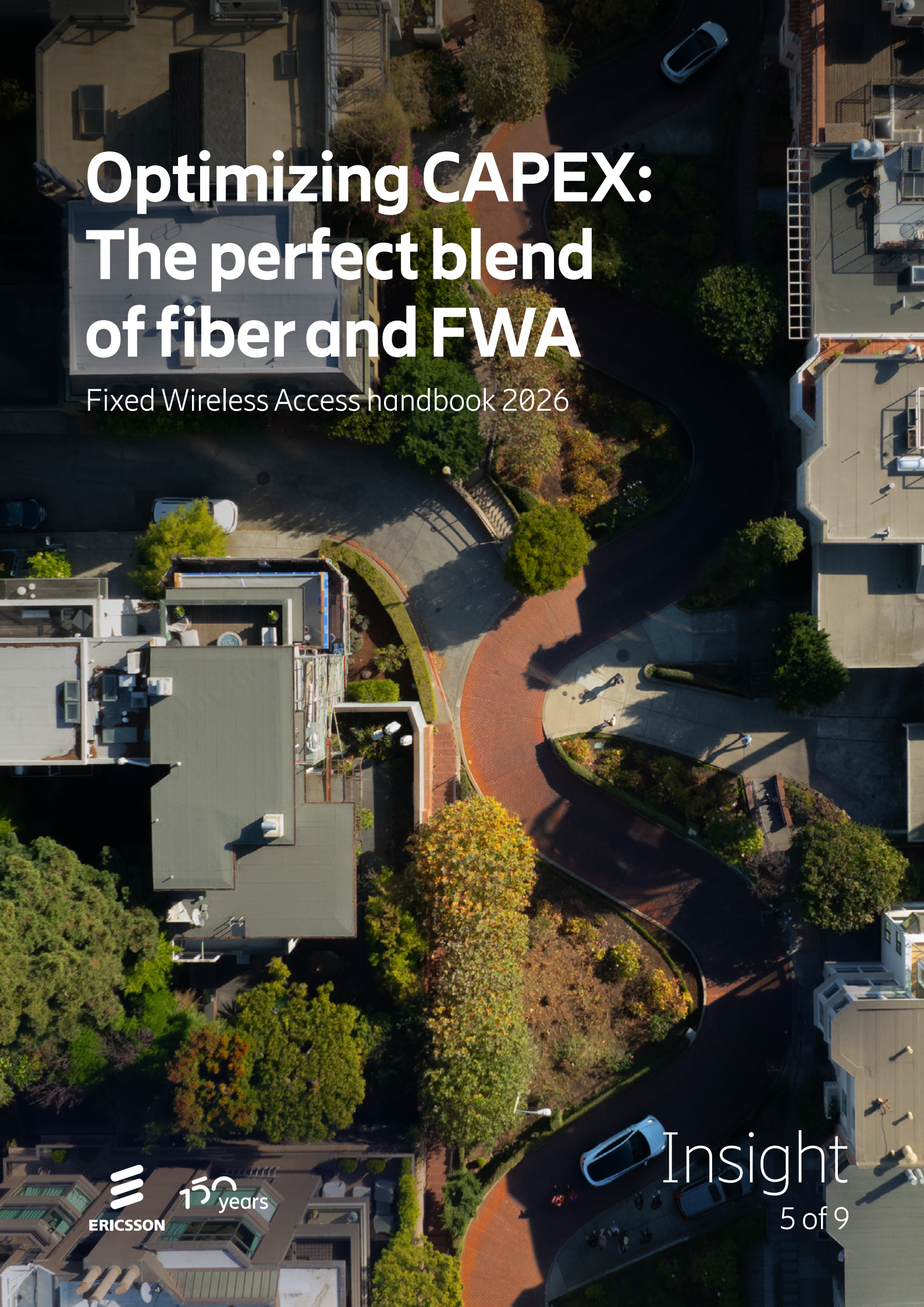


Optimizing CAPEX: The perfect blend of fiber and FWA

Fixed Wireless Access handbook 2026

ERICSSON 150 years

Insight

5 of 9

Optimizing with the right mix of fiber and FWA

1. Increase satisfaction

- NPS for FWA on par with fiber
- Fiber and FWA have highest NPS scope among broadband technologies

