



# Future Benefits of Satellite – Case Studies

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# Agenda

- Innovations in Satellite Technology
- Satellite Use Cases



# Building Blocks of Transformation

Spacecraft  
Innovation

Constellation  
Innovation

Ecosystem  
Innovation

Service Model  
Innovation



**INTELSAT.**

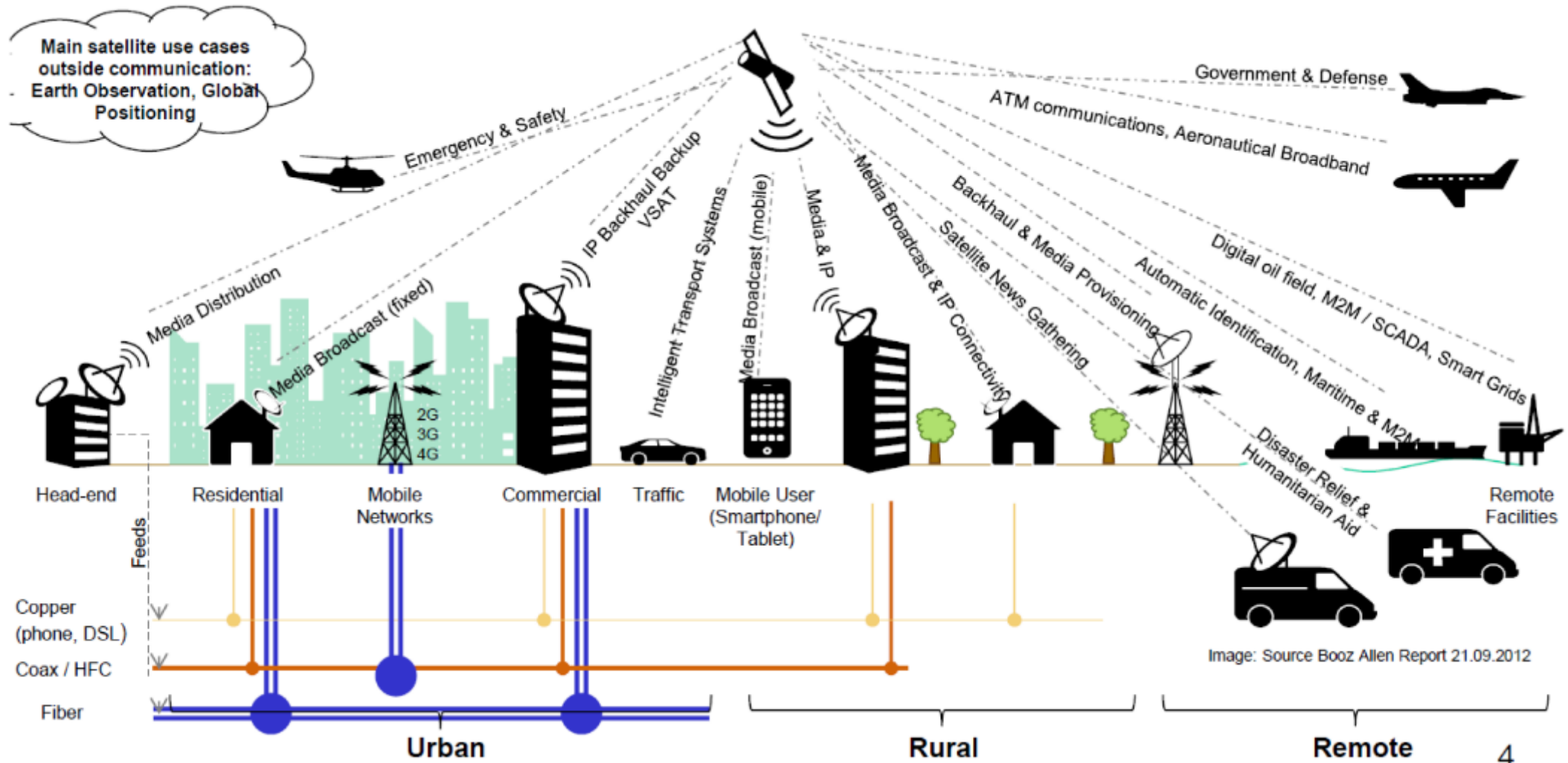
*Envision. Connect. Transform.*

A satellite is shown in orbit above Earth. The satellite has a central body with several large, dark, rectangular solar panels extending outwards. There are also several circular antennas or sensors mounted on the satellite. The Earth's surface is visible below, showing clouds and landmasses. The background is the dark void of space with some stars.

