Dynamic Spectrum Alliance Limited
http://www.dynamicspectrumalliance.org

May 5, 2026

Markets and Consumers Team
Digital Infrastructure Directorate
Department for Science, Innovation and Technology
22 Whitehall, London, SW1A 2EG
telecoms@dsit.gov.uk

Re: Mobile Market Review: call for evidence

Dear Sir/Madam,

The Dynamic Spectrum Alliance [1] (DSA) welcomes the opportunity to respond to the UK Government's Mobile Market Review. As demand for wireless connectivity continues to grow, driven by popular data applications, digital transformation, and emerging technologies, spectrum policy plays a critical role in enabling long-term economic growth and societal benefit. In this context, it is increasingly important to adopt forward-looking, flexible, and technology-neutral approaches to spectrum management that maximise the overall value of this finite resource.

The DSA highlights the evolving role of connectivity in supporting the broader digital economy, where the majority of value is generated by the services and applications enabled by connectivity rather than connectivity itself. It also emphasises the importance of licence-exempt technologies, such as Wi-Fi, which play a central role in delivering high-capacity, cost-effective connectivity across residential, enterprise, and public environments.

In particular, this submission underscores the importance of ensuring sufficient access to mid-band spectrum, including the 6 GHz band, to support next-generation technologies and use cases. It further highlights the need for balanced and evidence-based approaches to spectrum sharing, enabling innovation while ensuring appropriate protection of incumbent services.

The DSA aims to contribute constructively to the development of a spectrum policy framework that supports investment, fosters innovation, and enables the UK to maintain its leadership in digital infrastructure and connectivity.

Sincerely,

Dr. Martha Suarez
President
Dynamic Spectrum Alliance

[1] The DSA is a global, cross-industry, not for profit organization advocating for laws, regulations, and economic best practices that will lead to more efficient utilization of spectrum, fostering innovation and affordable connectivity for all. Our membership spans multinationals, small-and medium-sized enterprises, as well as academic, research and other organizations from around the world all working to create innovative solutions that will benefit consumers and businesses alike by making spectrum abundant through dynamic spectrum sharing. A full list of DSA members is available on the DSA's website at:https://www.dynamicspectrumalliance.org/members.

5. Technological and structural evolution of the sector can support new revenue opportunities in the consumer, business and public sector markets.

Technological and structural evolution in the connectivity sector—particularly the growth of licence-exempt technologies, advanced Wi-Fi, and spectrum-sharing frameworks—is expected to unlock significant new revenue opportunities across consumer, enterprise, and public sector markets. These opportunities extend beyond traditional mobile services and are increasingly driven by the broader digital ecosystem.

a. Provide a description of the new revenue opportunities available over the next decade

Over the next decade, the most significant new revenue opportunities will come from expanded use of licence-exempt and shared spectrum, especially for next generation Wi-Fi technologies, Automated Frequency Coordination (AFC) enabled Standard Power operations in 6 GHz, private networks, fixed wireless access, and converged fixed-mobile services. These developments will support high-capacity connectivity in homes, enterprises, hospitals, factories, campuses, transport hubs, smart cities, and public venues, creating revenue opportunities for operators, infrastructure providers, device vendors, and managed service providers alike.

In particular, access to more 6 GHz spectrum can unlock new managed Wi-Fi services, industrial connectivity solutions, neutral-host deployments, and enterprise-grade indoor and outdoor wireless services. AFC-based Standard Power can also expand the addressable market for outdoor and campus deployments that cannot be served effectively by low-power indoor-only models.

b. Provide an evidenced estimate on the value of these new opportunities over the next decade

The value of these opportunities is substantial. Independent and industry analyses cited by DSA and other stakeholders indicate that Wi-Fi and broader connectivity expansion can generate large economic benefits through productivity gains, improved digital inclusion, and new enterprise use cases, while a study conducted for the Wi-Fi Alliance estimates that the global economic value of Wi-Fi[2] would grow from approximately $3.3 trillion in 2021 to $4.9 trillion by 2025, representing around 150% growth compared to 2018 levels. The study highlights that Wi-Fi is a major driver of the digital economy, with its value shaped by increasing connectivity demand, technological advancements, and access to additional spectrum.

