Future Networks and Convergence for Africa

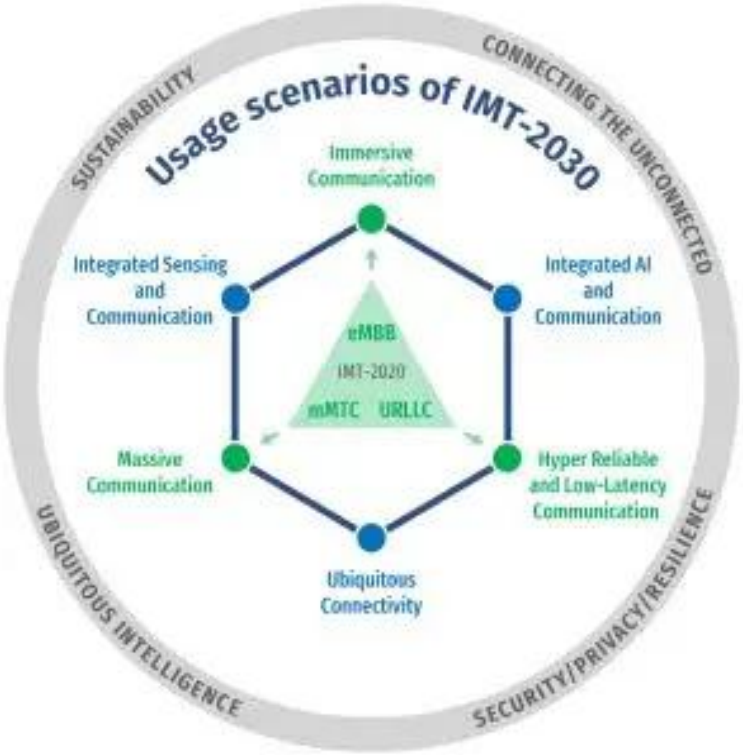
MTN Zambia's activities in

Low Earth Orbit (LEO)

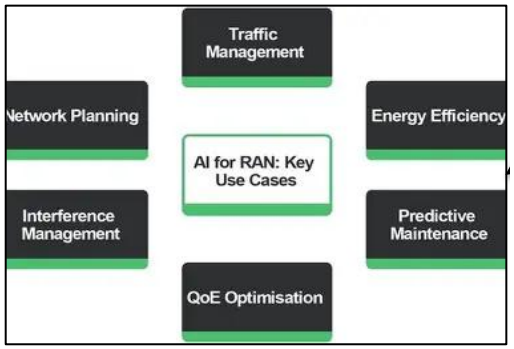
IMT 2030 and Beyond

ITU –T SG13 Design Principles

Sustainability and energy efficiency



Security and resilience
(including post-quantum readiness)

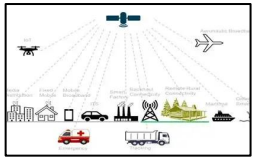
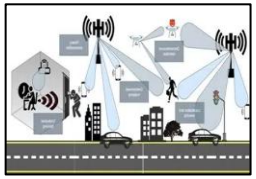


Ubiquitous intelligence
(native AI across RAN and core)

Connecting the unconnected
(deep rural, remote, and underserved areas)

