

Empower the AI era



ERICSSON

The case for 6G

Introduction

The next step for networks

Global progress to 5G is well underway, with CSPs and users already seeing benefits like higher levels of automation to faster speeds. However, the 5G evolution is still ongoing, and 6G is appearing over the horizon. As it approaches, the key questions are: What can 6G do? Is the demand there? Can it generate revenue? What problems can it solve? This report answers those questions. 6G is more than just a faster connection. By building on the value mobile networks already create by connecting people, devices and industries, it marks a shift toward networks where intelligence becomes the creator of ever-greater value and services beyond communication are provided.

The shift toward intelligence

Where are networks going,
and how will 6G get us there?



In the last couple of years, telecom has reached an inflection point. With 5G's advanced capabilities, we saw the pickup of the data and information-driven era, where service providers create value by collecting, storing, transporting, analyzing and delivering data. 5G Standalone and 5G Advanced represent the first steps towards an entirely new era that 6G will fully enable—the intelligence-driven era.

Mobile networks need AI, and AI needs mobile networks. AI improves network performance, automation and energy efficiency, while high-performing networks provide the connectivity foundation for AI-powered applications, including Generative AI, agentic AI, AR, automation and physical AI. In this era, value is created not only by networks handling data, but by systems inferring, interpreting, sensing, deciding and acting autonomously in real time.

This shift wouldn't be possible without the level of digitalization that communication service providers have enabled. But what happens next?

Moving to the next level of digitalization

Massive quantities of data are being generated constantly by users, devices and networks. The raw materials for the intelligence era are right there, and we need to understand how to use them to process, infer and create intelligence at the

network edge and use that intelligence to sense, decide and act, autonomously and instantly.

3G and 4G brought about the data and information era, 5G began the process of transition to the intelligence era, and 6G will complete the transformation.



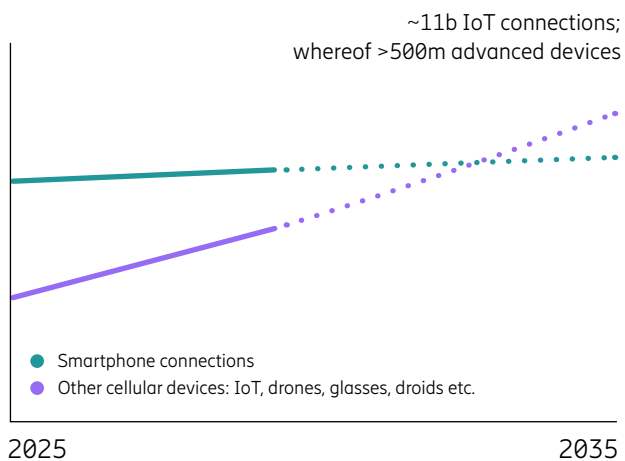
The drivers of 6G

The trends and challenges making 6G an attractive prospect

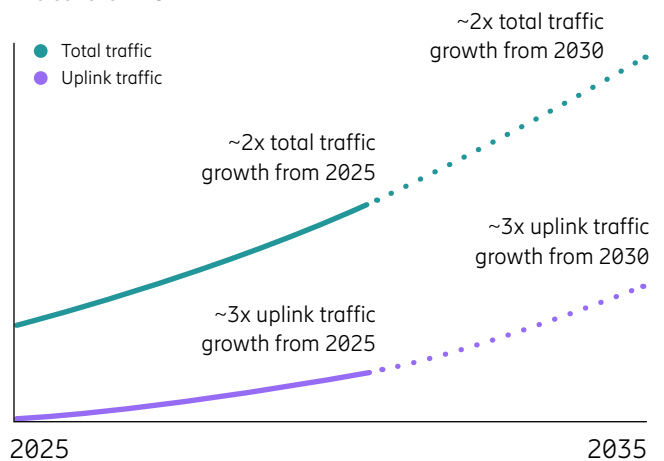
Key telecom trends

The shift to the era of intelligence is being driven by some key telecom trends that 6G is perfectly placed to respond to.

of connected devices¹



Data traffic²



2X

Total traffic growth rate every five years from 2025

3X

Total uplink traffic growth every five years from 2025

Increase in traffic levels, device types and AI workloads

Over the last 20 years, traffic growth has largely been driven by the rise of smartphones and FWA. However, with the smartphone market plateauing, future growth will be driven by IoT devices and emerging devices like drones, robots, wearables, and smart glasses with native AI applications. This shift will drive traffic, particularly in uplink, and could lead to total traffic doubling and uplink traffic tripling every five years over the next decade. 6G is a way to meet this demand.

Connecting complex, autonomous systems and services

In the intelligence era, service providers no longer simply connect a phone to another phone, or a phone to a server. Instead, they connect millions of AI-powered smart devices, AI agents and autonomous systems, with tougher speed and latency demands than ever before. The additional capacity and autonomy of 6G will enable this shift.