For the UK specifically, the scale of economic benefit will depend on the pace at which policy enables access to the full 6 GHz ecosystem, including harmonised device availability and regulatory certainty. The strongest value will come not from spectrum access alone, but from the services it enables: higher-capacity indoor networks, enhanced public-venue connectivity, industrial automation, telehealth, education, and smart-city applications.

Evidence indicates that the majority of economic value generated by advanced connectivity arises from services and applications enabled by connectivity, rather than connectivity itself.

- The OECD Digital Economy Outlook 2024[3] shows that digital technologies and connectivity infrastructure are central to economic growth, with the ICT sector outpacing the wider economy and supporting wider digital transformation.
- Licence-exempt technologies such as Wi-Fi underpin innovation across consumer, enterprise, and public-sector domains, carrying the majority of broadband traffic indoors and

[2] https://www.wi-fi.org/system/files/Global_Economic_Value_of_Wi-Fi_2021-2025_202109.pdf
[3] https://www.oecd.org/content/dam/oecd/en/publications/reports/2024/11/oecd-digital-economy-outlook-2024-volume-2_9b2801fc/3adf705b-en.pdf

serving as the foundation for high-capacity services.

These trends demonstrate that enabling access to spectrum for licence-exempt use is critical to unlocking downstream economic value. Without progressive policy, the UK risks missing out on the trillions in GDP gains projected globally.

c. Provide evidence on the sectors' ability to capitalise on these new revenue opportunities and any barriers to deployment and uptake.

The UK is well positioned to capitalise on the significant economic opportunities enabled by advanced connectivity. It benefits from high levels of broadband penetration, widespread adoption of wireless technologies, and a mature digital services ecosystem. The extensive use of Wi-Fi across residential, enterprise, and public environments demonstrates the sector's ability to deliver scalable, high-capacity connectivity that underpins data-intensive applications and digital services.

In addition, strong demand drivers—such as increasing data consumption, growth in cloud-based services, and the expansion of digital applications across sectors—indicate that market conditions are favourable for capturing the economic value identified above. This suggests that the UK has both the technical capability and demand base to support continued growth in connectivity-enabled services.

However, several structural and market barriers may affect the extent to which these opportunities can be fully realised:

- **Capacity constraints in high-demand environments**
  As data traffic continues to grow—particularly in dense urban areas and indoor environments—network capacity may become a limiting factor. Without sufficient capacity, the performance of high-bandwidth and latency-sensitive applications may be constrained.

- **Deployment and investment challenges**
  The cost of upgrading and expanding connectivity infrastructure, particularly in rural and low-density areas, can limit the commercial viability of deployments. This may slow the availability of advanced services in certain regions.

- **Ecosystem readiness and adoption cycles**
  The realisation of economic value depends on the adoption of new technologies across devices, applications, and industries. Delays in device availability, enterprise adoption, or integration into existing systems may slow uptake of next-generation services.

- **Integration complexity across technologies**
  Many high-value use cases—such as industrial automation, smart cities, and digital healthcare—require integration across connectivity, cloud, edge computing, and AI platforms. This complexity can create barriers to deployment, particularly for smaller organisations or public sector entities.

- **Variability in user experience and service quality**
  Differences in network performance across locations and environments may impact the consistency of service delivery, which is critical for advanced applications such as real-time communications and mission-critical services.

Overall, while the UK has strong foundational capabilities and favourable market conditions to capitalise on connectivity-driven opportunities, addressing capacity, cost, and ecosystem-related challenges will be important to ensure that the full economic value identified can be effectively realised across all sectors.

6. How can the UK's approach to spectrum policy and regulation be improved to better enable innovation and investment? Please provide evidence outlining any barriers that currently hinder progress and suggestions for unlocking new opportunities.

To better enable innovation and investment, the UK's spectrum policy framework should continue evolving toward more flexible, technology-neutral, and forward-looking approaches that support efficient spectrum utilization and emerging connectivity needs.