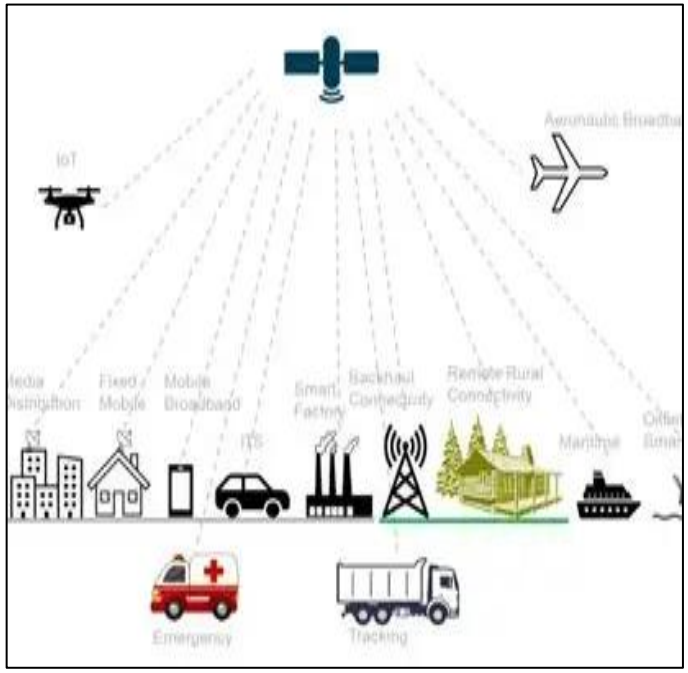
IMT 2030 and Beyond

Core Usage Scenarios

	1	**Immersive Communication (IC)** – XR, holographic telepresence
	2	**Hyper-Reliable and Low-Latency Communication (HRLLC)** – sub-millisecond critical control
	3	**Massive Communication (MC)** – extreme IoT density
	4	**Ubiquitous Connectivity (UC)** – terrestrial + non-terrestrial networks (NTN)
	5	**AI and Communication (AIAC)** – AI-native network operation and services
	6	**Integrated Sensing and Communication (ISAC)** – joint communication and sensing with the same radio signals

IMT-2030 is the globally agreed blueprint for 6G—shifting mobile networks from faster pipes to intelligent, sustainable, and ***universally accessible digital infrastructure***

Fixed-Mobile - Satellite Convergence (FMSC)

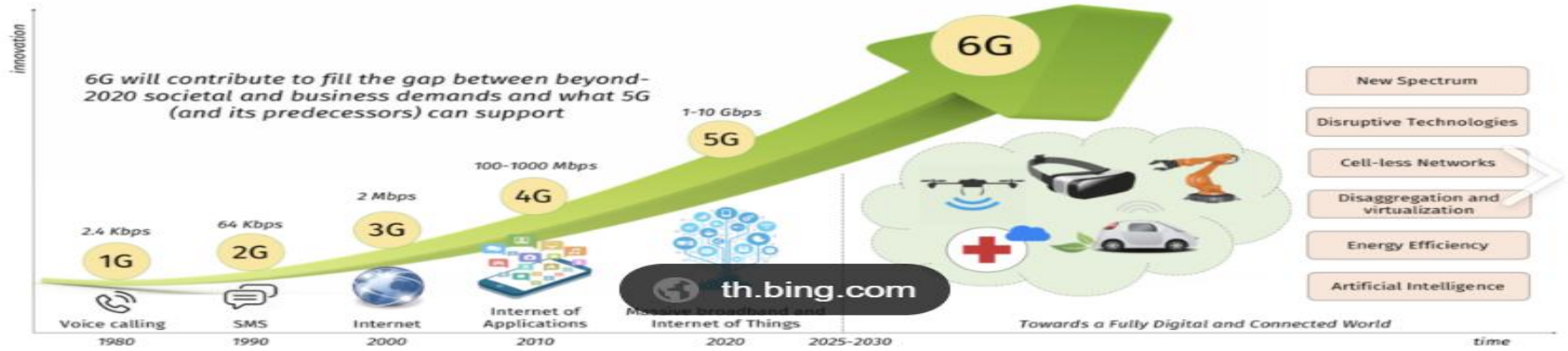


Global demand for seamless connectivity across fixed, mobile, and satellite networks

FMSC as a cornerstone of 6G and beyond
FMSC integrates fixed, mobile, and satellite networks

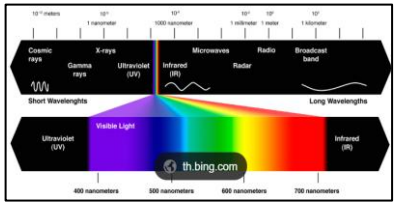
Importance of regulatory alignment for interoperability and fair access.

Demand for universal, resilient connectivity.



ITU-T standards (Y.3201, Y.3202, Y.3207) guide development.

