

Telecoms in 2025: Trends and Innovations Shaping the Digital Landscape

DATE

January 2025

GSMA Intelligence

Who are we, what do we do, and 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.

COMPREHENSIVE DATA PLATFORM	INSIGHTFUL RESEARCH	EXPERT ANALYSIS	BESPOKE CONSULTING	EVENT SUPPORT
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Who we work with

 Mobile Network Operators	 Regulatory Bodies	 Government Departments	 Financial Corporations	 Cybersecurity Firms	 OEMs and Manufacturers	 Technology Companies	 Consulting Businesses
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The collage features several key components: a report titled 'The 5G FWA opportunity: A TCO model for a 5G-Ready FWA network'; a report titled 'Analysing the behaviour of early 5G users: 10 things to know when planning consumer 5G'; a dashboard for '5G Infrastructure 47.97' and '5G Services 40.62' with various metrics and charts; a 'CUSTOM SEARCH' interface with filters for 'By Operator', 'By Market', 'By MVNO', 'Operator List', 'Network List', and 'MVNO List'; and a 'Spectrum Portfolio' dashboard showing 'MHz Total by Frequency Band Group & Organisation' with a bar chart and filters for 'Assignment Timeline', 'License Lifecycle', 'Region & Country', and 'Frequency Band'.

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

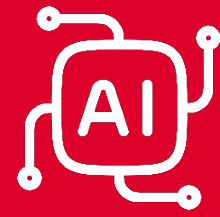
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2025 Research Themes



Network transformation

Connecting innovation to market demands



AI

Accelerating adoption and transformational impact



Digital industries

Capturing the B2B opportunity in the enterprise digital transformation era



Consumer 5G

Turning adoption into monetisation



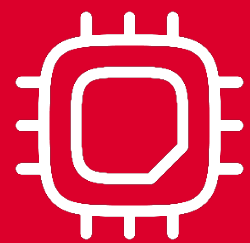
Fixed broadband and 5G FWA

Capitalising on network and service innovation



Consumer technology

Reshaping value through device and service innovation



eSIM

Seeking scale in smartphones and IoT



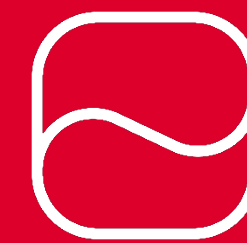
Satellites and NTN

Moving from network building to commercial momentum



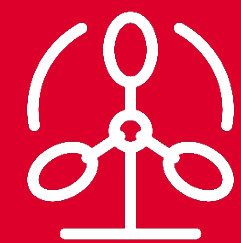
Mobile impact

Scaling the digital economy through the reach of mobile and regulatory reforms



Spectrum

Maximising value through effective management



Energy efficiency and circularity

Advancing sustainability practices in telecoms and beyond



Network transformation

Connecting innovation to market demands

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2025 areas of focus

- **Operators and network agendas** Network strategies and technology priorities; investment plans and associated capex; 5G network evolution; advancements in network energy efficiency; 2G and 3G network sunsets; VoLTE and VoNR rollout.
- **New network technologies** Progress with and impact of network APIs, open RAN, network/cloud integration, edge computing, genAI and wider AI technology, private networks, RedCap and more; operator priorities and deployment challenges.
- **5G network evolution** Rollout of 5G standalone (SA) networks beyond pioneering operators; early launch of 5G-Advanced networks, associated network capabilities and priority use cases; 6G planning and messaging.
- **Network APIs** Progress with commercialisation and use cases; footprint expansion; players driving momentum; new developments in the supply chain; supply versus demand dynamics.
- **Fixed broadband networks** Investment in fibre rollout; next wave of 5G FWA network launches; new fixed network developments such as FTTR, gigabit networks and use of AI technology; sunsetting of legacy copper-based networks.

\$180bn

Mobile operator capex in 2025 globally (\$1.1 trillion cumulative during 2025–2030)

57

Number of operators that have launched 5G SA networks as of Q3 2024 (88 have announced plans to launch, bringing the total to 145 across 63 countries)

74%

Operators, representing 74% of total mobile connections globally, have committed to the GSMA's Open Gateway initiative



AI

Accelerating adoption and transformational impact

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2025 areas of focus

- **AI at large** Developments in genAI and wider AI across networks, platforms, services and devices; companies driving momentum; AI tech innovation roadmap; competition and partnership dynamics; policy/regulation perspective.
- **AI in telco** State of deployment and adoption in networks (core and RAN), customer care and service personalisation, and operations; best practices; operator strategies, plans and expectations; opportunities and deployment challenges; operator AI readiness and maturity benchmark.
- **AI in devices and digital services** Tech roadmap and use cases seeing greatest innovation; companies driving progress and their approaches to AI monetisation; AI impact on customer experience.
- **Enterprise adoption of AI** State of adoption and enterprise views on the importance of AI for digital transformation; enterprise spend on AI and vertical sectors and countries leading investments; enterprise AI use cases and business impact areas; benefits and deployment challenges.
- **Consumer adoption of AI** Consumer interest in and use of AI applications; consumer behaviour for genAI across areas such as awareness, frequency of usage, satisfaction or dissatisfaction with existing services, and activities set to benefit the most.