2. Fast time-to-market

- Fast time to market with FWA
- FWA first, fiber later for selected areas

3. Maximize return on investment

- Fiber build-out attractive in dense urban areas (<60% pop coverage)
- FWA has light investment profile, attractive in suburban and rural areas (>60% population coverage)

>95%

Fiber and FWA will capture over 95% of broadband growth by 2031

Fiber and FWA will capture over 95% of the fixed broadband growth by 2031 as outlined in Insight 1. As a result of that, blending Fiber and FWA creates an optimized broadband deployment strategy, delivering high customer satisfaction, quick deployment, and strong financial returns. Both technologies achieve top-tier Net Promoter Scores (NPS), with FWA performing on par with Fiber, making them the highest-rated broadband solutions.

FWA provides rapid time-to-market advantages, enabling quick connectivity in targeted regions. This approach is particularly effective when deploying FWA first in under- and unserved areas, followed by Fiber expansion where demand grows. Such flexibility ensures faster access for customers while gradually scaling infrastructure investments.

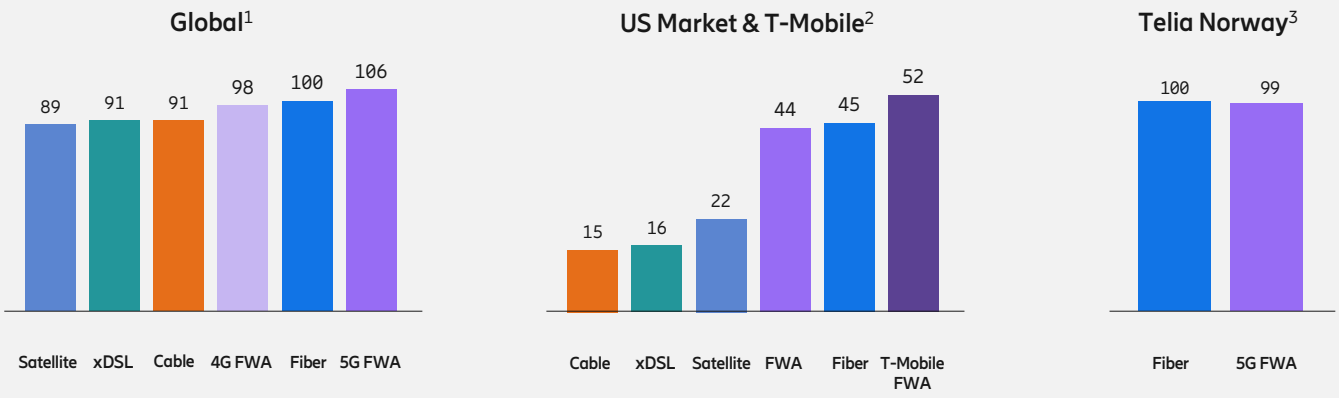
From an investment perspective, Fiber's build-out is attractive in dense urban areas with population coverage below 60%, where its long-term value offsets initial investment costs. In contrast, FWA offers a light investment profile suitable for suburban and rural areas with population coverage exceeding 60%. By leveraging both technologies' strengths, service providers can expand coverage efficiently, maximize returns, and provide high-quality connectivity tailored to diverse market demands.

By leveraging the complementary strengths of Fiber and FWA, service providers can deliver scalable, cost-efficient broadband solutions, with high customer satisfaction while maintaining a competitive edge in the market.

NPS for 5G FWA is on-par or better than fiber

FWA is rapidly becoming a competitive option for broadband, with 5G FWA delivering high customer satisfaction across different markets.

Net Promoter Score (NPS)



Recent Net Promoter Score (NPS) data from service providers own surveys across the world shows that 5G FWA scores highly on customer satisfaction, consistently outperforming traditional fixed broadband services like cable and DSL.