FMSC Regulatory Considerations



Spectrum harmonization across TN/NTN

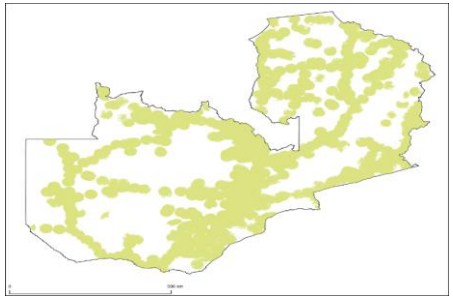
Licensing models for hybrid operators

Cross-border coordination for satellite footprints

Security & privacy across heterogeneous networks

- ✓ Encourage public-private partnerships.
- ✓ Develop flexible licensing frameworks that cover both terrestrial and satellite.
- ✓ Promote international collaboration on spectrum and orbital slots.
- ✓ Establish clear security and resilience guidelines.
- ✓ **And support pilot projects to test FMSC in rural and remote areas.**

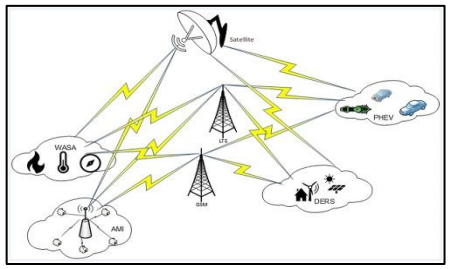
Why Accelerate FMSC Policy adoption in Africa



Digital inclusion: rural and underserved connectivity

Resilience: disaster recovery and continuity

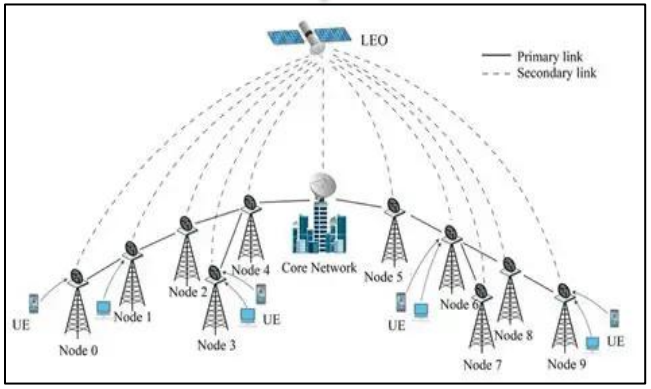
Economic growth: IoT, smart cities, commerce.



Innovation: aviation, maritime, autonomous systems.