- **Expand access to licence-exempt spectrum, particularly in the 6 GHz band**
  Licence-exempt spectrum is a key enabler of innovation, particularly for Wi-Fi, which underpins affordable, high-capacity connectivity across homes, businesses, campuses, and public venues. Evidence shows that Wi-Fi plays a central role in overall data delivery, with a significant proportion of traffic being offloaded from mobile networks onto Wi-Fi, highlighting its importance in supporting network capacity and user experience. In addition, the rapid growth in Wi-Fi infrastructure—such as the expansion of public hotspots, projected to reach hundreds of millions globally—demonstrates increasing reliance on licence-exempt technologies to meet rising connectivity demand.[4]
  Expanding access to the 6 GHz band would enable wider channel bandwidths and significantly increase network capacity, supporting next-generation applications such as immersive services, cloud computing, and enterprise connectivity. International experience shows that increased spectrum availability directly improves performance, reduces congestion, and supports innovation in both consumer and industrial use cases.
  We urge DSIT to support Ofcom's evidence-based approach to this decision. It is critical for the evolution of intelligent AI wearables that, in addition to the decisions already taken on the lower 6 GHz band, the UK proceeds with Ofcom's proposed path of authorizing a further 160 MHz channel in the lower part of the upper 6 GHz band for licence-exempt Wi-Fi under the same rules as lower 6 GHz band and going forward, enabling access for very lower power Wi-Fi in the remaining upper portion of the upper 6 GHz band.

- **Enable Standard Power operation through AFC frameworks**
  To unlock the full potential of the 6 GHz band, the UK should consider enabling Standard Power Wi-Fi supported by database controlled access such as an AFC systems. International experience demonstrates that AFC can effectively protect incumbent services such as fixed links and satellite operations, while allowing higher-power outdoor use cases that are critical for industrial, enterprise, and rural connectivity. Regulatory frameworks such as those adopted by the FCC demonstrate that AFC can effectively protect incumbent services while enabling standard power operations.[5]

- **Base coexistence assessments on realistic deployment assumptions**
  A balanced interpretation of coexistence analyses is necessary to capture both the technical risks and the practical feasibility of spectrum sharing. Policy decisions should be grounded in realistic deployment and usage conditions, rather than relying solely on highly conservative worst-case scenarios. For example, ECC studies [6][7] using Monte Carlo simulations demonstrate that, under realistic deployment models, interference thresholds are

[4] https://www.cisco.com/c/dam/en/us/solutions/collateral/executive-perspectives/annual-internet-report/air-executive-summary-pgr-mobility.pdf
[5] https://docs.fcc.gov/public/attachments/FCC-20-51A1.pdf
[6] https://docdb.cept.org/download/1397
[7] https://docdb.cept.org/download/1430

not exceeded. This evidence shows that while conservative assumptions can highlight potential risks, they do not reflect the actual operating environment of RLAN systems, which are predominantly indoor, subject to building entry loss, and operate with limited duty cycles. Regulatory frameworks should therefore weigh both the protective needs of incumbents and the efficiency gains achievable through proportionate, evidence-based sharing measures.

- **Consider real-time contention based protocols to enable spectrum sharing between IMT and Very Low Power RLAN**
  Recent technical studies, including comprehensive measurements and simulations conducted by LS Telcom and one of our members and submitted to PT1 and European regulators including Ofcom, demonstrate that VLP interference with IMT is negligible under all realistic deployment conditions. Interference only occurs under extreme and highly improbable conditions, specifically, if a VLP device operates at maximum power in direct proximity to an IMT base station receiver with no structural attenuation. In any realistic indoor deployment, this condition does not arise. Real-time sharing would yield significantly improved efficient use of spectrum.[8]

- **Provide regulatory certainty and timely decisions**
  Clear timelines and predictable regulatory processes are essential to support investment. Ofcom has consistently emphasised that regulatory certainty and timely access to spectrum are key factors in enabling investment, fostering innovation, and supporting the development of equipment ecosystems.[9] Prolonged uncertainty—particularly regarding the future use of the upper 6 GHz spectrum—can delay infrastructure deployment, slow the development of device ecosystems, and reduce incentives for innovation. Ensuring timely and transparent decision-making will therefore be critical to maintaining the UK's competitiveness in next-generation connectivity.

