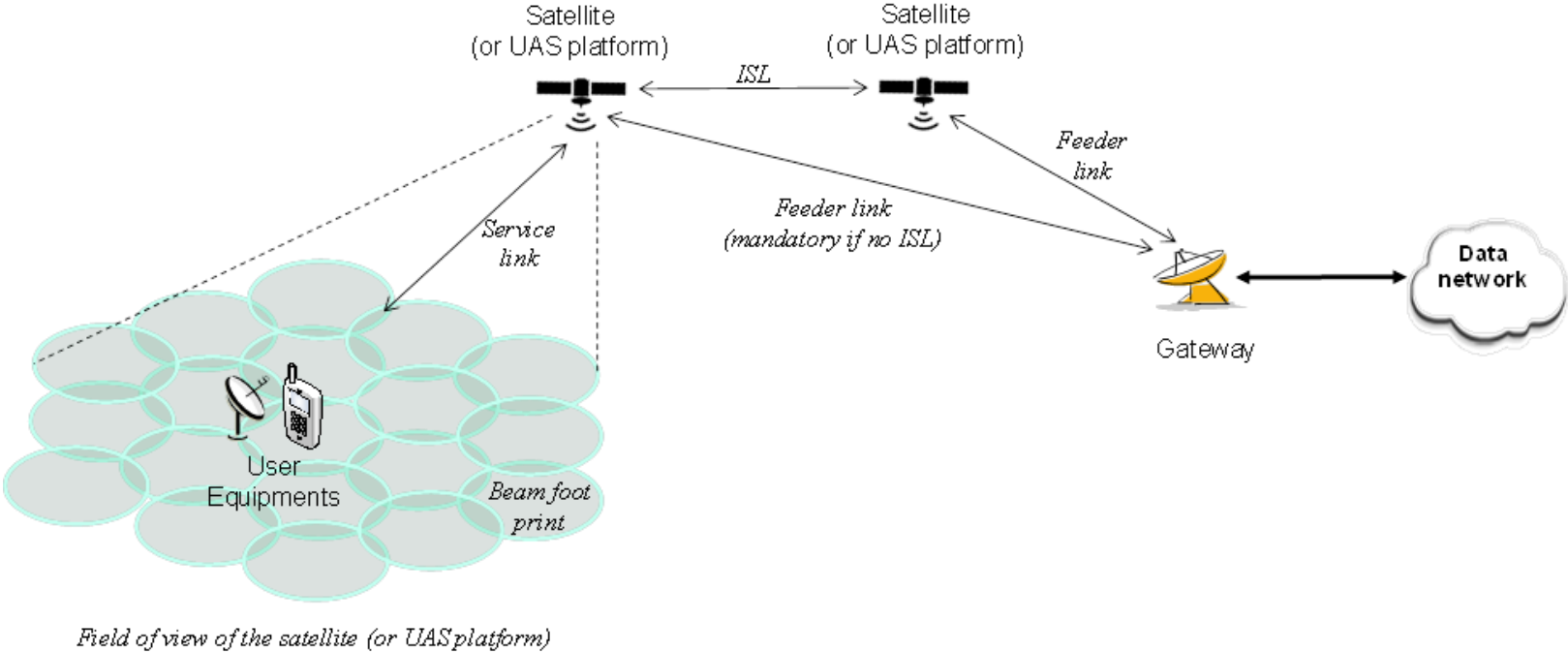
# Different types of non-terrestrial networks