Ericsson ConsumerLab global study shows that 5G FWA has an NPS of 106, in relation to fiber as a benchmark (100), and 4G FWA has slightly lower (98), but still higher NPS score than Cable, xDSL, and Satellite.

In the United States, the story is similar, where 5G FWA significantly outpaces both cable and satellite, achieving an NPS of 44 compared to fiber's 45. T-Mobile USA 5G FWA scores even higher than fiber, with NPS at 52.

In specific service provider cases, such as T-Mobile USA, 5G FWA scores three times higher than cable.

Similarly, in Norway, Telia's 5G FWA nearly matches fiber's high satisfaction level, with scores of 99 and 100, respectively.

These NPS findings highlight that 5G FWA is highly valued by consumers for its high-speed, reliable connectivity. With growing demand for flexible, high-quality internet solutions, 5G FWA provides an attractive alternative to wired options, reshaping the landscape of home and business broadband.

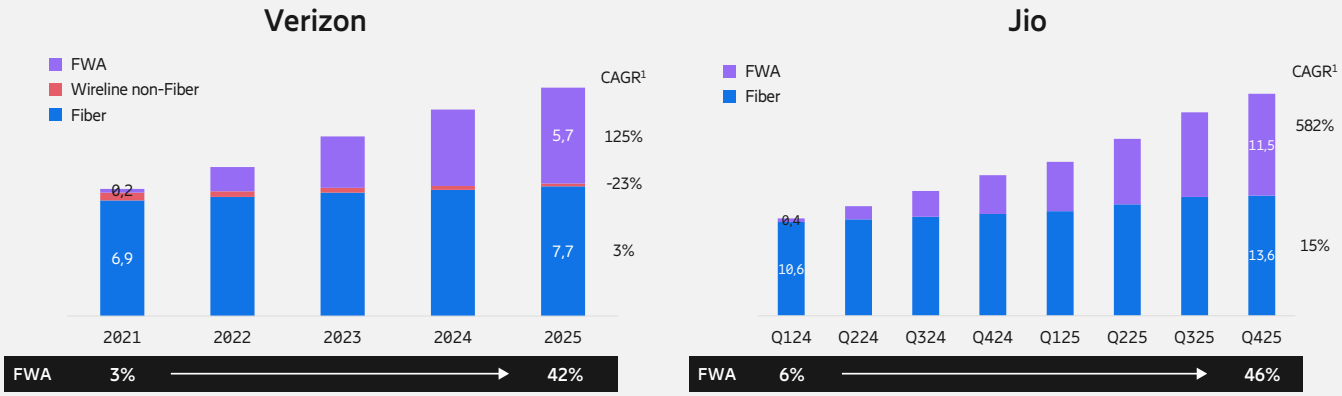
1) Ericsson Consumer Lab, 2024. 2) HarrisX TCS 3Q24-3Q25 NPS. 3) Telia Norway.

Fast time-to-market: a key advantage of FWA

FWA offers a significant advantage in rapid connectivity, with a much faster connection uptake compared to fiber.

Connection uptake for FWA compared to fiber

(Total fixed broadband connections in millions)



Network deployment with FWA is faster than fiber as in most cases, it depends on upgrade of existing sites with new and high-capacity radios. This upgrade process simpler as activities related to site survey, permitting and civil works are consume less time than for fiber. Similarly, the installation of the FWA CPEs at customer premise is faster than with fiber, as often no civil works, cabling and technician visit are required. As a result of that, leading service providers like Verizon and Jio illustrate how FWA accelerates broadband adoption.

In the U.S., Verizon launched fiber services in the mid 2000s and it has been growing its base steadily to 7.7 million connection by 4Q25 in the North East states. With 5G, it launched its FWA services in 2019, which had an accelerated growth once C-band spectrum was awarded and deployed. By 4Q25, Verizon has a base of 5.7 million FWA connections, representing 42% of its broadband base and growing much faster than its fiber base.