- **Support global harmonization while enabling regional leadership**
  Aligning with international approaches where appropriate helps improve device availability, reduce costs, and accelerate market adoption. Ofcom has emphasised that international harmonisation of spectrum use can provide greater certainty for manufacturers and operators, enabling economies of scale and encouraging investment in equipment and services.[10] For example, Ofcom's approach to the upper 6 GHz band highlights the importance of working with international partners to develop harmonised frameworks, which can support the development of a robust device ecosystem and facilitate wider adoption of new technologies.[11] At the same time, Ofcom has also recognised the opportunity for the UK to take a leadership role by advancing innovative spectrum-sharing models—such as hybrid sharing between mobile and Wi-Fi—which aim to maximise overall spectrum value while ensuring appropriate protection of incumbent services.[12]

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[8] https://www.cept.org/ecc/groups/ecc/ecc-pt1/client/meeting-documents/file-history?fid=93814
[9] https://www.ofcom.org.uk/spectrum/innovative-use-of-spectrum/enabling-automated-frequency-coordination-afc-in-the-6-ghz-band
[10] https://www.ofcom.org.uk/spectrum/innovative-use-of-spectrum/ofcom-pioneers-sharing-of-upper-6-ghz-spectrum-between-mobile-and-wi-fi-services
[11] https://www.ofcom.org.uk/spectrum/innovative-use-of-spectrum/consultation-expanding-access-to-the-6-ghz-band-for-commercial-mobile-and-wi-fi-services
[12] https://www.ofcom.org.uk/spectrum/innovative-use-of-spectrum/sharing-6-ghz-spectrum-for-wi-fi-and-

- **Adopt data-driven and adaptive spectrum management**
  Modern spectrum policy should increasingly rely on real-world evidence and adaptive, data-driven approaches, rather than static and highly conservative assumptions. Tools such as AFC enable dynamic spectrum access by using real-time database information to manage interference risks while maximising spectrum utilisation.
  Regulatory experience supports this approach. The FCC has adopted AFC frameworks for standard-power operations in the 6 GHz band, concluding that database-driven coordination can effectively protect incumbent services while enabling more intensive and flexible spectrum use. This represents a shift from traditional static exclusion models toward more efficient, technology-enabled spectrum management.
  Similarly, Ofcom has recognised the growing importance of innovative spectrum-sharing approaches and the role of data-driven tools in enabling more efficient use of spectrum resources. These approaches support a transition toward dynamic spectrum access models that can adapt to real-world deployment conditions and evolving demand.
  Adopting such adaptive frameworks can improve spectrum efficiency, reduce unnecessary constraints on deployment, and create an environment that encourages innovation and investment, while maintaining appropriate protection for incumbent users.

By expanding licence-exempt access, enabling AFC-based standard power operations, and adopting balanced, forward-looking regulatory approaches, the UK can strengthen its position as a leader in wireless innovation while ensuring effective protection of incumbent services effectively.

13. Please provide detailed evidence outlining how mobile traffic will develop over the next decade, focusing specifically on changes to:

a. Volume of Traffic

Wi-Fi already carries a substantial share of global Internet traffic,[13] supported by the rapid expansion of fixed broadband networks. Between 2019 and 2025, global fixed-broadband traffic more than tripled—from below 2,000 exabytes to over 7,000 exabytes—with Europe among the fastest-growing regions. This growth reflects increasing reliance on high-capacity connectivity for streaming, cloud computing, remote working, and enterprise digitalisation. Over the same period, mobile-broadband traffic has also grown significantly, increasing from below 500 exabytes to over 1,500 exabytes, highlighting the complementary role of mobile networks in delivering ubiquitous connectivity.

At the user level, Europe exhibits comparatively high levels of fixed-broadband usage, with average monthly traffic per subscription reaching approximately 442 GB, significantly above the global average of 369 GB. In the UK, for instance, Ofcom's Connected Nations 2025 report[14] confirms that average monthly residential fixed-broadband consumption reached 583 GB—surpassing the broader European average—with households utilizing full-fiber services consuming even more, at 738 GB per month.