MTN Zambia Hands on Experience With LEO

2023

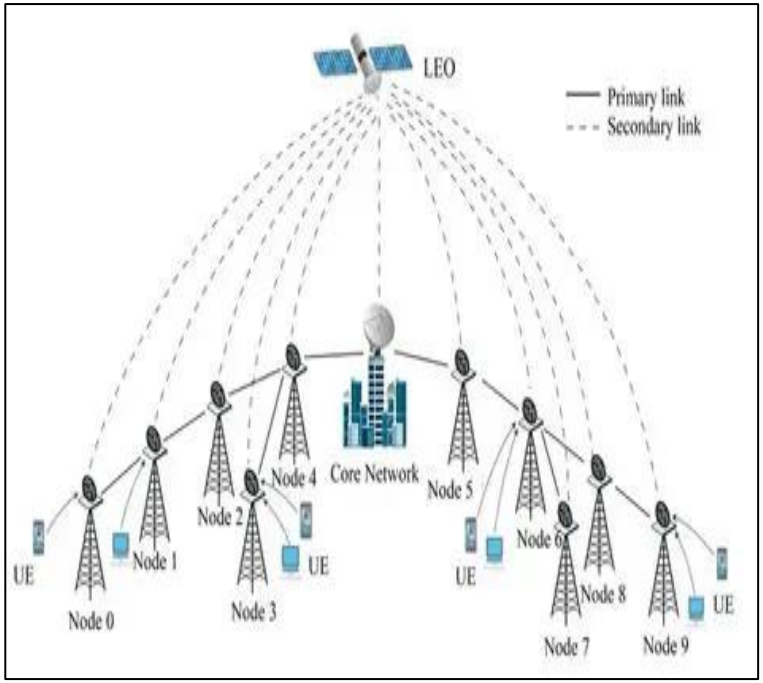


LEO for Mobile site Backhaul
LEO for Mobile Site Backup link

2026

Direct to Cell (D2C) POC

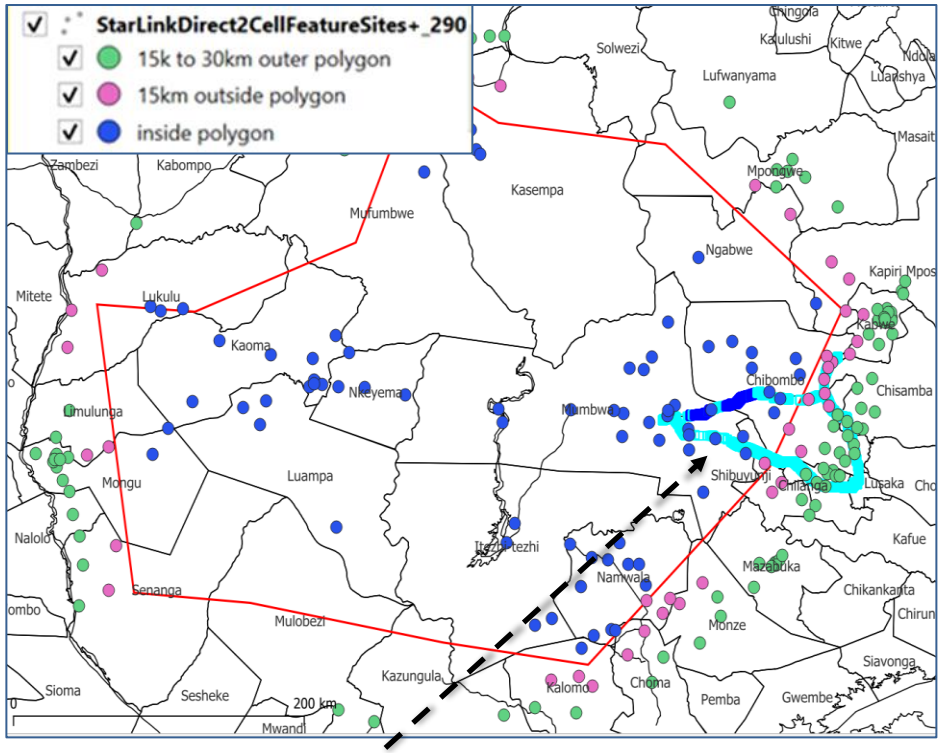
MTN Zambia 1st User Case – LEO For Backhual



- ✓ Improved backhaul capacity and performance compared to VSAT GEO Satellite
- ✓ 4G Mobile broadband became possible
- ✓ Improved Availability on the Rural sites, no dependence on the intermediary sites
- ✓ Niche 4G deployment is now possible in remote spots such as mining exploration areas, deep open pit mines etc

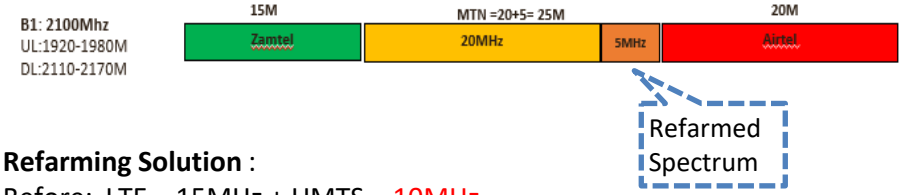
MTN Zambia D2C POC

POC Polygon, Drive Test Route and Refarming Solution



Drive test route inside and outside of the polygon

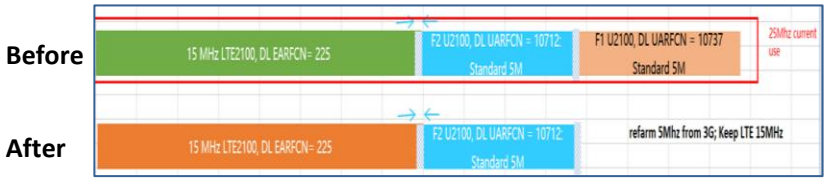
2100MHz Spectrum Usage: MTN sandwiched between Zamtel & Airtel