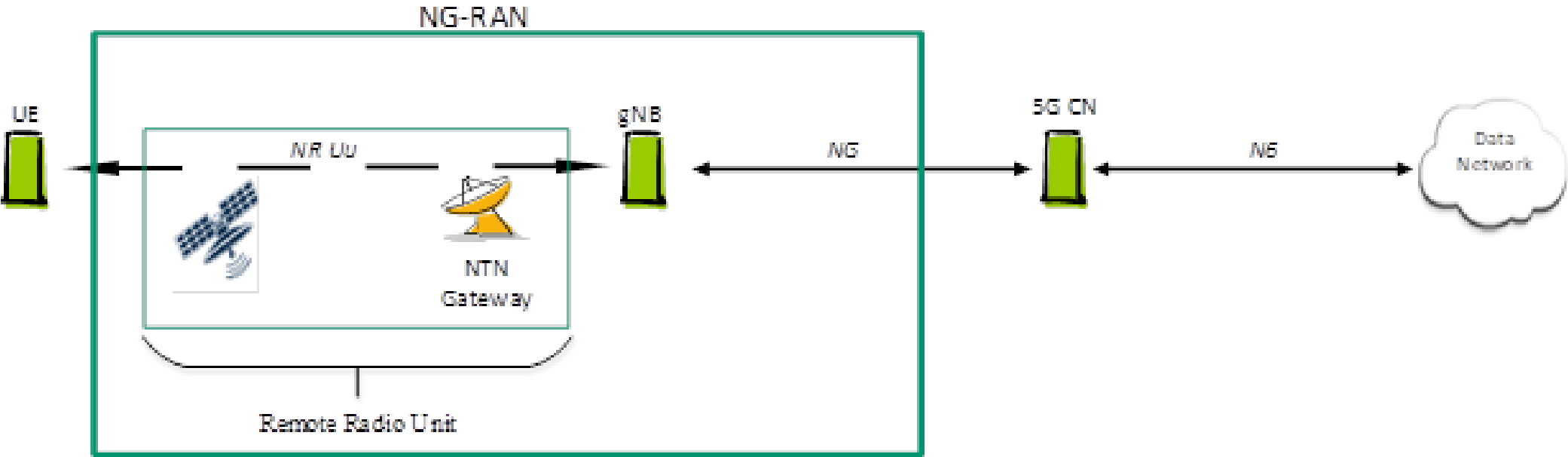
# Satellite NTN typical scenario based on transparent payload