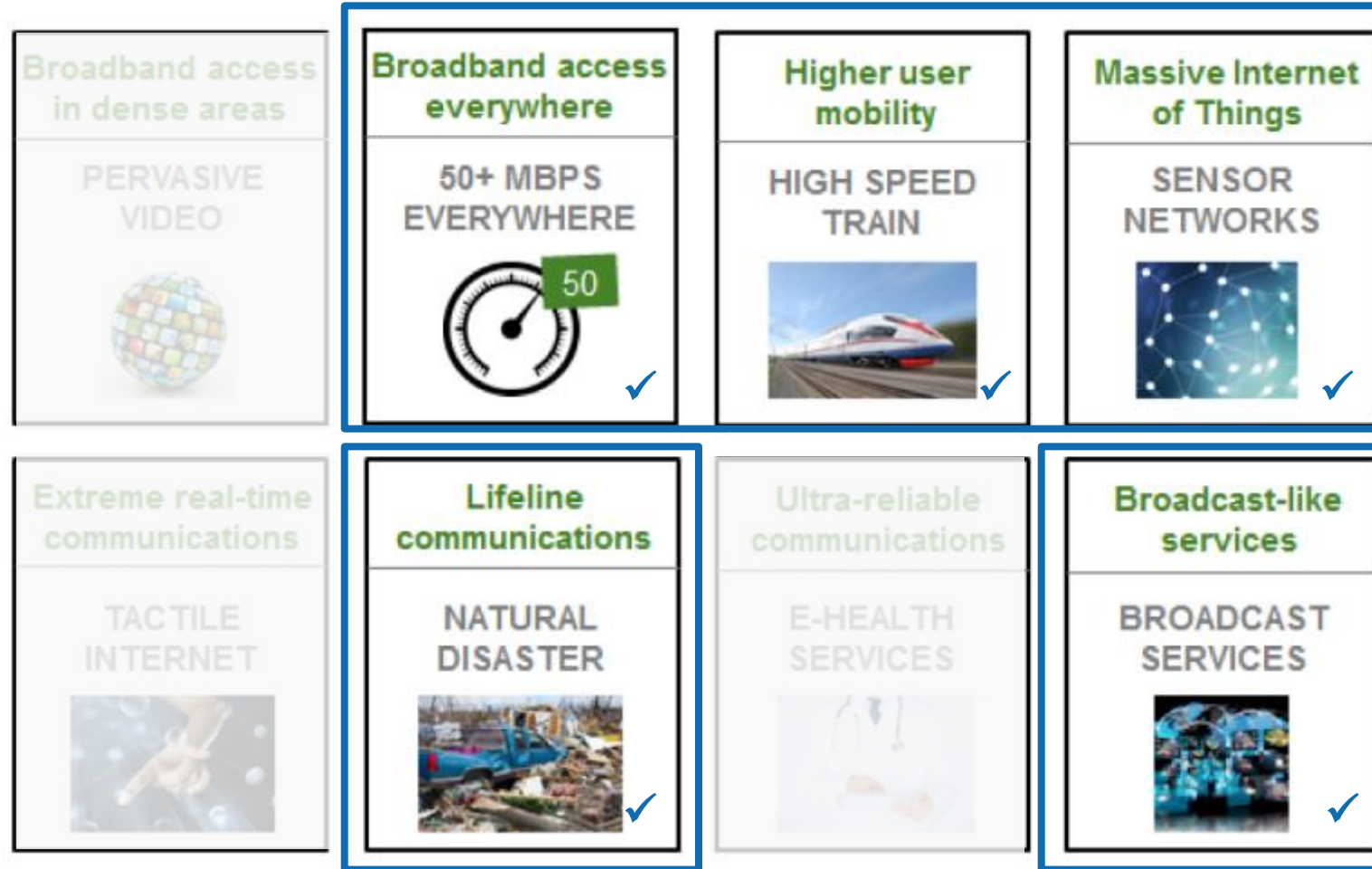
# Satellite Use Cases



# Satellite Uses



# Where does Satellite Fit in to 5G?



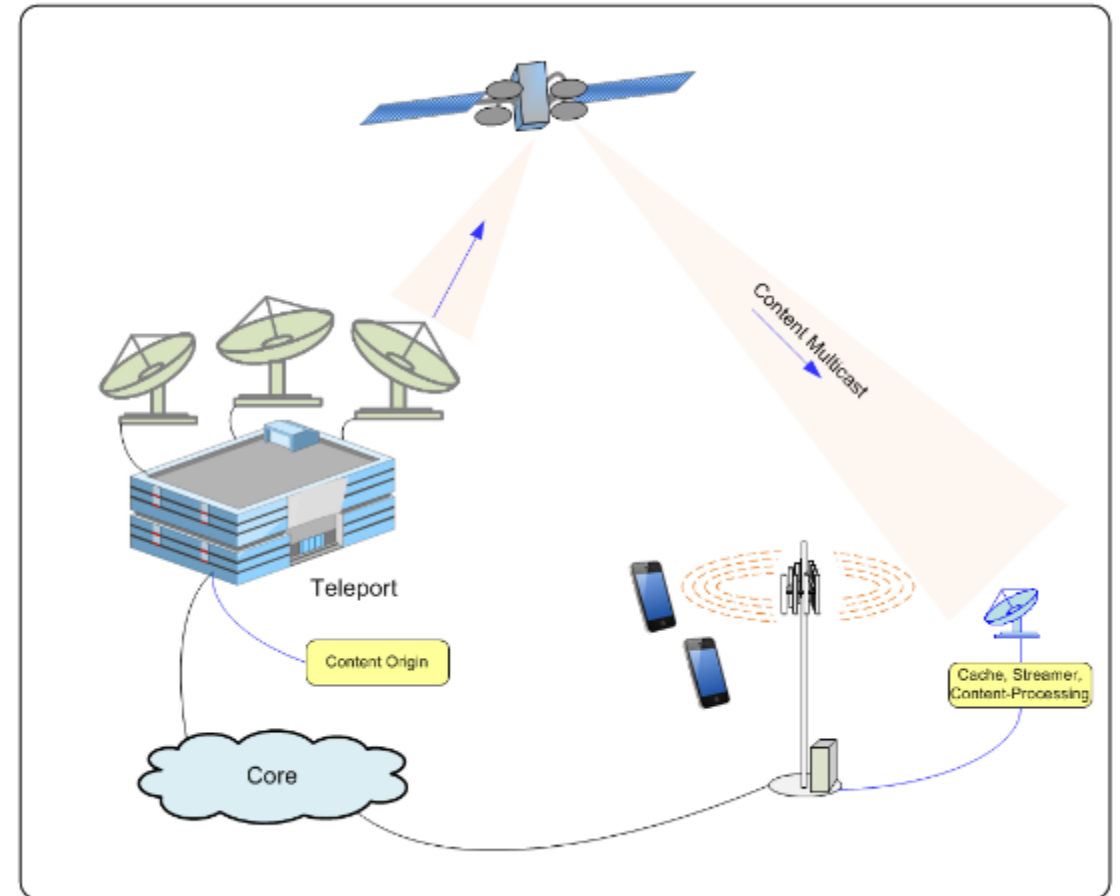
✓ = Requires or benefits from Satellite

Source: 5G Use Case Families, NGMN 5G White Paper 2015

# Use Case 1: Content Multicasting over Satellite



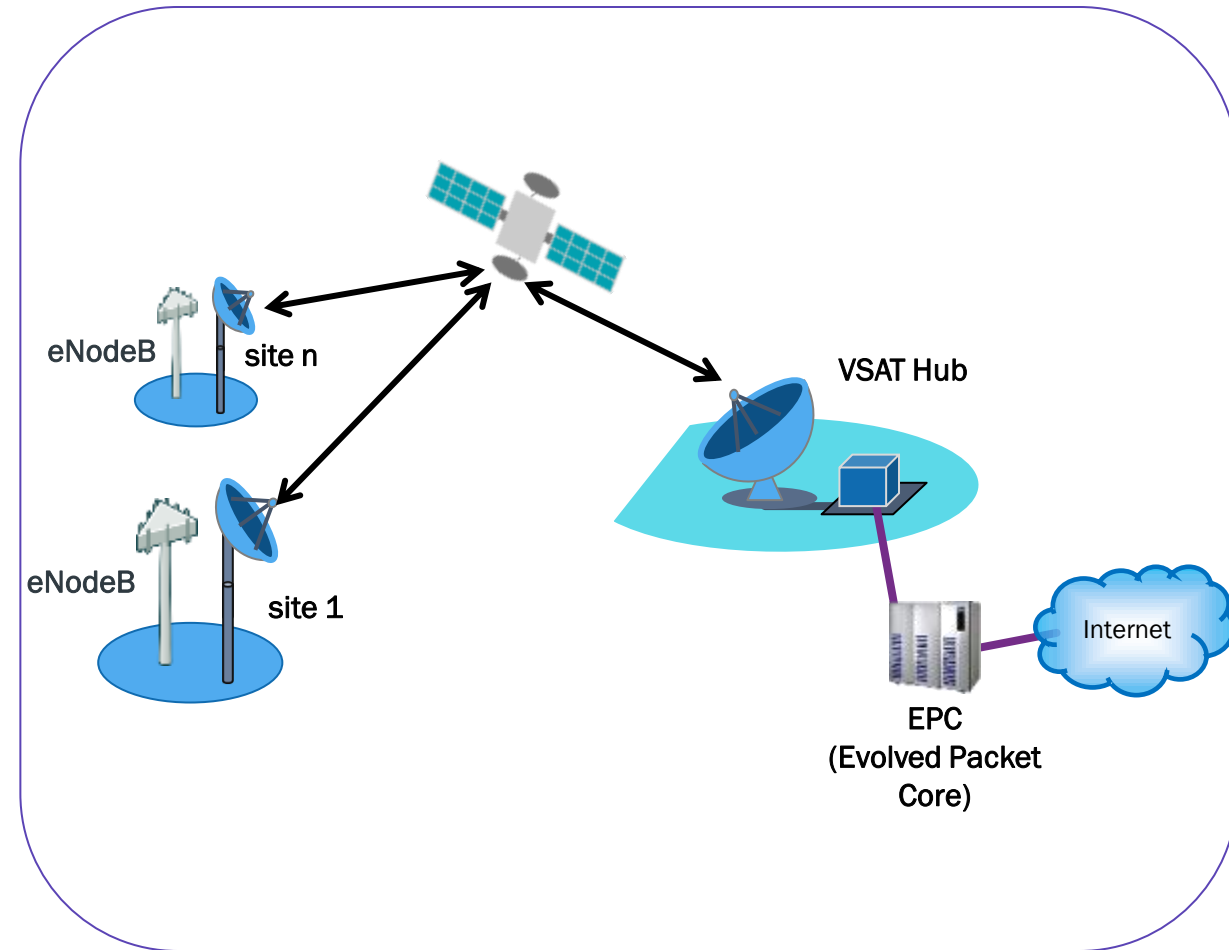
- **Problem:** A flood of requests for the same popular media content causes a surge in unicast requests that congests backhaul networks and results in a sub-optimal experience for all end-users
- **Satellite's Role:**
  - The same content can be multicast to an unlimited number of towers across a wide geographical area
  - As a result the burden of such traffic surges can be taken off of the MNO backhaul networks
  - The benefits of satellite can be further amplified by combining with caching at the edge via MEC
- **Satellite Benefits Delivered:**
  - Facilitates eMBB
  - Cost savings for MNOs while improving 5G user experience



# Use Case 2: Cellular Backhaul



- **Problem:** Terrestrial backhaul connectivity is insufficient and/or unreliable and costly to upgrade
- **Satellite's Role:**
  - Satellites represent a pool of bandwidth that can be shared across multiple towers across a region, the pooled capacity can flexibly, cost-effectively and dynamically:
    - Provide connectivity where there is none
    - Allocate extra bandwidth to towers that need it
    - Provide DR when terrestrial networks become unusable
  - Cellular backhaul over satellite is already provided in many regions for 3G and 4G networks
- **Satellite Benefits Delivered:**
  - Facilitates eMBB and uRLLC
  - Cost savings for MNOs in deploying 5G in rural/developing regions