Similarly, Reliance Jio has been the fastest growing and larger fiber provider in India. With the launch of 5G, Jio demonstrates the scalability of FWA, achieving approximately 11.5 million FWA connections by Q4 2025, with growth rates and net adds much higher than fiber. During 4Q25, 75% of Jio's broadband net adds were AirFiber. Jio's ambition is to reach 3 million FWA connections per quarter, resulting in an uptake ~3x faster than that of fiber.

FWA's ability to deliver immediate connectivity without the extensive civil works and infrastructure requirements of Fiber makes it a critical solution for underserved areas and rapidly growing markets. With FWA, providers can meet demand faster, expand coverage more efficiently, and deliver connectivity to a broader audience in record time.

1) Compounded annual growth rate.
Source: Service provider website, financial reports

Capital allocation for fixed broadband and mobile broadband networks

This session highlights an Ericsson research evaluation of the market size, adoption, and deployment of 5G and fiber networks covering eight countries with more than 265 million people.

265m	USD 165b	USD 32b	USD 310b
population	CPS fixed and mobile annual revenues 2024	5G spectrum fees	CSP investments 2018-2024

This study

This study leverages annual industry surveys conducted by regulators and policy makers in each of the countries. These are public reports, covering the major communication providers in each country. The uniqueness of these surveys in that it covers a broad set of companies, including public traded companies (typically mobile operators) as well as often privately owned city networks and pure fixed broadband providers. The combined annual revenues of these communication service providers add to a total of approximately USD 165 billion.

The 2018-2024 period analyzed is meaningful from a capital allocation perspective, as it covers most of the 5G deployment cycle. It is also a period of intense fiber deployment, fostered by an expressive level of investments driven by lower interest rates and growing demand of high speed of internet driven by the COVID-19 pandemic. During the period, CSP investments added to approximately USD 310 billion, with an addition of USD 32 billion in 5G spectrum fees.

Industry survey

Communication service providers

- Mobile operators
- Converged operators
- Fixed-only
- City networks
- Public and private

Representative investment cycle

- 5G build-out and spectrum
- Intense period of fiber build out

Regulator data from 8 countries

Canada
Canadian Radio-television and Telecommunications Commission (CRTC)

Denmark
Climate Data Agency (KDS)

Finland
Finnish Transport and Communications Agency (Traficom)

France
Regulatory Authority for Electronic Communications, Postal Affairs and Press Distribution (ARCEP)

Italy
Communications Regulatory Authority (AGCOM)

Norway
National Communications Authority (NKOM)

Sweden
Swedish Post and Telecom Authority (PTS)

UK
Office of Communications (OFCOM)

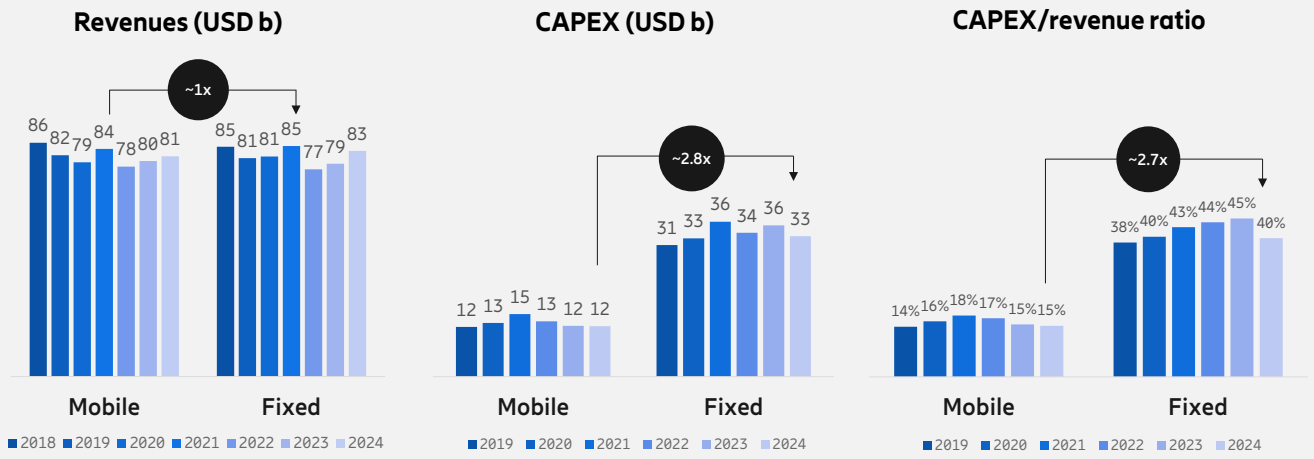
Source: CRTC, PTS, NKOM, ARCEP, OFCOM, AGCOM, TRAFICOM, KDS