Refarming Solution :

Before: LTE – 15MHz + UMTS – 10MHz

After: LTE – 15MHz + UMTS – 5MHz



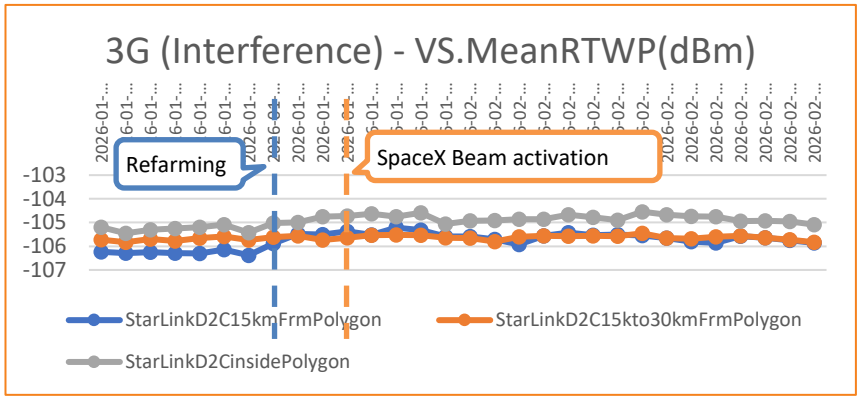
Impacted Sites :

- 78 UMTS (3G) Sites in the Polygon refarmed from 10MHz to 5MHz
- 40 Sites identified as BufferZone1 sites (15km radius) – No Refarming
- 109 sites identified as BufferZone2 sites (15km to 30km radius) – No refarming
- The 40 sites and the 109 sites have not been refarmed and they are using the same spectrum as the LEO

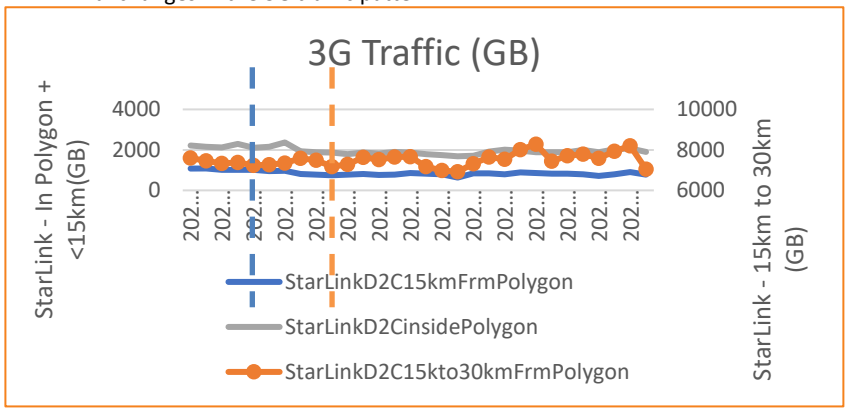
MTN Zambia D2C POC

Post Refarming and LEO activation, 3G RTWP (interference) maintained within normal threshold (-105dBm to -104dBm)

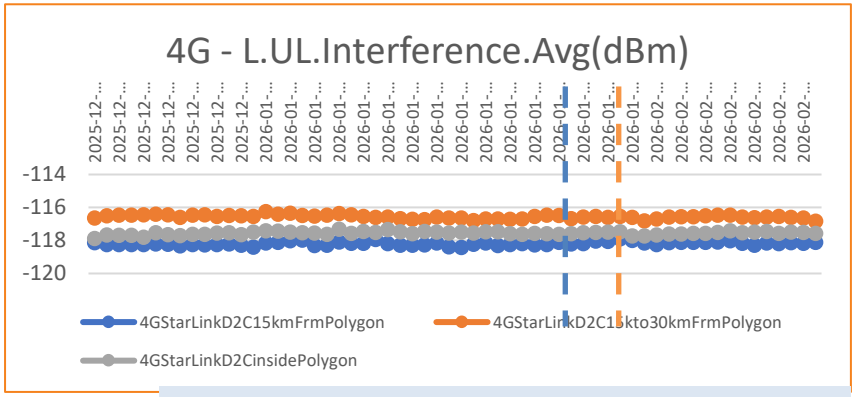
- 3G - RTWP up by 1dB to reach -104dBm but is <-95dBm threshold