In the mobile domain, usage in Europe remains broadly aligned with global trends, at around 16 GB per subscription per month compared to 15 GB globally. This indicates a balanced development between fixed and mobile connectivity, with fixed networks continuing to carry the majority of data traffic.

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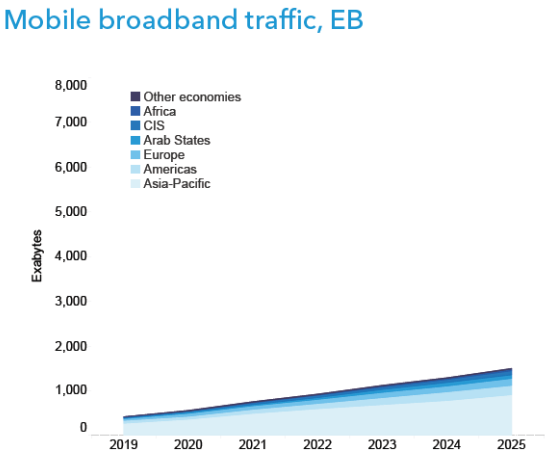
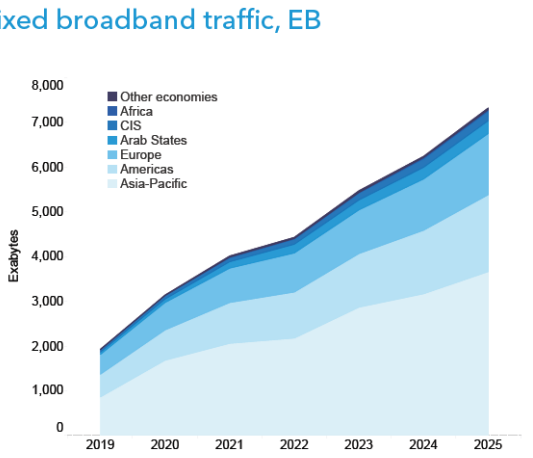
mobile

[13] https://www.itu.int/itu-d/reports/statistics/2025/10/15/ff25-internet-traffic/
[14] https://www.scribd.com/document/971435511/Connected-Nations-UK-Report-2025

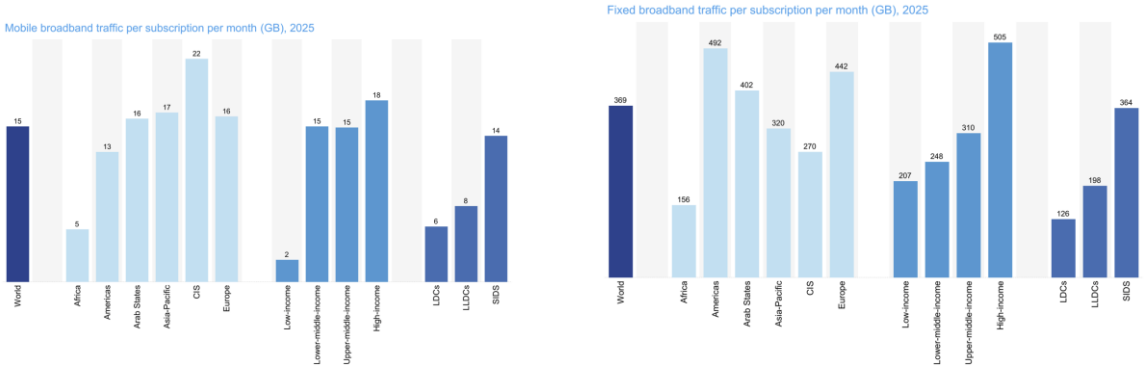


Note: 1 exabyte (EB) = 10^{12} megabytes. Refers to traffic within the country. Interactive chart.
Source: ITU



Note: 1 exabyte (EB) = 10^{12} megabytes. Interactive chart.
Source: ITU

Year-over-Year Growth of Broadband Traffic



Internet traffic per subscription per month (GB)

Taken together, these trends underline the growing importance of robust indoor and local-area connectivity, where Wi-Fi plays a central role in delivering high-capacity, low-latency services. Ensuring sufficient access to mid-band spectrum—particularly within the 6 GHz range—will therefore be essential to sustain current growth trajectories, support advanced digital applications, and enable continued innovation across residential, enterprise, and public-sector environments.

