



ERICSSON

Unlock the uplink

**Your network is as
good as your uplink**

Executive summary



Mobile networks were built mainly for downloading content, but usage is shifting. Today, more data is being created and uploaded through user generated live streaming, video calling and conference, professional live streaming and broadcasts, online gaming, AR/VR. In addition, Artificial intelligence (AI)/AR glasses are expected to put higher

demand on robust uplink performance and user experience. This makes strong uplink performance essential.

Uplink refers to data transmission from the user device to the mobile network. Its performance is often more constrained than downlink because devices have lower transmit power, and networks have historically prioritized download traffic.

With rising upload-heavy applications, one-size-fits-all connectivity is no longer enough. Communication service providers (CSPs) must differentiate uplink performance and create tailored offers to fulfil the Uplink needs for consumer, enterprise, and industrial.

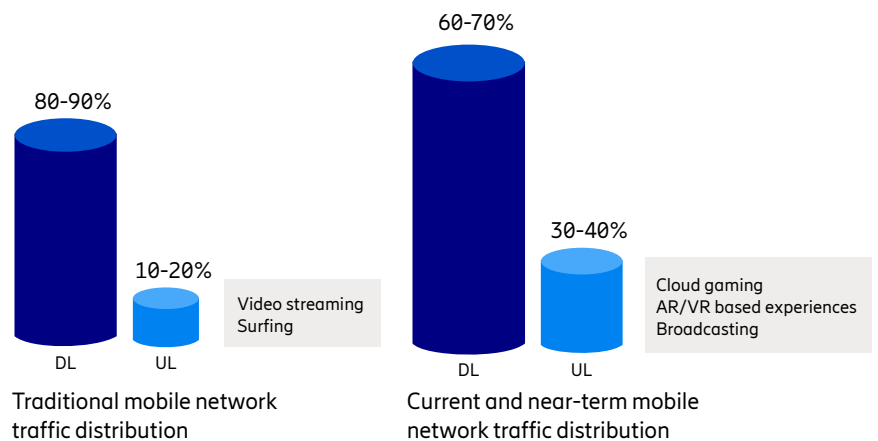
Mobile traffic trend and the uplink surge

Historically, mobile networks have served downlink-heavy applications like streaming and web browsing (80-90 percent DL and 10-20 percent UL). This trend is changing as users transform from data consumers to data prosumers (data producers). Applications like extended reality (XR) based communication, smart virtual assistants, live streaming, etc., have increased uplink share of traffic (60-70 percent DL and 30-40 percent UL). Modern applications require fast, reliable, real-time uploading.

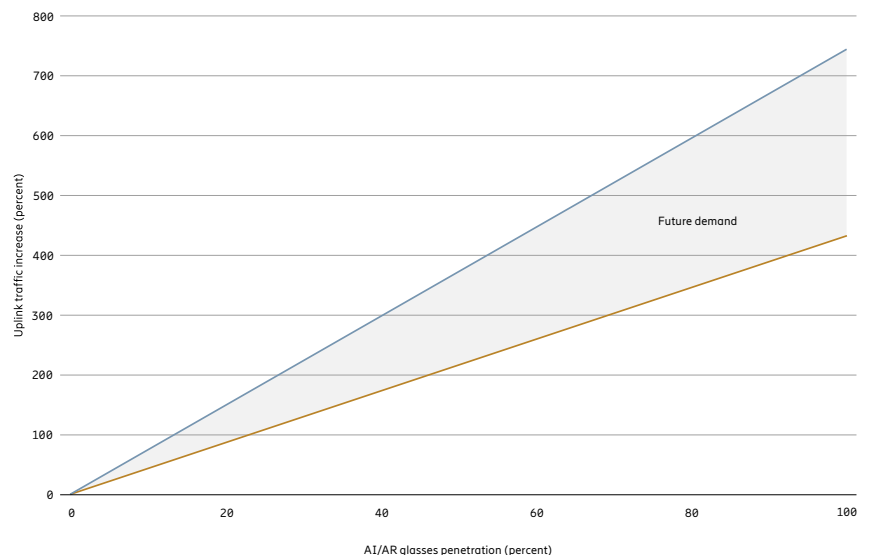
Such as:

- Professional video broadcasting needs 25–50 Mbps upload speeds and special network priority.
- Live social streaming needs 5–20 Mbps.
- AR/VR and cloud gaming need constant data uploads (2–20 Mbps) to run smoothly.

This shift will accelerate as AI, cloud, and mobile converge (Ericsson Mobility Report, November 2025). Devices continuously sending data for processing and personalization will drive further growth. With just **20 percent adoption of AI/AR glasses**, uplink traffic could increase by **100–200 percent** compared to today.



Securing uplink is important for usecases like broadcasting, photojournalism, AR/VR gaming, public safety etc.

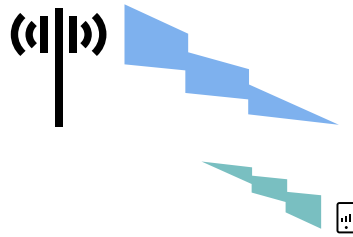


Uplink traffic increase with regard to today's uplink baseline versus AI/AR glass penetration

Understanding uplink bottlenecks

Device transmit power

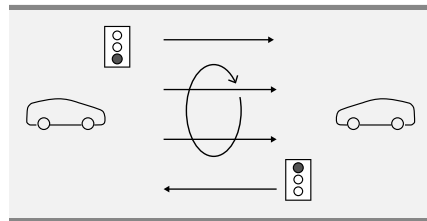
Mobile device operates with a transmit power limit of 200 mW (1000 times less than high-power base stations ~200W). Power constraints cause weaker uplink signals, especially at the cell edge, causing dropped connections and poor performance in low signal areas.