# World's Leading MNO on Intelsat HTS Managed Service | 2.27 Gbps

## Non-Rural + Rural

- Japan 100% coverage
- Superior performance of spot beams
- Flexibility for highly variable demand

## Network Resiliency

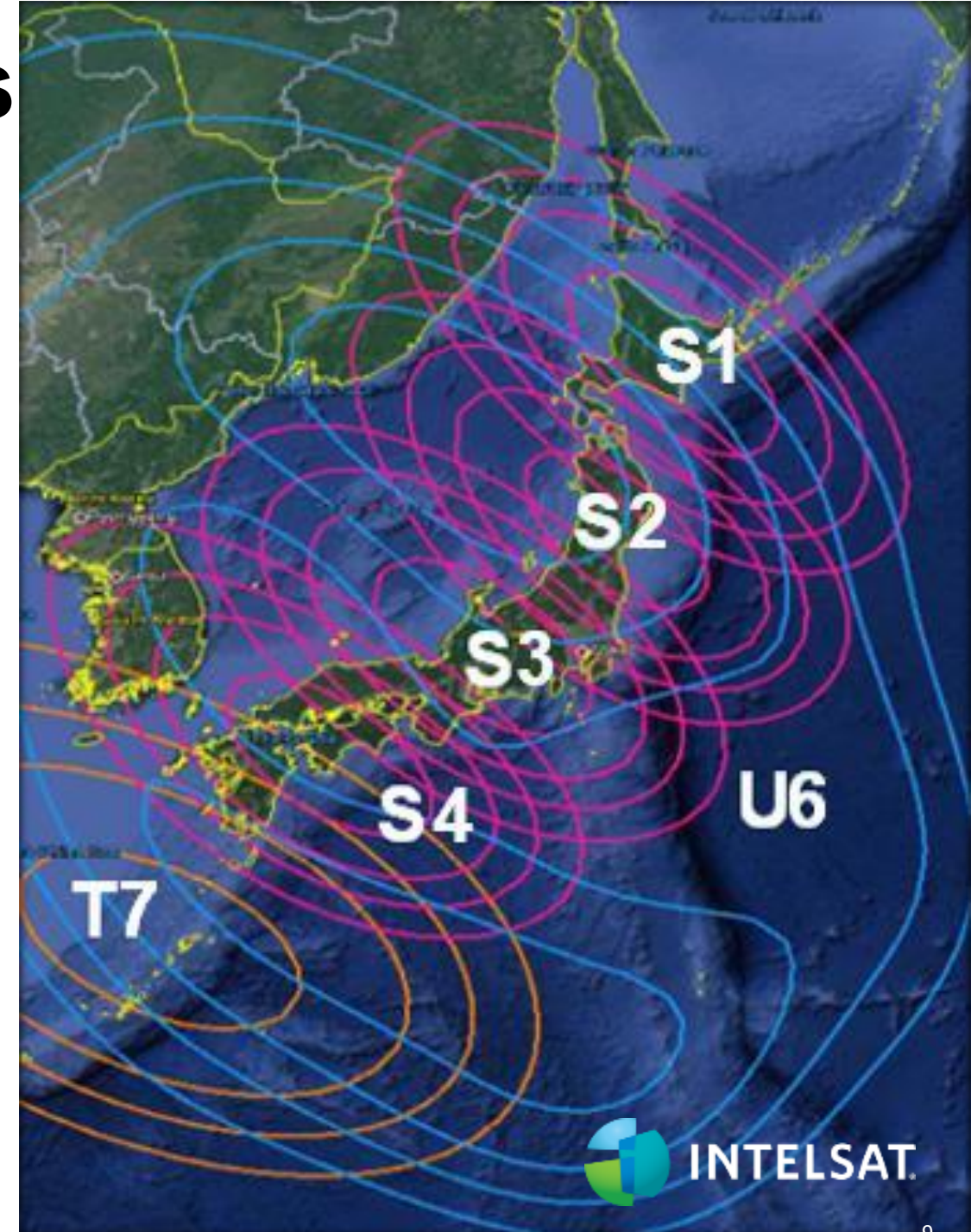
- Japan teleport infrastructure
- Fully geo redundant