Demand for a trusted, sovereign stack

The shift to the intelligence era is happening at a time of geopolitical volatility. Governments are increasingly treating connectivity, cloud, AI, semiconductors and data infrastructure as components of a single strategic digital stack. These attitudes create demand for an intelligence-driven connectivity standard that serves national interests and advances technological innovation.

1. GSMA forecast to 2030: i) Mobile cellular connections, excl. IoT. and ii) Licensed cellular IoT. Assuming beyond 2030 follows current trajectory.

2. Mobile data traffic, assuming uplink-heavy use cases takes off. Assuming beyond 2030 follows current trajectory.

Current network realities

The existing network conditions that operators are currently facing also lie behind the push to 6G and the demand for a better-performing autonomous networks with more monetization opportunities.



Rule-based automation and basic slicing

Although 5G has led to advancements in network automation, many service providers still lean heavily on inflexible rule-based optimization and basic slicing that limits monetization. 6G can overcome these barriers by enabling more autonomous, intelligent and monetizable networks.

Complex multi-generational deployments

We are also at a point where service providers have at least four generations of technology from 2G to 5G in almost every network, in complex multi-generational deployments. The shift to 6G will be an opportunity for consolidation, speeding up the sunset of previous generations and boosting the capabilities of IoT at the same time.

Energy and site constraints

Adding new sites or making the network continuously work close to its limit could increase capacity, but these traditional approaches can only do so much. The number of sites is close to being maximized and sustainability and OPEX targets mean increasing energy use is not an option. 6G is a way to respond to increased data demand within the existing site grid and with increased energy efficiency.



The path to 6G deployment

Why spectrum, standards and timing matter



With today's networks approaching their limits, the most effective remaining measure to cope with a doubling of total traffic (or even a tripling of uplink traffic) every five years is to add more spectrum.

Defining the spectrum

New spectrum suitable for 6G needs to provide wide-area capacity and should, to the greatest extent possible, enable use of the same site grid as mid-band 5G deployments to reduce the number of new sites, cut costs and lower power consumption.

Key frequency ranges that Ericsson recommends for global harmonization are 6.425-7.125 and 7.125-8.4 for initial 6G launches, which are currently being studied in ITU-R towards WRC-27. There are potential variations in the new spectrum ranges for 6G deployments, for example

in the USA. In alignment with the One Big Beautiful Bill Act and a presidential memorandum, studies are ongoing on bands like 7.125-7.4 GHz, 4.4-4.94 GHz, and 2.7-2.9 GHz.

The competition for all these bands is intense, with alternative uses such as federal, satellite, and Wi-Fi competing for scarce resources. It is also expected that existing 5G spectrum will be used for 6G to add capacity, coverage, and provide a smooth path for 6G via a highly efficient, low overhead 5G/6G spectrum sharing solution from launch.

When to expect 6G

6G will be built on 3GPP standards and complemented by selected technology components specified in O-RAN to ensure global scale and broad ecosystem adoption. Work in 3GPP has already started, with the first implementable specifications targeted at the beginning of 2029. Some key decisions on waveform, bandwidth, architecture, and migration design were made in June 2026, and we expect to see the first commercial 6G deployments rolling out in 2030.



Unlocking key 6G use cases

What new opportunities will 6G enable?





With new spectrum in place, a growing need for uplink, new devices proliferating and room for improvement in fundamental network technology blocks, the stage is set for 6G. Now, the question is: What will we use it for?

Moving beyond the capabilities of 5G

In the 5G era, there were three main parameters that would make 5G the enabler of a wealth of exciting new use cases: uplink, downlink and latency.

6G will continue to build on these parameters, offering superior uplink and downlink rates for even faster speeds and single-digit-millisecond latency that satisfies the most demanding latency requirements in applications like industrial automation.

In addition, 6G brings improved capabilities like security and reliability, and new spatial awareness capabilities that go beyond what 5G could offer, opening up unique and improved applications.

Uplink, downlink, latency, security, reliability, and spatial capabilities will realize the full potential of 6G. Here we explore some main 6G use case examples toward 2035 and the opportunities they will create for CSPs, enterprises and society.

6G use case examples

Description

6G characteristics required for full value potential

		UL	DL	Latency	Security	Reliability	Spatial
Agentic traffic and global mobile internet	6G smartphone users paying extra for uplink and NTN coverage and 6G connected fixed broadband						
Integrated Sensing and Communication (ISAC)	Network enabling ISAC coverage, with CSPs providing sensing services for public safety and commercial purposes.						
AI wearables with built-in AI	Smart glasses with built-in AI, many with independent 6G connections						
CSP AI offerings	CSPs provide AI capabilities, combining CSP data with state-of-the-art AI solutions						
Smart drones, vehicles and robots	6G-reliant drones, vehicles and robots with high degrees of autonomy						
Massive IoT	Large number of 6G IoT devices requiring low-end or very high performance delivered by 6G						
Mission critical modernization	First responder and defense organizations spending on 6G capabilities						



Agentic traffic and global mobile internet

Differentiated connectivity arrived with 5G, but 6G can take it further. Some 6G smartphone users will be more likely to pay extra for differentiated uplink performance, improved coverage and service experiences such as NTN-enabled connectivity. Certain fixed broadband will be provided by 6G connection.