Fixed and mobile revenues similar in size, while fixed CAPEX is almost 3x higher

The combined fixed and mobile revenues for the 8 studied countries is very similar. The average fixed broadband revenues and mobile revenues for the period is surprisingly similar at USD 81 billion annually.

Combined 8 countries

(Canada, France, Italy, Norway, Sweden, Finland, Denmark and UK)



On the contrary, the level of investments (CAPEX) is very different. Annual investments in mobile networks were ranging from USD 12 billion to 15 billion (average USD 13 billion), with country variations driven by the 5G investment cycle. For fixed networks, the annual investment levels were above USD 30 billion (average USD 34 billion) for each of the years in the period. While the mobile CAPEX spending declined after 2021 (likely highest 5G investments), the fixed network CAPEX remained somewhat stable at similar levels, although as % of revenues it declined to 40% in 2024.

Comparing the overall period, it is clear to see that the capital intensity (CAPEX to revenue ratio) of fixed networks is higher than that of the mobile networks, reaching almost 3x for 2024.

Source: CRTC, PTS, NKOM, ARCEP, OFCOM, AGCOM, KDS, TRAFICOM, Ericsson analysis.

Fixed CAPEX intensity higher than mobile, in particular for countries with high level of fixed spending

Capital intensity for fixed networks is higher than mobile networks, even when adding total 5G spectrum fees.

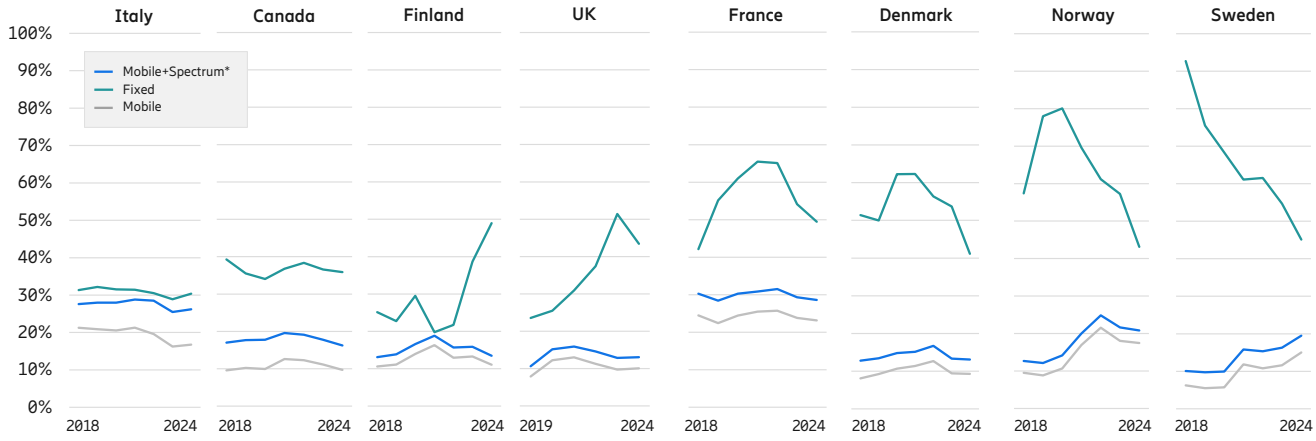
Capital intensity is examined in detail looking at ratio of investment to revenues per country for fixed and mobile networks. Given that a lot of the investments in fixed networks are for passive infrastructure (i.e., laying fiber cables) that have a long life and depreciation time, the investments on mobile networks are incremented with the complete value of the 5G spectrum fees for comparison purposes. In this case, the complete value of the 5G spectrum fees for all operators are added on top of the mobile investments, with the spectrum costs evenly distributed over the seven-year period.