# Satellite-based NTN typical scenario based on regenerative payload

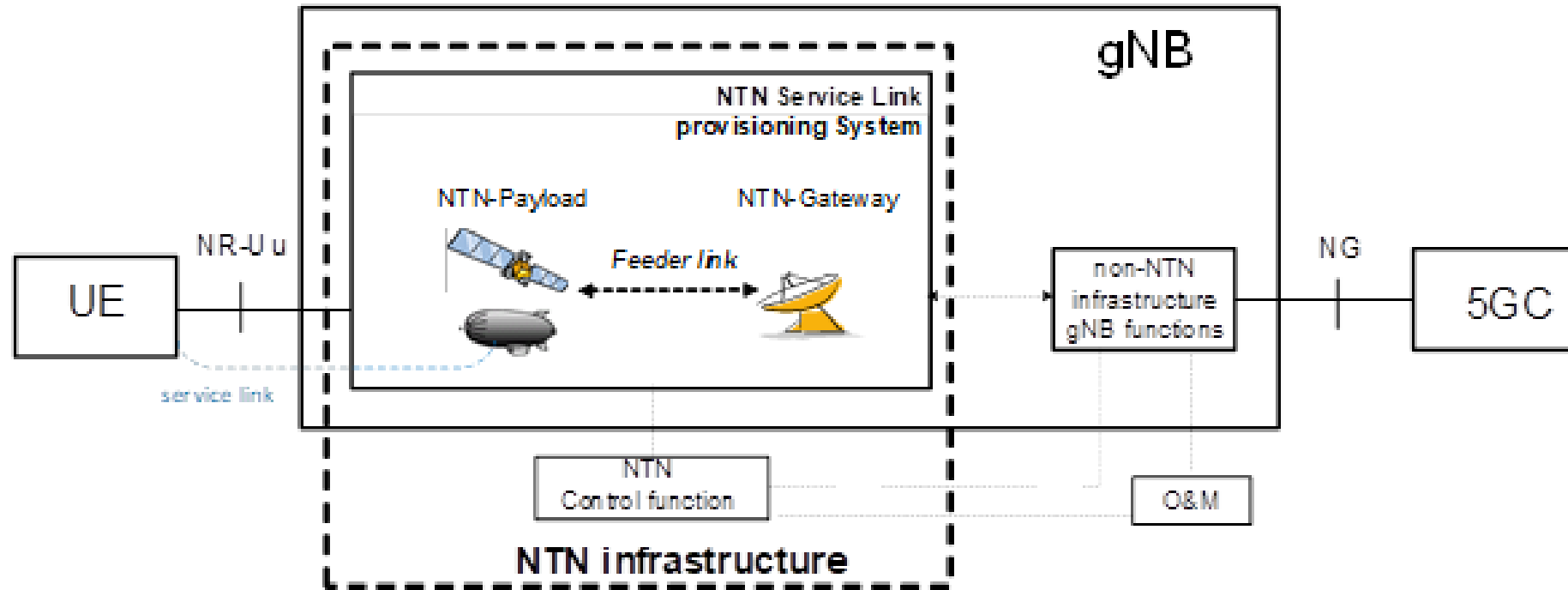


# Networking-RAN architecture with transparent satellite

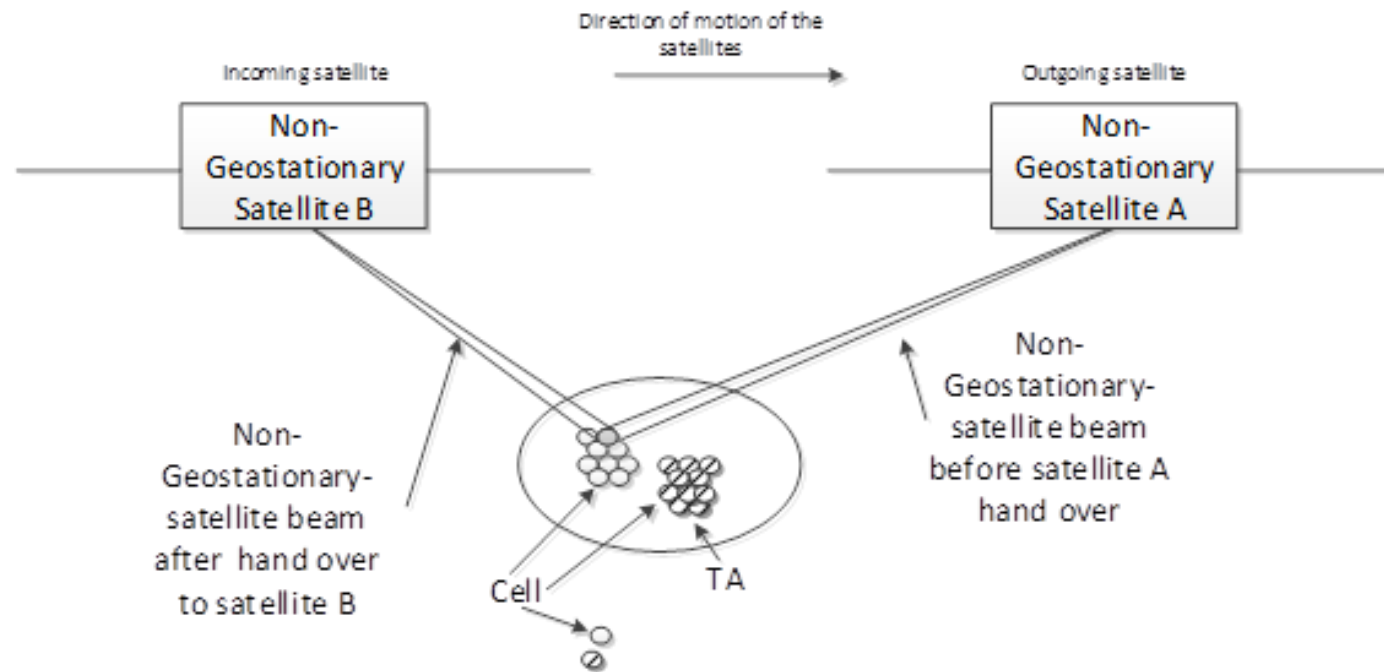




