Satellite and Non-Terrestrial Networks Summit

NTN Broadband: coming to a place near you

Hosted by GSMA Intelligence

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Tim Hatt
Head of Research and Consulting
thatt@gsma.com
GSMA Intelligence
Who are we? What do we know?

GSMA Intelligence is the definitive source of mobile industry insights, forecasts, and research, used around the world. Our insights cover every mobile operator, network, and MVNO in every country worldwide.

BY THE NUMBERS
7/10
of Forbes’ Top digital companies worldwide, rely on our data and insights

50m+
individual datapoints covering everything from operational to economic

4,600+
networks tracked, spanning every country

9/10
of the top Telecosms in the world work with GSMA Intelligence
Speaker Line up

Marc Rouanne
DISH Wireless

Libby Barr
Avanti

Piotr Wesolowski
Deutsche Telekom

Dave Roscoe
ORBCOMM

Anirban Chakraborty
Comtech

Antonio Franchi
European Space Agency

Ken Peterman
Comtech

Frank Bogle
ORBCOMM

Tamer Kadous
Globalstar

Mat Botwin
DLA Piper, LLP

Maxime Flament
5G Automotive Association

Bee Hayes-Thakora
Kigen

Brett Tarnutzer
SpaceX

John Janka
Viasat

Natalia Vicente
GSOA

Amina Boubendir
Airbus

Richard Cockle
GSMA
Why satellite matters in 2024

IT WORKS, AND IT'S HERE

Pragmatism

• **Filling the gap.** The economics are prohibitive for extending land networks to reach the 7% of people still in a coverage gap. Satellite is the only feasible option.

• **P&L.** Satellite’s economics have made backhaul more competitive than previously. Revenue upside exists in the consumer and B2B segments.

• **Proof points.** Despite momentum, proof points remain key for product and pricing strategy.

Tapping new revenues

• **Consumers.** Revenues will come from extended roaming tariffs and new subscribers. GSMA Intelligence estimates this to reach $20–25 billion per year by 2035 (two thirds of the total satellite-enabled connectivity revenue available to telecoms operators).

• **B2B.** This is the newest and fastest growing dimension in the operator revenue opportunity. This targets IoT service to a range of industries, with a forecast of around $10 billion per year by 2035 (just under a third of the total).

Laying the groundwork for the long-term

• **NTN standards.** 3GPP standards now incorporate NTNs, vastly increasing the addressable universe of devices.

• **Fragmentation.** Risks remain if prominent hold-outs such as Starlink and Kuiper continue to pursue proprietary models.

• **Devices.** D2D service continues to be a model major companies are pursuing. However, this depends on if and when device OEMs incorporate functionality, presenting a competitive choice.
Space is (still) getting more crowded

Context and why now

- LEO constellation explosion. Total satellites in orbit will be 10x pre 2020 levels by end of decade
- Driven by improved satellite economics and performance
- Telco demand growing

Manifold use cases

- Consumer = unconnected, roaming, emergency service
- IoT/industrial sell in coming into frame across several industries
Commercial launches gather momentum

Trials and deals
2022 and 2023 was spent on trials and pilots

Shifts and launch activity
Many of these trials are still active but 2024 will see a transition to commercial launches

Burgeoning competitive landscape
- Starlink maintains a first-mover advantage. Huge forward capacity (application pending)
- However, this is a crowded field, with Amazon, OneWeb (now owned by Eutelsat) and others in pursuit

Starlink and OneWeb are the global leaders in LEO
Source: GSMA Intelligence

<table>
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<tr>
<th>Satellite and Non-Terrestrial Network Groups</th>
<th>Number of Satellites</th>
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<tr>
<td>China satellite network group (GW)</td>
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0  2000  4000  6000  8000  10000  12000  14000
China satellite network group (GW)
SpaceX (Starlink)
Kuiper (Amazon)
OneWeb
Telesat

Already in orbit
To be launched (as part of announced plans)
Consumers: extending coverage

Coverage
- It can be easily overlooked that around 7% of the world’s population still lives outside the range of a mobile network fast enough to deliver mobile broadband speeds (3G/4G)
- Africa highest (as % of pop) but still a persistent issue in parts of higher income regions (US Midwest, Europe)
- D2D impact?