74%

Share of operators that have either commercially deployed or are testing genAI solutions

33%

Share of enterprises undertaking digital transformation that are already making advanced use of AI technology (average of genAI and wider AI)

75%

Share of consumers who are aware of genAI (of these, 59% are users and among users, 67% are satisfied with their experience)



Satellites and NTN

Moving from network building to commercial momentum

2025 areas of focus

- **Business momentum** Developments across multiple areas such as commercial, technology and regulation; technology/competitive landscape and outlook; companies driving momentum.
- **Telco NTN footprint** Progress with satellite service commercialisation; markets and regions driving momentum; network coverage; partnerships between telecoms operators and satellite companies; operator commercial strategies to monetise satellite services.
- **Telco-satellite integration** Shift from the technology to the business/commercial stage; value of satellite in bridging mobile network coverage gaps and supporting IoT use cases.
- **Satellite for IoT** Developments in standards and specifications; companies driving momentum; progress with commercial solutions that integrate mobile IoT with satellite network services; new devices, form factors and use cases; competition and partnership dynamics.
- **Implications at large** Implications of satellite momentum and commercialisation on devices, chipset, networks, services and spectrum.

91

Number of operators that have partnered with satellite players to offer satellite connectivity in their services

2bn

Number of IoT devices that are addressable from satellite-enabled connectivity (10% of the IoT base by 2035)

\$30bn

By the end of 2035, satellite-backed connectivity is estimated to generate more than \$30 billion per year for operators



2025 areas of focus

- **Spectrum for 5G and beyond** New 5G spectrum auctions, assignments and outcomes across low-, mid- and high- frequency bands; 5G spectrum pricing dynamics; spectrum frequencies used for 5G network launches; assessment of future spectrum needs for 5G and beyond (WRC-27 preparation work).
- **New spectrum models** New trends in spectrum assignment requirements; new approaches to spectrum fees such as assigning spectrum in exchange for connectivity, coverage and infrastructure build; local licensing; dynamic spectrum sharing.
- **Spectrum management** Efficient use of spectrum to maximise impacts on socioeconomic developments, digital economy growth and climate change mitigation; policy and regulatory implications.
- **Spectrum for verticals** Optimal approach to assigning spectrum for vertical sectors; impacts of spectrum set-asides and ineffective spectrum policies.
- **Sunsets and tech neutrality** State of 2G/3G sunsets and outlook; regional approaches; tech neutrality and spectrum migration; correlation between 5G network launches and 2G/3G sunsets; sunset implications for devices/services (e.g. VoLTE, VoNR, IoT).

100

Number of countries globally where spectrum bands that can be used for 5G services have been assigned as of September 2024

23

Number of countries globally where mmWave spectrum bands have been assigned as of September 2024

42 & 58

Number of 2G and 3G networks (respectively) that will be shut down during 2025–2030 based on operators' announced plans



Energy efficiency and circularity

Advancing sustainability practices in telecoms networks and beyond

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2025 areas of focus

- **Energy in networks and beyond**
Enhancements across telco networks (mobile and fixed), computing and data centres; energy implications of shifting 4G and 5G workloads to the cloud and edge.
- **Enablement effect**
Mobile and digital technology implementation strategies to decarbonise vertical industries; decarbonising compute through architecture improvements at the chipset, edge and cloud data centre levels of the value chain.
- **Circular economy**
Advancements in devices and networks; supply-chain efforts to design reusable products; development of secondary markets for metals recycling and trading; operator strategies and practices for the circular economy; consumer behaviour for preowned refurbished smartphones (e.g. interest and drivers and propensity to pay).
- **Net zero progress**
Telecoms industry progress and drivers; outstanding barriers that could hold back progress towards net zero by 2050.
- **ESG evolution**
Shift to common reporting KPIs; impact on external reputation from different stakeholders (e.g. staff, suppliers, investors, regulators).