Satellite payload + feeder link + GW + Non-NTN infrastructure gNB



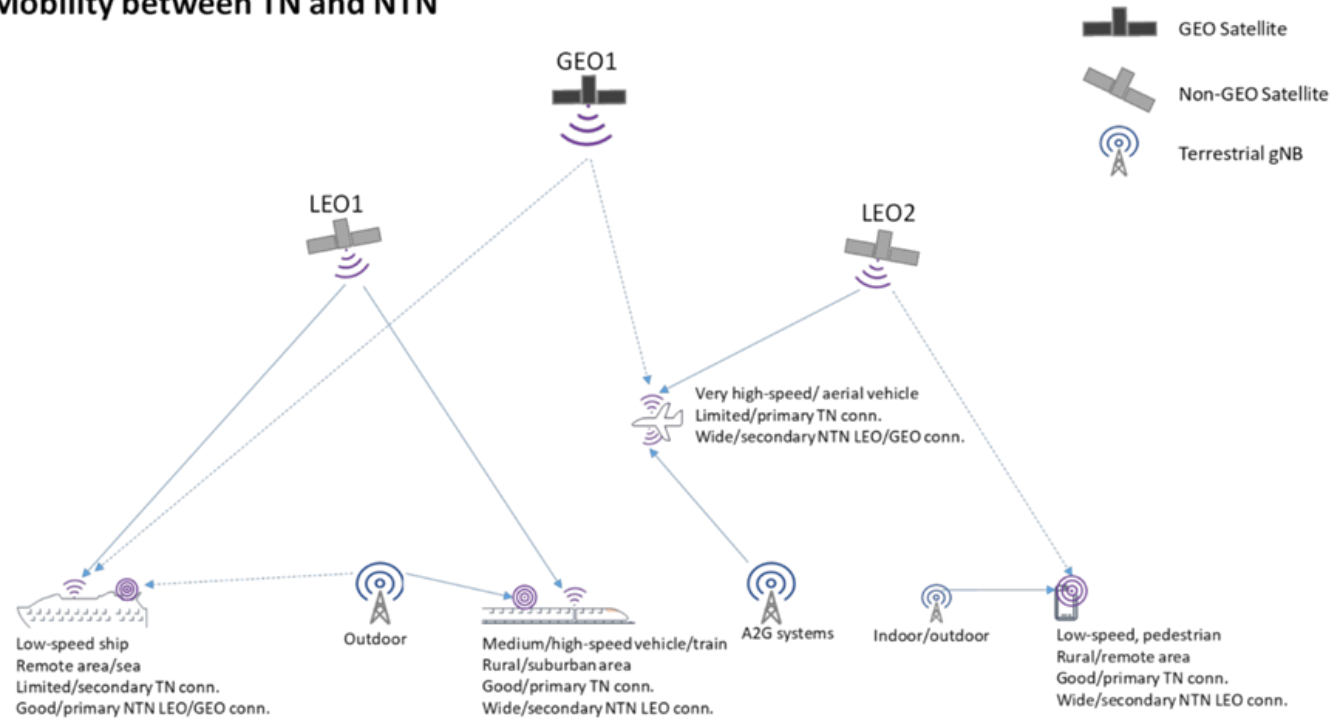
# Non-Geostationary Satellite Beam steering and Handover