b. Type of Traffic

The composition of traffic is also evolving significantly, with increasing demand for:

- **Smart Glasses & AR/VR for Training:** Meta (in partnership with *EssilorLuxottica*) has integrated upper 6 GHz Wi-Fi connectivity for its next-gen smart glasses, enabling advanced AI interactions such as live translation, real-time speech translation, contextual visual assistance, and remote collaboration.[15] These glasses exist today and are already in the market. AI-glasses sold were above 7 million units in the full year. The 7 million+ units in 2025 represented a more

[15] https://www.essilorluxottica.com/en/newsroom/press-releases/partnership-new-ai-glasses/

than tripling of combined sales from 2023 and 2024, which together totalled approximately 2 million units (as reported in EssilorLuxottica's February 2025 quarterly results)[16].

An IEEE-led trial at Thailand's Ramathibodi Hospital deployed AR/VR devices over the full 6 GHz band to support remote medical training and live HD video transmission. The hospital's pilot showed the need for 7×160 MHz channels (only available across the full 6 GHz band) to maintain optimal AR/VR user experience under load.[17] With numerous hospitals across the UK, access to the full upper 6 GHz band will be critical to support innovative solutions across patient care, medical training, and emergency response.

- **Public Wi-Fi in Smart Cities:** At Extreme Connect 2024,[18] Pharr, TX became one of the first U.S. cities to activate outdoor Wi-Fi 6E using the full 6 GHz band using Extreme Networks' AP5050 access points. This network provides high-capacity public Wi-Fi, citywide video surveillance, and supports future AR navigation apps in parks and other public spaces. Doubled bandwidth capacity and reduced interference support smart city applications such as license plate recognition systems. For Smart Cities like Tokyo, Barcelona and others, a seamless transition between networks enables reliable, continuous connectivity for citizens and devices alike, supporting applications like real-time traffic monitoring, public safety systems, and IoT-based services. Municipalities and public Wi-Fi providers are expected to prioritize Open Roaming to enhance user experience, simplify network management, and foster more data-rich urban environments.[19]

- **Sports and entertainment**: Notre Dame Stadium, with over 1,100 access points for its 80,000 seats, the University of Tennessee's Neyland Stadium, which also uses HPE Aruba Networking to enable over 102,000 fans, and many more arenas around the world take advantage of increased capacity, wider channels, and significantly reduced signal interference of 6 GHz when live streaming and uploading recorded content at games.[20]

- **Education**: The University of Michigan deployed the world's largest Wi-Fi 6E education deployment with more than 16,000 Wi-Fi 6E APs across two campuses to provide the ability to move an enormous amount of data, enabling 500 students in a classroom to connect via Zoom, share screens, record videos, and support projects simultaneously.[21] More than 4,000 European higher education institutions[22] will stand to benefit from access to high speed connectivity offered by robust Wi-Fi campus networks to meet the growing demand for connectivity from students and staff alike.

- **Robotics & Factory Automation**: AT&T, CommScope (RUCKUS Networks), and Intel, together with the Wireless Broadband Alliance (WBA), have conducted real-world Wi-Fi 7 trials in enterprise environments to compare its performance with Wi-Fi 6E. The results

[16] https://www.essilorluxottica.com/en/newsroom/press-releases/q4-full-year-2025-results/
[17] https://www.ofcom.org.uk/siteassets/resources/documents/consultations/category-3-4-weeks/consultation-expanding-access-to-the-6-ghz-band-for-commercial-mobile-and-wi-fi-services/responses/meta-platforms-ltd.pdf?v=397066
[18] https://statetechmagazine.com/article/2024/04/extreme-connect-2024-agencies-can-use-wi-fi-6e-connectivity-outdoors
[19] https://wballiance.com/wi-fi-predictions-for-2025
[20] https://www.wi-fi.com/podcast/deploying-wi-fi-6e
[21] https://michigan.it.umich.edu/news/2022/06/28/u-m-first-in-nation-to-offer-wifi-6e-universitywide-accomplishment-is-an-investment-in-the-future
[22] https://ehea.info/Upload/Chapter_1_EHEA_key_data_1_.pdf

highlight Wi-Fi 7's ability to power mission-critical applications, including XR, AI, cloud computing, and industrial IoT. Results show that, using the full 6 GHz band, Wi-Fi 7 delivers sustained 1 Gbps+ speeds at 40 ft, ultra-low latency and improved efficiency for AR/VR, video conferencing and automation, and greater network reliability for industrial IoT.[23] With a vibrant industry across the UK, access to the 6 GHz band for WAS/RLAN will be crucial for automation, enabling greater flexibility, scalability, and efficiency in manufacturing.