- minimal changes in the 3G traffic pattern

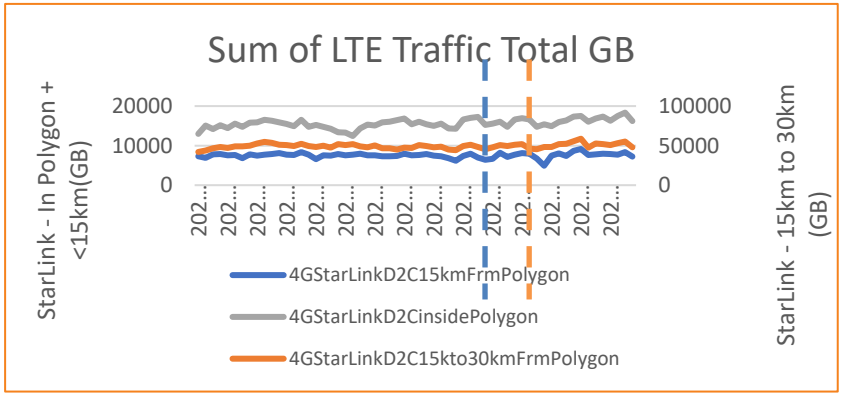


- 4G - UL.Interference is within acceptable range, < -110dBm.



4G/LTE interference post LEO activation is flat and less than -115dBm which shows no interference at all

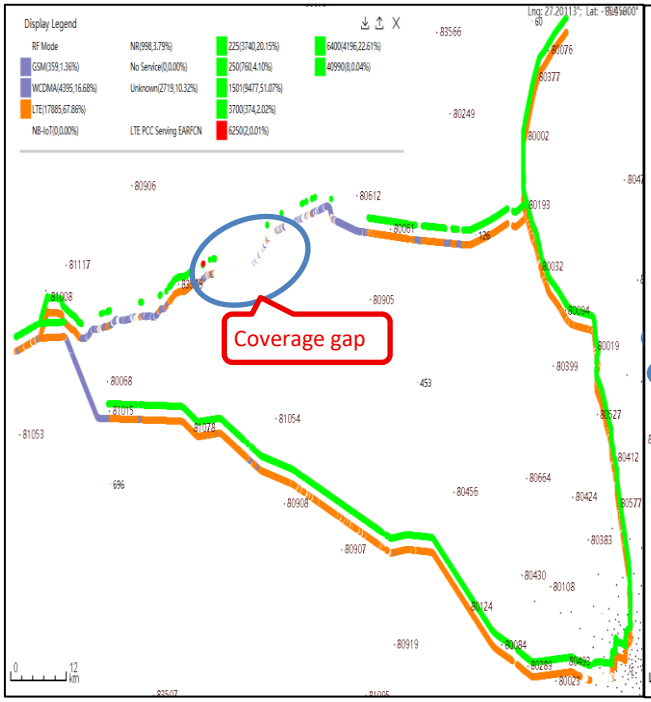
- minimal changes in the 3G traffic pattern