## Fully Redundant operations

- Backup from US NOC

## Customization

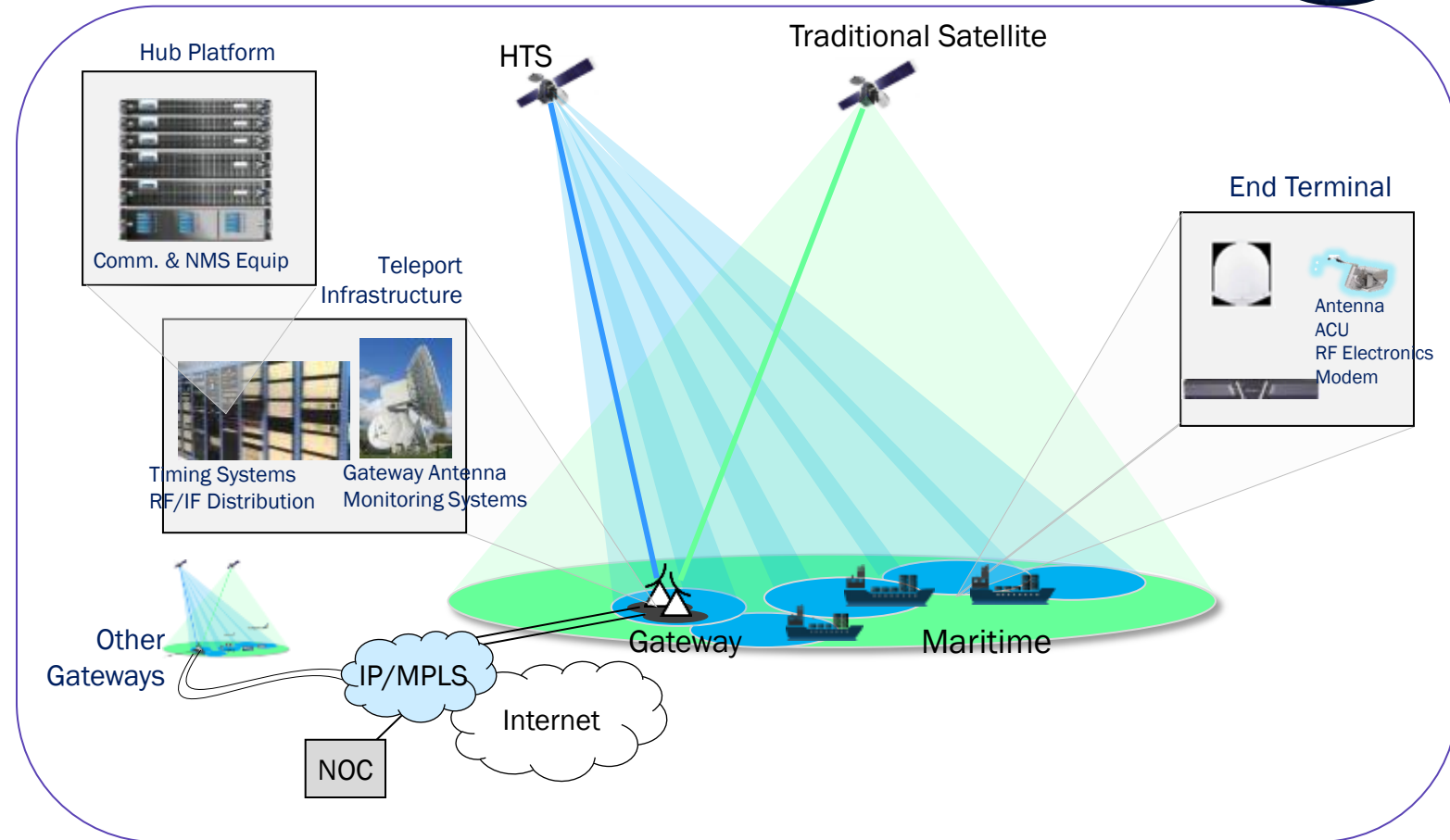
- HTS Digital payload for high QoS



# Use Case 3: Aero and Maritime



- **Problem:** Cellular towers cannot reach ships and planes en-route
- **Satellite's Role:**
  - Satellites offer high throughput broadband connectivity globally to ships and planes while en-route
  - Supports M2M, telematics, passenger Internet access, etc.
- **Satellite Benefits Delivered:**
  - Facilitates eMBB
  - Truly ubiquitous 5G user experience