Roaming
- Ubiquitous roaming tariffs are also in play
- Apple/Globalstar may presage others
- Pricing questions/options

Satellite is the only realistic means of reaching the 7% of the world outside of mobile network coverage (Million)

Source: GSMA Intelligence
Consumers: D2D accelerates the extension

How does it work?
• D2D is not new, but recharged by better tech and, crucially, NTN standards
• Typically operates at LEO altitude, but differs in several ways from traditional constellations
• Signal direct to device (handset or IoT). No requirement for dish or other receiving equipment

Why does this matter?

Cost savings + ease of integration with terrestrial network
Faster time to market
More accessible for consumers and businesses
Conduit to new revenue streams
B2B: IoT across a range of sectors

The B2B opportunity
- Newer, faster growth
- Mostly lower power (e.g. weather sensors, telematics for logistics, and monitoring agricultural operations) but slowly changing

Addressable base
Nearly 2 billion IoT devices are addressable from satellite-enabled connectivity (10% of the IoT base by 2035), though this is probably conservative

Revenue uplift
- The potential revenue uplift for IoT is $10 billion per year over the same horizon
- = 25% of the connectivity revenues associated with IoT (i.e. the revenues mobile operators make from IoT)

Sector split of the IoT base addressable via satellite, 2035

- Utilities, 26%
- Automotive (connected cars), 21%
- Agriculture, 12%
- Mining, 11%
- Manufacturing, 11%
- Oil and gas, 11%
- Healthcare, 6%
- Commercial haulage, 1%
- Shipping / Maritime, 1%

Source: GSMA Intelligence
Chipsets / devices: making satellite provision seamless

Standards integration matters

• Why? Gives underpinning for global device and chipmakers to incorporate satellite compatibility into their own portfolios
• Some device makers have longstanding support for GEO satellite services, but these have been on limited spectrum bands and at low scale, which has translated into high costs for customers

Things won’t change overnight

• Qualcomm, Mediatek, Kigen, Thales and others are updating their chipsets, and bootstrapping to make provision for satellite seamless on new devices. BUT...
• The handset replacement cycle needs to play through for people to own devices compatible with 3GPP Release 17 or later – i.e. those capable of receiving satellite service

A differentiator

• Numbers should progressively grow from now until the end of the decade
• This also implies satellite support will become a competitive differentiator. We expect to see more of this made in operator marketing for key handset launches – a category starved of innovation for years
Regional Considerations

Partnerships between telecoms operators and satellite companies now have a coverage footprint of more than 2 billion subscribers to reach

<table>
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<th>Region</th>
<th>Partnerships</th>
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<td>India, 332</td>
<td>Bharti Airtel (India); OneWeb</td>
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<td>Europe, Africa, 332</td>
<td>Vodafone; Kuiper</td>
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<td>CIS, Asia, 185</td>
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<td>Africa, 147</td>
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<td>BT; OneWeb</td>
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<td>Japan</td>
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Note: figures are number of mobile subscribers for each operator, and therefore the addressable footprint for a given partnership assuming national scale satellite coverage.

Source: GSMA Intelligence
Bottom line, $30bn+ addressable revenues are there

Total addressable
$30bn untapped, or 3% of existing telco revenue base overall

Splits
Consumer is majority but there is realistic sell-in to B2B and gov’t/military
- Consumer = 60%
- B2B verticals = 30-35%
- Gov’t = 5-10%

Business model
Primarily a wholesale play, telcos own customer relationship

Addressable telco revenues via wholesale sat partnerships ($ billions)
Source: GSMA Intelligence
Where do we go from here?

Making the science non-fiction

**Technology**
- **Network performance:** does it get beyond ‘3G-like’?
- **Satellite longevity:** does this lengthen? How long?
- **D2D:** real deal?
- **Chipsets and handsets:** how quickly is NTN integrated? How fast can people tap in?

**Partnership/ Biz model**
- **Wholesale > retail:** Does wholesale remain GTM? Is Starlink alone with retail?
- **Integration costs + set up:** how can telcos minimize opex/capex vis-à-vis NTN integration?
- **Proving the revenue story:** to what extent do these show up? Do operators disclose the NTN impact?

**Regulatory**
- **Spectrum:** interference mitigations? Borrowing terrestrial? MSS?
- **Landing rights:** getting global alignment...possible?
- **NTN standards integration...and 6G:** NTN impact with 5G-advanced and 6G?
Where do we go from here?

Global Mobile Trends 2024
Enter AI and the ‘open of everything’

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Let's have a great discussion....

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Tim Hatt
Head of Research and Consulting
thatt@gsma.com