70%

Share of operators that see sustainability as a 'very' or 'extremely' important network transformation priority

1%

Percentage of global energy use attributed to operator networks (fixed and mobile)

50%

Operators accounting for 50% of global market share have committed to net zero



Digital industries

Capturing the B2B opportunity in the enterprise digital transformation era

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2025 areas of focus

- **Digital transformation of industries**
Progress with enterprise digital transformation across vertical sectors and countries; enterprise digital transformation objectives, needs, priorities and spend; technology supplier decisions and drivers behind it; use of technologies and deployment challenges.
- **Technologies enabling digital transformation**
Developments in cloud, edge, genAI and wider AI, IoT, cybersecurity, network APIs and more; security landscape and innovation; competition and partnership dynamics.
- **5G and private networks for enterprises**
State of the market; operator versus end-user views on future demand, use cases, benefits and deployment challenges; vertical sectors leading growth in demand; spectrum implications.
- **Operator B2B strategies and monetisation**
Strategic objectives and value propositions; speed of B2B revenue growth and future opportunities; technologies and services driving growth; innovation in connectivity and services beyond connectivity; operator B2B monetisation routes.
- **IoT**
Market size (connections and revenues) and growth outlook by region and vertical; emerging trends and drivers; operator strategies and plans; impact of new technologies such as RedCap, passive IoT, eSIM, iSIM and satellite.

10%

Enterprise spend on digital transformation as percentage of enterprise revenue during 2024–2030

\$400bn

Addressable market for operators in B2B technologies and services beyond connectivity

26bn

Number of IoT connections (cellular and beyond) globally by the end of 2025 (46%/54% split between consumer and enterprise IoT)



Consumer 5G

Turning adoption into monetisation

2025 areas of focus

- **5G adoption** Growth path for 5G mobile connections globally; markets surpassing 50% penetration and underlying drivers of success; markets and regions driving the next wave of 5G network launches and users.
- **5G user behaviour** Key changes across multiple areas, such as 5G user experience (e.g. satisfaction or dissatisfaction with 5G networks), willingness to pay more for 5G subscriptions, interest in 5G use cases and bundles, and 5G user engagement with digital entertainment and activities.
- **5G monetisation** Operator tariff and service innovation (e.g. shift to speed-based tariffs and experience-based differentiated services); impact of 5G adoption on mobile data traffic and ARPU; markets leading the way on ARPU growth and drivers (e.g. services, content, tariffs).
- **5G devices** New trends in device availability, pricing and innovation across smartphones, 5G FWA equipment and other consumer devices.
- **5G services beyond connectivity** 5G impact on service convergence and bundling; developments in consumer services that benefit from 5G such as mobile and cloud gaming, video, in-venue entertainment, XR (e.g. AR and VR), the metaverse and 5G new calling.

2.6bn

Number of 5G mobile connections globally by the end of 2025 (29% of total mobile connections)

82%

Average share of 5G users who claim 5G has met or exceeded their expectations

5%

Consumers who intend to upgrade to 5G are willing to pay 5% extra versus what they pay for their current 4G subscription



Fixed broadband and 5G FWA

Capitalising on network and service innovation

2025 areas of focus

- **Fixed broadband**
State of the market and penetration outlook; customer shifts in the access technology mix and technologies growing the most; operator strategies and commercial practices shaping growth and innovation.
- **Fixed-mobile convergence**
Shifting consumer behaviour impacting traditional quad-play bundles; new flavours of bundles that are emerging; operator multiplay strategies and propositions; commercial partnerships for digital entertainment and services.
- **5G FWA commercialisation**
Progress across multiple areas such as network and service launches, spectrum in use, and CPE availability and innovation; 5G FWA market segmentation; digital inclusion initiatives that leverage FWA; early use of RedCap technology.
- **5G FWA opportunity**
Main scenarios for customer adoption; countries leading on adoption and associated drivers; consumer interest in 5G FWA services; operator strategies and commercial practices for 5G FWA.
- **5G FWA for enterprises**
Enterprise interest in FWA as a 5G capability; vertical sectors and countries showing higher interest; operator approaches and strategies to grow 5G FWA enterprise adoption.