# Use Case 4: Connected Car



- **Problems:**

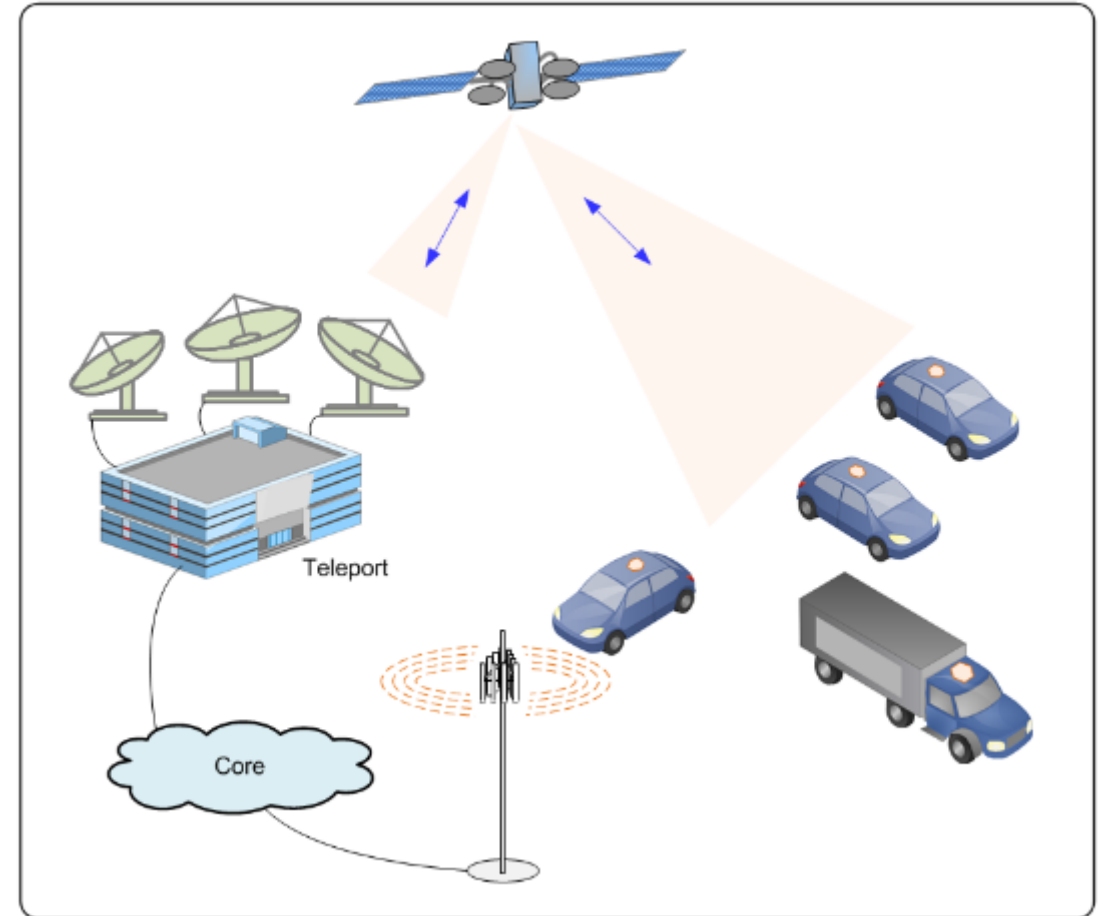
- 5G applications for connected cars become unavailable or unreliable outside of urban 5G coverage
- Same content or data being delivered to millions of vehicles simultaneously is cost prohibitive and risks congesting backhaul networks

- **Satellite's Role:**

- Pick up connectivity whenever terrestrial networks are unavailable or insufficient
- Efficiently and cost-effectively multicasts popular infotainment content, or SOTA/FOTA data files