MTN Zambia D2C POC

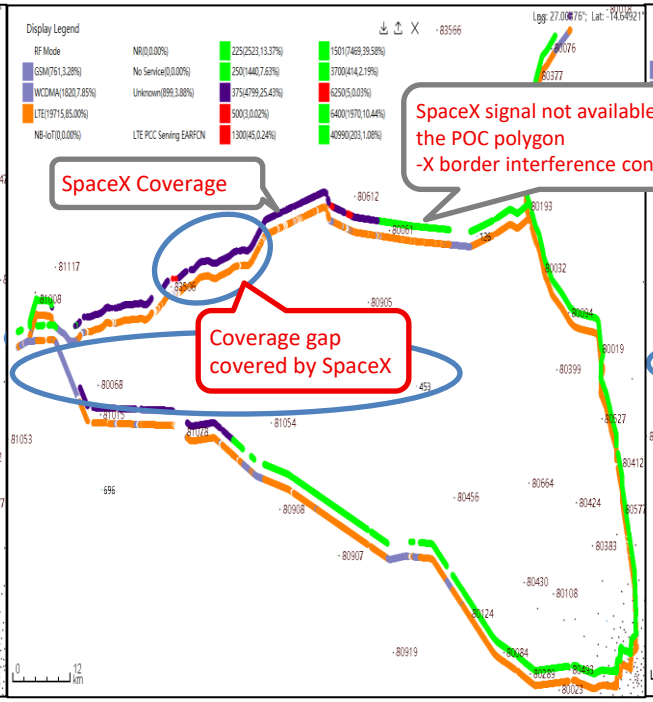
LEO successfully complimented Terrestrial coverage by closing the 10% coverage gap in the test polygon

Pre Launch DT



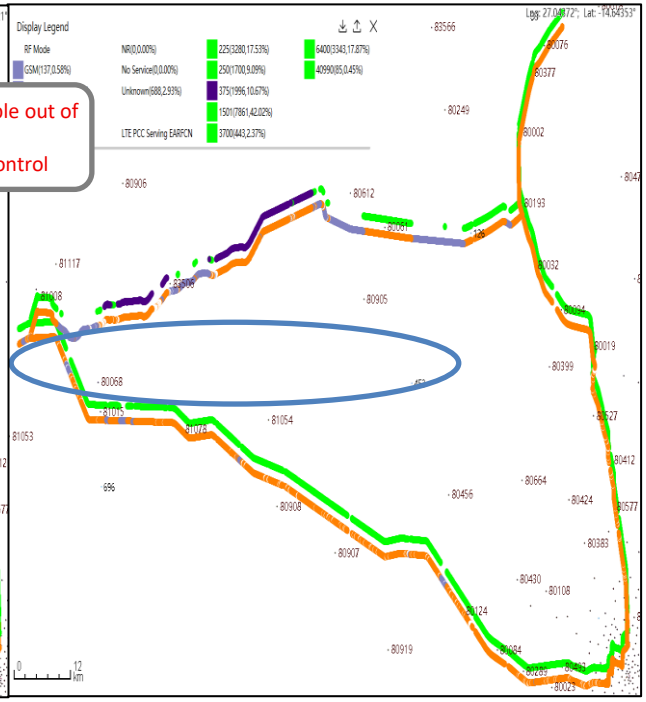
No coverage area 10%
MTN (645-02) – 90% Coverage

Post: Locked Mode DT



- No coverage area – 3%
- 3% coverage gap on LEO is mainly due to mobility tests
- LEO designed for stationery/slow moving services

Post: Automatic Mode DT

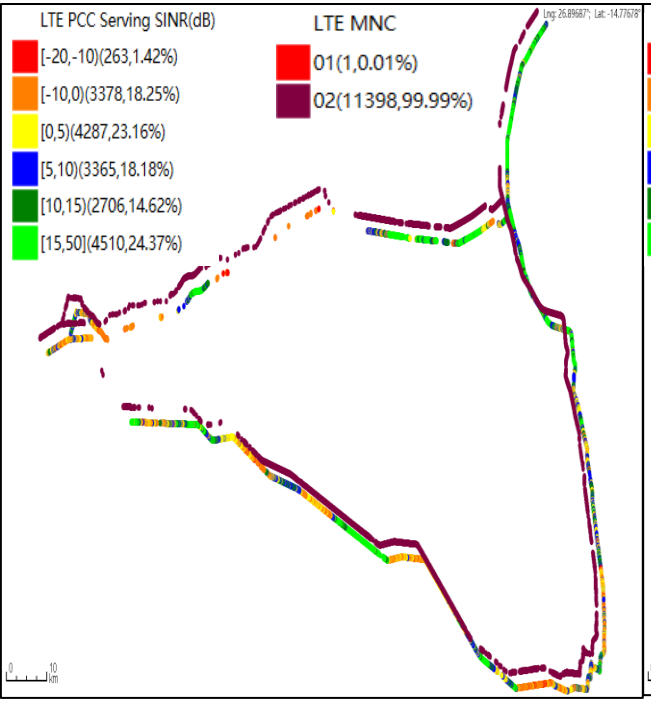


- No coverage area – 2%
- In Auto mode, device is able to switch between LEO and terrestrial networks depending on signal availability