76%

FTTP/B share of total fixed broadband connections in 2025

139

Number of operators that have launched 5G FWA networks, across 68 countries as of September 2024

7

Number of countries that will have a 5G FWA share of total fixed broadband connections greater than 15% by 2030



Consumer technology

Reshaping value through device and service innovation

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2025 areas of focus

- **Evolution of devices** Progress with and impact of new technologies such as AI, foldables, XR, eSIM and satellite; wearables and smart home innovation; smartphone sales recovery and implications for mobile players; OEM market share changes and competitive dynamics.
- **Consumer behaviour for smartphones** Replacement rate trends and most important features driving consumer choices; loyalty to brands; sales channel preferences when purchasing a new smartphone; behaviour for preowned refurbished smartphones.
- **Digital entertainment and services** Innovation in gaming, pay TV, fintech and other digital services; shifting consumer preferences in the digital era; competition and partnership dynamics; AI implementation and impact.
- **Pay TV and video** Shifting consumer behaviour and drivers; cord cutting impact on traditional pay TV; tech and market developments; customer adoption trends; commercial practices shaping innovation and growth; state of the market and outlook for telcos and OTT players.
- **Operator strategies** Routes to monetise innovation in devices and digital services; new retail strategies; rise of digital brands and digital-first or digital-only propositions; evolution of telco bundling.

78%

Share of smartphone users who intend to replace their smartphone with the same brand (i.e. brand loyalty)

60%

Share of consumers playing digital games at least once per week

21

Number of pay-TV markets that will see a decline in traditional pay-TV connections between 2024 and 2030 (cord-cutting impact)



2025 areas of focus

- **eSIM in the consumer market**
Progress with commercialisation of eSIM devices and eSIM connectivity services; OEM and operator approaches to eSIM; eSIM- only smartphone outlook; eSIM impact on mobile market metrics; eSIM for 5G FWA.
- **Consumer behaviour**
Awareness of eSIM and factors behind it; interest in using eSIM; reason for lack of eSIM interest; use of eSIM for international roaming and associated preferences for eSIM roaming services.
- **eSIM in the IoT enterprise market**
Progress with specifications; emerging use cases across vertical sectors; impact of eSIM on IoT market growth; impact of new IoT technologies on eSIM; outlook for eSIM in private networks.
- **Stakeholders' views and expectations**
Operator and end- user enterprise views on vertical sectors driving demand for eSIM, market share of eSIM in the IoT market (compared to iSIM and traditional/removable SIM), eSIM benefits for IoT and eSIM deployment challenges.
- **eSIM innovation**
New eSIM-enabled services for consumers and enterprises; new business models leveraging eSIM; MNO and MVNO consumer eSIM strategies and propositions (e.g. eSIM first, eSIM-only and eSIM for international roaming).

~440

Number of mobile service providers offering commercial eSIM service for smartphones as of June 2024

~70%

Growth in number of eSIM smartphone connections globally in 2025 (year on year)

42%

eSIM share of total IoT cellular connections by 2030 (average across 21 countries)



Mobile impact

Scaling the digital economy through the reach of mobile and regulatory reforms

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2025 areas of focus

- **Mobile impact** The value of leveraging mobile technology to support digital economy growth and accelerate digital inclusion; the rise of digital nations; industry progress towards meeting the Sustainable Development Goals (SDGs) and the road ahead to meet the long-term goals.
- **Mobile internet connectivity** Industry progress on reducing the mobile broadband usage gap; the drivers and the key barriers to mobile internet adoption and use.
- **5G for digital transformation** Assessment of 5G progress in supporting digital transformation and economic impact across multiple areas such as spectrum, network, affordability and market development; implications for industry stakeholders and policymakers.
- **Policy and regulation** Assessment of reforms needed to support mobile impact across multiple areas such as competition, quality of service, efficient network use, demand-side stimulation, optimal framework for network investments, and removal of supply-side barriers.
- **Mobile investment gaps** Assessment of the investment required to bridge mobile coverage and usage gaps; areas of market reform that can help unlock investments and improve affordability by correcting existing market and government failures.

5.4%

In 2023, mobile technologies and services generated 5.4% of global GDP (a contribution of \$5.7 trillion of economic value added)

4.6bn

By the end of 2023, the number of people using mobile internet increased to 4.6 billion people (57% of the global population)

45

Average 5G development score of 39 countries, based on the 5G Connectivity Index as of June 2024

The 2025 Research Themes cut across all content modules

	Mobile Operators & Networks	Fixed, TV & Convergence	IoT & Enterprise	Digital Consumer	Spectrum
Network transformation	✓	✓	✓	✓	✓
AI	✓	✓	✓	✓	
Digital industries	✓	✓	✓		✓
Consumer 5G	✓			✓	✓
Fixed broadband and 5G FWA		✓		✓	✓
Consumer technology	✓	✓	✓	✓	
eSIM	✓		✓	✓	
Satellites and NTN	✓	✓	✓	✓	✓
Mobile impact	✓		✓	✓	✓
Spectrum	✓		✓		✓
Energy efficiency and circularity	✓	✓	✓	✓	

Q&A

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