Based on that, it is possible to see that the fixed spending ratio is higher for all examined countries even when including 5G spectrum costs. Italy is the only case where mobile plus 5G spectrum fees come close to fixed networks spending, which is partially explained by Italy having one of the highest 5G spectrum fees globally.

Capital intensity for fixed networks: moderate and intense levels of spending

Regarding the levels of fixed network capital spending, the evaluated countries are grouped in 2 categories. Italy, Canada, UK and Finland have a moderate level of spending, ranging mostly between 30-40% during the evaluated period.
On the other hand, France, Denmark, Norway and Sweden have capital spending ratios mostly above 50% during the period evaluated, although declining in the previous years and still higher than 40% of fixed network revenues.

Capital intensity (Investment as % of revenues), including total 5G spectrum fees*



Fixed network capital spending: moderate (ranging 30-40%)

Fixed network capital spending: intense (ranging 50-70%)

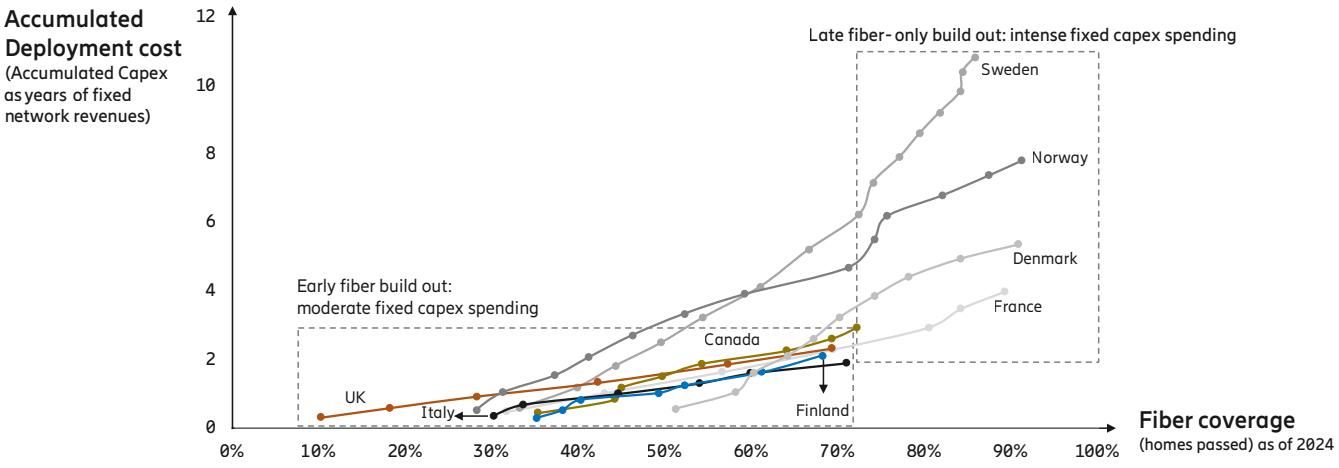
*Total 5G spectrum fees evenly distributed over 7 year period. Source: CRTC, PTS, NKOM, ARCEP, OFCOM, AGCOM, Traficom, KDS, Ericsson analysis.

Fiber deployment costs over the fiber build out cycle

The level of fixed network spending among the studied countries is compared against the progress of fiber deployment, measured by fiber coverage (i.e., homes passed). For this analysis, the evaluated time period is extended to cover as much as possible of the fiber deployment cycle based on regulator reported data. With that, it is possible to see the initial phase (fiber coverage below 35% of homes passed), where data is available for 7 out the 8 countries. On the vertical axis, the fixed network spending is accumulated as a proportion of annual fixed network revenues.