- **Satellite Benefits:**

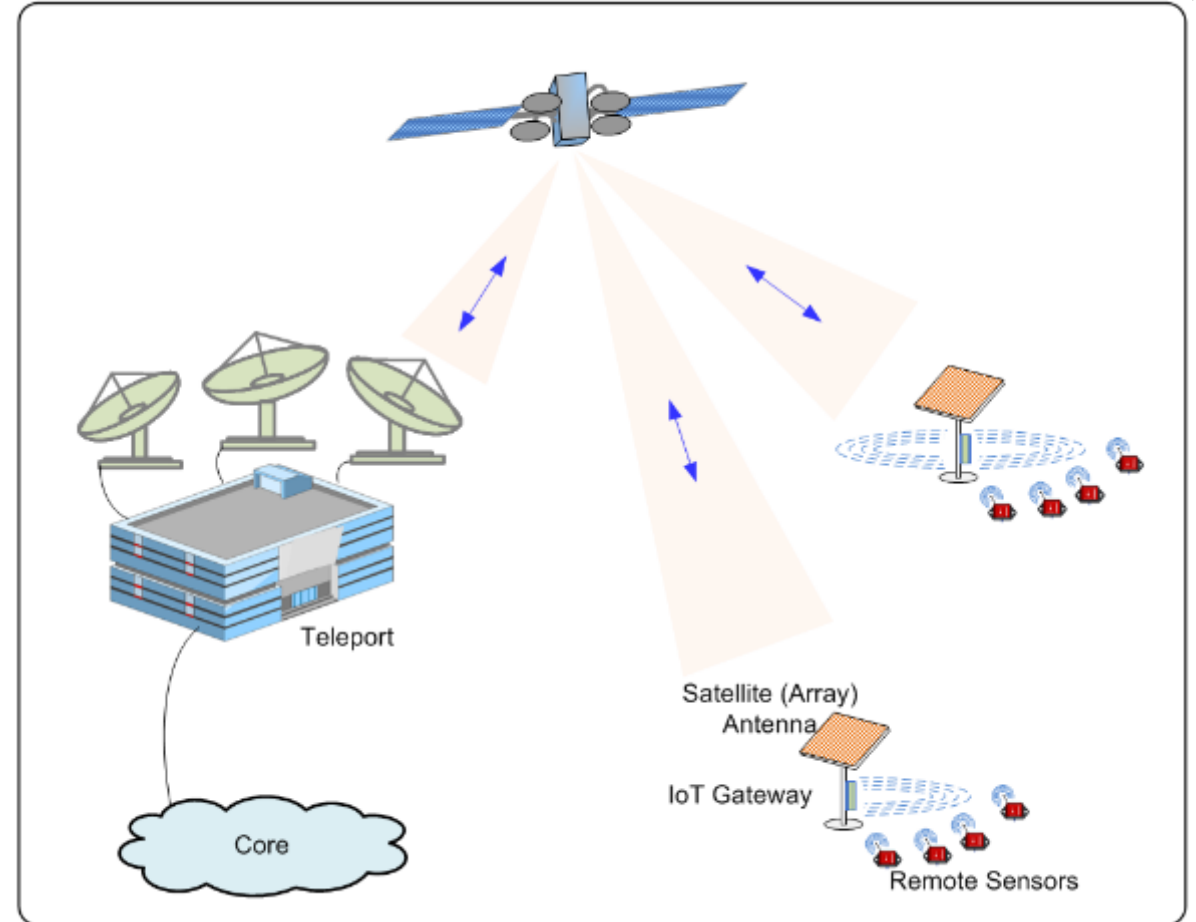
- Facilitates eMBB, uRLLC, mMTC
- Reduces costs for MNOs, auto manufacturers etc., enhances end-user experience



# Use-Case 5: IoT



- **Problem:** 5G massive IoT applications unavailable on moving vehicles and costly to implement in rural locations such as in agriculture
- **Satellite's Role:**
  - Provide extension of coverage for massive IoT for cars, trucks, buses and trains.
  - Support for 5G applications for IoT devices in rural locations without requiring costly updates to terrestrial network infrastructure
- **Satellite Benefits:**
  - Facilitates mMTC
  - Reduces costs for MNOs and IoT service providers, expands reach of 5G IoT applications







# Thank you

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