c. Drivers of Traffic

1. Infrastructure Expansion

- **FTTH rollout and broadband upgrades:** Over 90% of in-home and enterprise broadband traffic in Europe is carried over Wi-Fi[24]. As fibre-to-the-home (FTTH) penetration grows, Wi-Fi will remain the de facto access layer for Europe's digital economy. Over 200 million homes in Europe are expected to have FTTH coverage by 2029. Wi-Fi will remain the de facto local wireless broadband connectivity standard for the vast majority of users.[25]

2. Device Ecosystem Evolution

- **Proliferation of connected devices:** As of the end of 2024, more than 5,000 device models supported 6 GHz Wi-Fi, encompassing both Wi-Fi 6E and Wi-Fi 7 technologies. This rapid adoption underscores the significant market momentum behind these standards.[26] The Wi-Fi Alliance has forecasted that Wi-Fi 7 device shipments will reach approximately 2.1 billion units by 2028, highlighting the anticipated widespread adoption of this next-generation Wi-Fi standard.[27] Marquee devices with Wi-Fi 6E support – including the Apple iPad Pro, Google Pixel 7 and 7 Pro, and Samsung Neo QLED 8K TVs – will transform Wi-Fi experiences for users around the world. Devices like the Meta Quest Pro will help optimize VR, offer opportunities for deeper collaboration, and give users early access to the metaverse.[28]

3. Application-Led Demand

- **Immersive applications (AR/VR/XR):** Advanced applications in areas such as training, healthcare, and entertainment require high throughput, ultra-low latency, and wide contiguous channels (e.g. 160 MHz and above).
- **Smart cities and public connectivity:** Urban digital infrastructure—including public Wi-Fi, surveillance systems, navigation services, and connected signage—generates continuous and scalable traffic demand.
- **Large venues and high-density environments:** Locations such as stadiums, transport hubs, and event venues create extreme peak traffic conditions, with tens of thousands of concurrent users engaging in video streaming, social media, and interactive services.

4. Enterprise and Industrial Transformation

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[23] https://wballiance.com/resource/wi-fi-7-trials-for-enterprise-scenarios-tt-commscope-and-intel

[24] https://6ghz.info/wp-content/uploads/2022/09/6-GHz-Infographic-Europe.pdf

[25] https://techblog.comsoc.org/2022/05/24/57-of-european-homes-can-now-get-ftth-b-internet-access-50-growth-forecas

[26] https://wifinowglobal.com/news-and-blog/massive-market-adoption-5000-wi-fi-devices-now-support-6-ghz-1230-support-wi-fi-7-intel-says/

[27] https://www.wi-fi.org/system/files/Wi-Fi_Alliance_Insider_202401.pdf

[28] https://www.wi-fi.org/news-events/newsroom/wi-fi-6e-momentum-underscores-need-for-entire-6-ghz-band

- **Education and corporate networks:** Universities and enterprise campuses support large numbers of simultaneous users accessing cloud-based applications, video conferencing, and collaboration platforms, driving sustained high-capacity demand.
- **Industrial automation and digitalisation:** Manufacturing, logistics, and industrial environments increasingly rely on wireless connectivity for mission-critical applications, including robotics, AI-driven operations, and real-time monitoring. These use cases require highly reliable, low-latency, and high-throughput connectivity.

These drivers collectively contribute to sustained and accelerating traffic growth, characterised by higher data volumes, increased device density, and more demanding performance requirements. This trend underscores the importance of ensuring sufficient spectrum resources and advanced wireless technologies to support future connectivity needs.