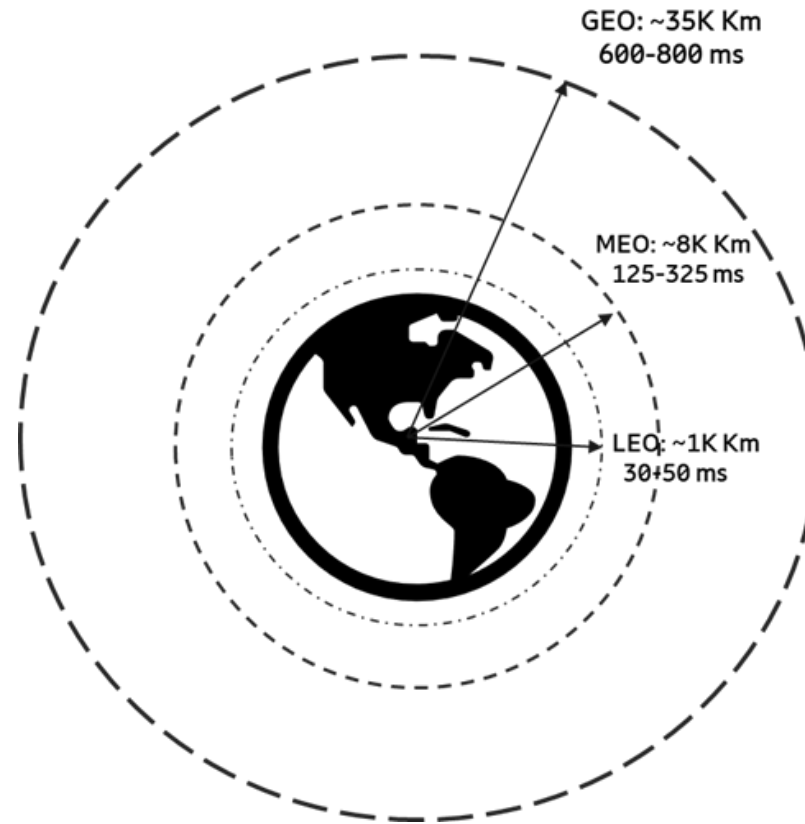


# Typical example of NTN-TN interworking

## Mobility between TN and NTN

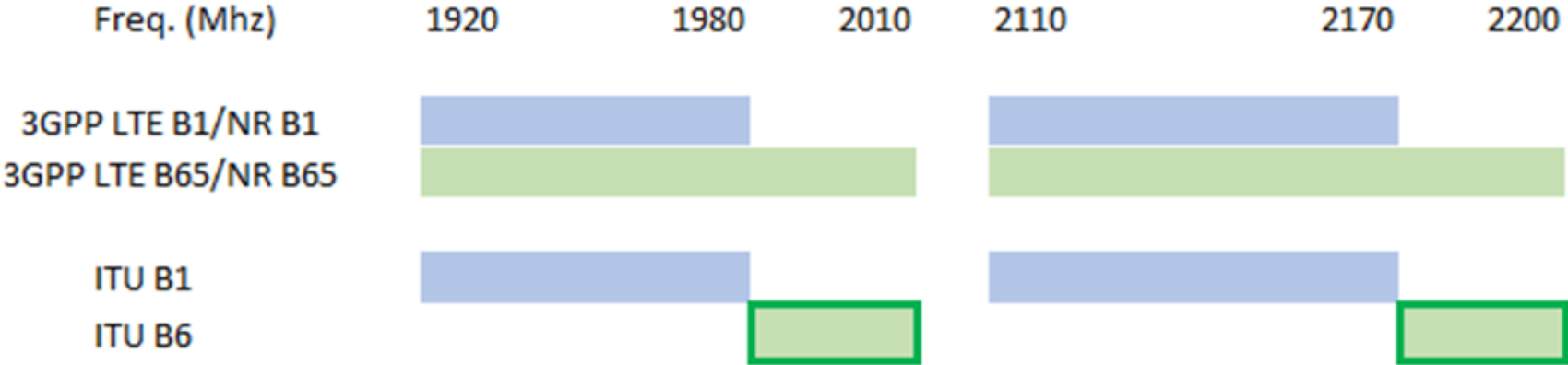


# LEO, MEO and GEO satellite altitudes and latencies

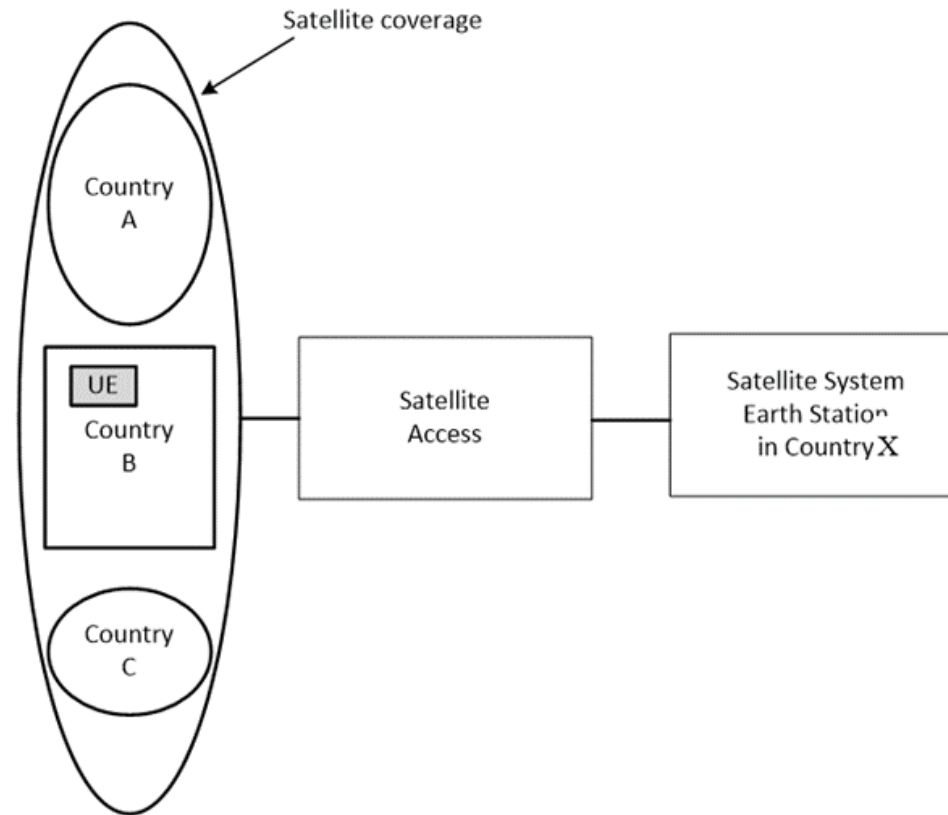




# 3GPP-identified frequencies for use by satellites in NTN's



# Satellite access with satellite beams overlapping several countries





# Satellite access with satellite beams overlapping several countries