Integrated Sensing and Communication (ISAC)

With ISAC, the 6G network acts as a sensing array, detecting passive objects from drones in restricted airspace to crowds in packed stadiums. CSPs could provide sensing services for public safety and commercial purposes, with 6G offering them as native network capabilities.

AR wearables with built-in AI

Smart glasses have been positioned as the 'next big thing' for over a decade. But with better form factors and built-in AI, they are now gaining consumer traction. Untethered 6G connectivity will help support more advanced and immersive wearable experiences, with 6G's uplink, downlink, latency, security, and spatial awareness key to widespread adoption.

CSP AI offerings

6G's superior uplink and intent-based security will give operators new ways to create opportunities for AI-based enterprise offerings, including letting enterprises use edge compute capacity to run AI inference.

Smart drones, vehicles and robots

Security, predictive reliability, precision positioning, latency and uplink make this use case well suited to next-generation mobile connectivity. 6G offers major gains in cell-edge throughput and spectral efficiency, even before new equipment upgrades. This is critical for enabling 6G-reliant smart drones, vehicles and robots to operate reliably in demanding environments.

Massive IoT

6G will be crucial for handling the scale and diversity of IoT devices, from devices with very low requirements currently served by 2G to high-performance use cases that mobile networks do not yet support.

Mission critical modernization

6G's superior uplink, intent-based security, reliability and spatial awareness make it well suited to mission-critical networks, particularly in defense and public safety. By 2035, 6G will play an important role in modernizing communications for first responders, defense and other critical operations.



The full spectrum of 6G capabilities

Expand your network's potential

Many of 6G's capabilities will accelerate the improvements already being made by 5G SA, while others will unlock new opportunities, building a new generation of connectivity that will be AI-native, highly autonomous, secure and energy optimized.

Built for AI traffic

Uplink traffic will rise dramatically in the long term, but uplink-intensive use cases are already growing. 6G will help CSPs respond to the new traffic patterns that are emerging, continuing the progress made in uplink by 5G SA and FDD Massive MIMO and providing uplink data rates that are 10 times better than what in-field 5G will deliver in 2028.

Smooth migration

Effectively responding to new connectivity demands will require a smooth transition toward 6G when it becomes available. Through highly efficient 5G and 6G spectrum sharing, spectrum aggregation on all 6G bands and core evolution from 5G SA to 6G, CSPs will be able to make the shift efficiently.

Spatial awareness through ISAC

ISAC capabilities will generate masses of valuable data that service providers will be able to capture. Adding sensing to the mobile network creates an entirely new revenue stream that will help service providers grow beyond connectivity offerings.

Maximizing spectrum

6G's additional spectrum will help provide the additional level of performance that users are going to demand. It also enables better utilization of existing spectrum assets through UL/DL decoupling, overcoming the limitations of current mobile networks.

Wide area experiences

5G enabled the first differentiated connectivity offerings, but 6G will take them to the next level, enabling differentiated services on a much more granular level and dynamic scale. More opportunities for slicing and guaranteed performance services will appear, aided by AI that delivers the required connectivity to premium users or apps while preserving the rest of the network.

Going beyond MBB

Monetizing the network in the 6G era means moving beyond mobile broadband. 6G's capabilities in massive IoT, improved FWA and NTN will drive connectivity services further and make 6G the first mobile generation to cover all use cases with one scalable radio access technology.

The next
wave of value
creation

More than just a new generation

For the operators responsible for rolling out 6G and making it a success, value creation from lower costs and new revenue streams will make the transformation worthwhile.

Efficiency gains

Building on the automation advances already emerging in 5G, 6G will improve OPEX through higher levels of autonomy and new AI capabilities. It will also improve network TCO by expanding the capacity of the existing network through higher spectral efficiency and future product enhancements.

New revenue uplift

AI-powered connectivity use cases demand better uplink performance, creating new opportunities for operators to monetize AI applications. Advanced differentiated connectivity using customized SLAs and multi-slicing at scale will make premium offerings easy to introduce, while ISAC opens new opportunities beyond connectivity services. Across CSPs, this points to potential growth of 10% to 40% CAGR over the next 10 to 15 years.

6G will not arrive as a simple speed upgrade. It marks a deeper transition in what networks are built to do: sense, decide, adapt and create value in real time. For CSPs, the opportunity starts now—getting a head start by moving to 5G Standalone and 5G Advanced, which will be a stepping stone towards 6G and provide a smooth path from 5G SA to 6G SA. By working proactively, we together can start building the foundations of an intelligence driven future.

Learn more about the next
generation of mobile connectivity
at ericsson.com/6G