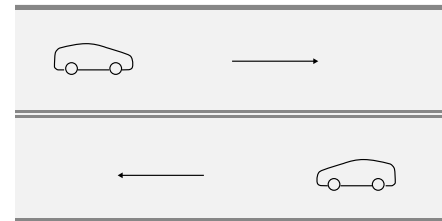
Asymmetric UL and DL

5G networks often allocate more resources to downlink than uplink, resulting in uplink resource starvation. 5G deployment is mainly handled by midband Time Division Duplex (TDD) spectrum, attributed to higher network performance. In TDD systems, there is no equal spectrum distribution between UL and DL resources, unlike Frequency Division Duplex (FDD), where DL and UL have equal resources. This asymmetric spectrum allocation in TDD pose an additional challenge for use cases which are uplink heavy.

TDD access

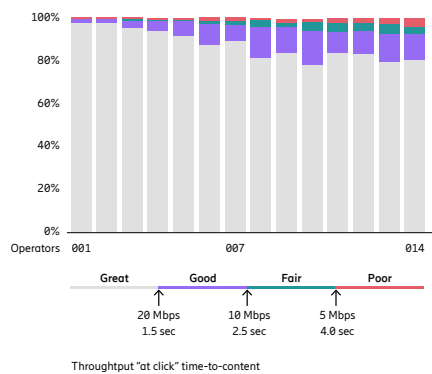


FDD access

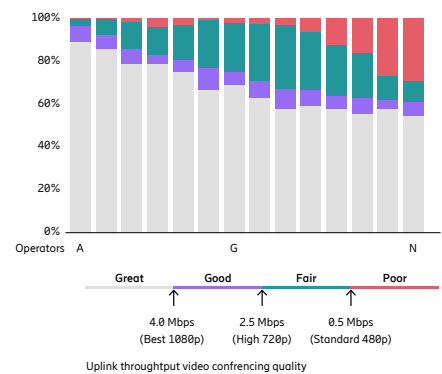


In the graph on the right, we can see the difference between downlink versus uplink experience for users across Europe. While downlink experience is improving and on right path, uplink experience today in a typical operator's network in Europe face significant performance issues. Majority of operators having fair to poor uplink experience between 10% to 30% (<0.5Mbps to 2.5Mbps) and it will become more challenging with adoption of AR/VR, professional video broadcasting, video conferencing, AI agents etc.

Downlink experience

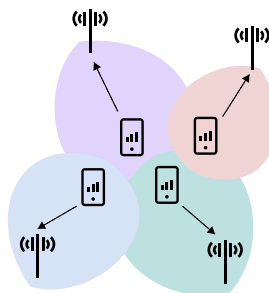


Uplink experience



Uplink interference management and scheduling complexity

Weaker uplink signal strength faces higher noise and interference, reducing effective coverage. Unlike downlink, where transmissions originate from a small number of coordinated base stations, uplink transmissions come from many spatially distributed UEs. This decentralization yields unpredictable interference patterns that complicate interference mitigation, scheduling, and capacity planning.



Key takeaways

As mobile networks evolve from primarily supporting downlink-heavy applications to increasingly uplink-intensive use cases, it is critical to recognize that uplink capacity is a scarce and valuable resource. Current one-size-fits-all connectivity will not meet uplink needs in mobile networks.

If uplink capacity is shared evenly among all users and applications, none will receive the level of performance necessary to meet their specific needs, resulting in suboptimal user experiences across the board.

Differentiating uplink resources based on application demands and user scenarios is therefore imperative.

Communication service providers should implement tailored strategies that prioritize uplink bandwidth and latency for critical and latency-sensitive applications, while allocating appropriate resources for less urgent data transfers. By doing so, networks can ensure that high-value uplink services operate smoothly and reliably, enhancing overall user

satisfaction and supporting the growing ecosystem of uplink-heavy applications. In summary, the key to unlocking the uplink lies in intelligent, differentiated resource management that aligns network capabilities with the varied priorities of modern uplink traffic.

This approach will enable networks to meet rising uplink demands effectively and sustain the convergence of AI, cloud, and mobile technologies going forward.



References

- [1. Enhancing 5G uplink performance to enable differentiated services](#)
- [2. Ericsson Mobility Report, November 2025](#)

Authors



M. Carmen Perea is a senior telecommunications leader serving as Engagement Sales Manager within Market Area Europe, Middle East & Africa. With more than 25 years of experience across multiple network domains and strategic roles, she brings a uniquely comprehensive end-to-end perspective of the telecom ecosystem. In her current role as RAN Presales Engagement Manager, she drives the strategic agenda for 5G monetization and intelligent RAN automation across EMEA. She partners closely with C-suite stakeholders to shape high-impact network strategies, translating advanced RAN and SMO capabilities into measurable commercial and operational outcomes.



Usman Shahab is a telecom executive and industry expert with over 20 years of experience leading large-scale 4G and 5G network transformation across the Middle East and Africa. He has held senior leadership roles in network technical sales across consumer and enterprise domains and is recognized for aligning advanced technologies with business and customer outcomes. His expertise spans Ericsson's RAN portfolio, 5G and 5G Advanced, network monetization, and AI-driven automation, including rApps. Since 2020, he has led the regional 5G program, shaping monetization strategies and guiding network evolution across the region.



Antonio Escalona is a Network Performance and Evolution Lead at Ericsson with more than 15 years of experience in mobile communications, specializing in 5G, Massive MIMO, and RAN investment strategies. He has held key roles across network design, optimization, and R&D, delivering measurable performance improvements across multiple international markets. Antonio is recognized for combining deep technical expertise with strong business acumen to design market-optimized network solutions. Since 2021, he has led strategic network evolution initiatives across Europe, Latin America, and Africa.

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