MTN Zambia D2C POC

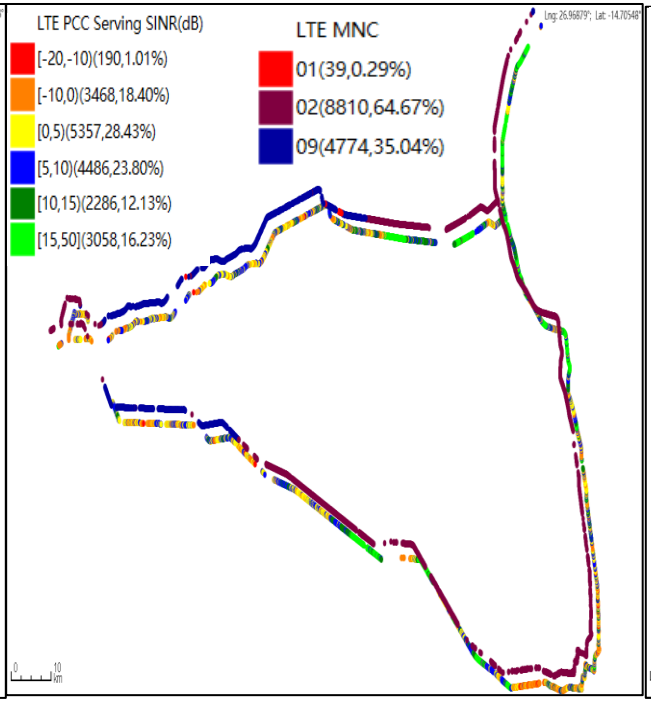
PLMN and SINR Modes: The average SINR > 5dB maintained (57%) in both Pre and Post Drive

Pre Launch DT



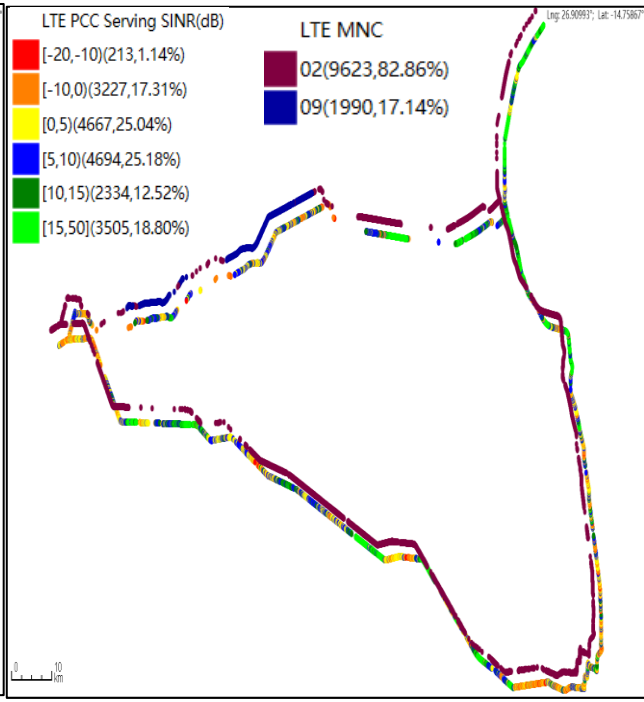
SINR >5 dB= 57.17%

Post: Locked Mode DT



SINR >5 dB= 52.16%

Post: Automatic Mode DT



SINR >5 dB= 56.5%

Results of Trial

1. Starlink D2C satellites continued coverage automatically when terrestrial network was lost
2. # of devices, # of SMSs connected – geographic area of testing
3. No instances of harmful interference
4. Successfully extended base-line connectivity (SMS and light data) – working as expected, not a substitute to high quality terrestrial connection