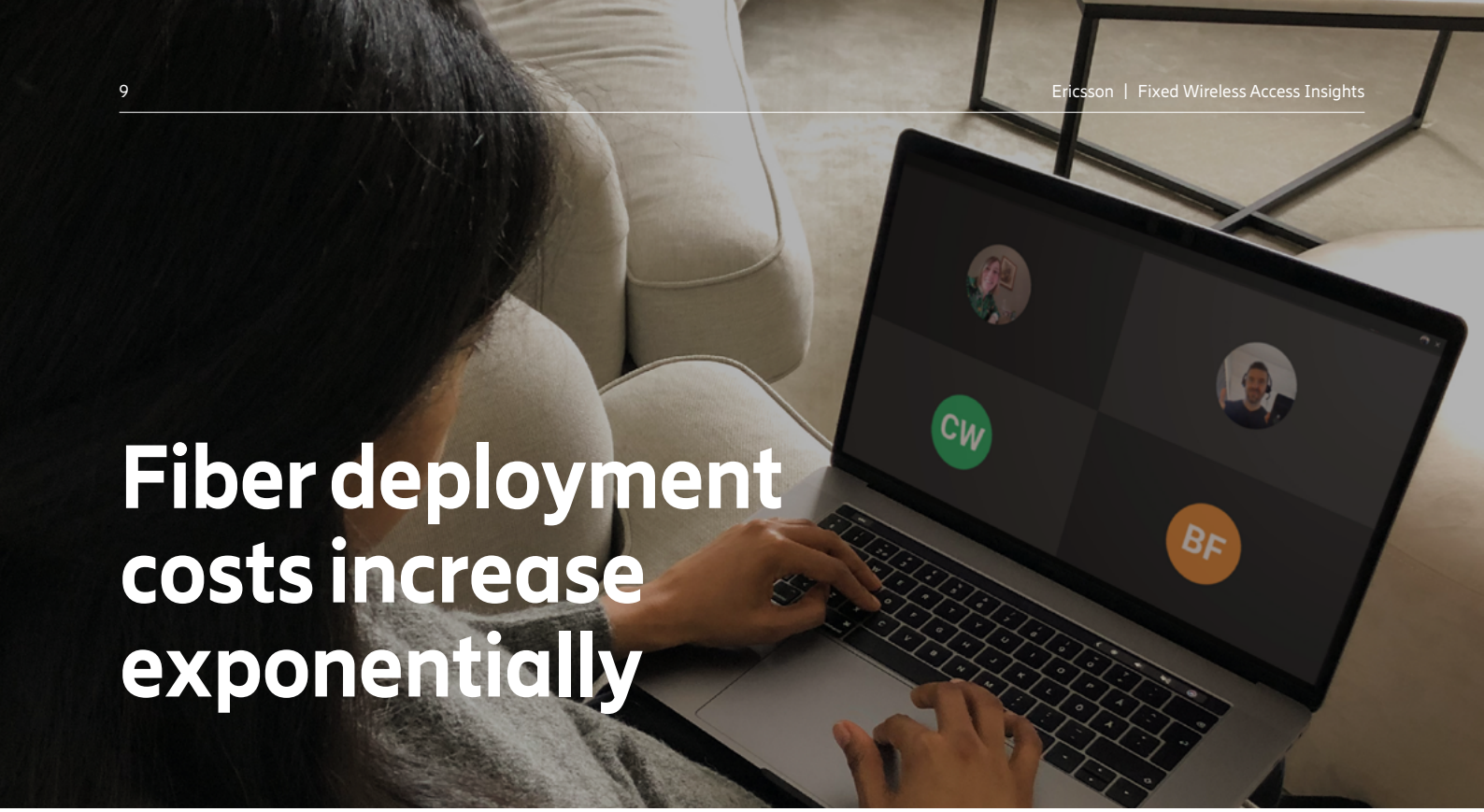
The analysis shows clearly that the countries with moderate fixed CAPEX spending levels are early in the fiber deployment cycle, with most of the fiber deployments below 70% of the homes passed. On the other hand, countries with intense fixed network spending have deployments over 80% of homes passed. In general, the levels of fixed network spending increase significantly once the fiber coverage surpasses 50-60% of homes.

Capital intensity over fiber build-out cycle

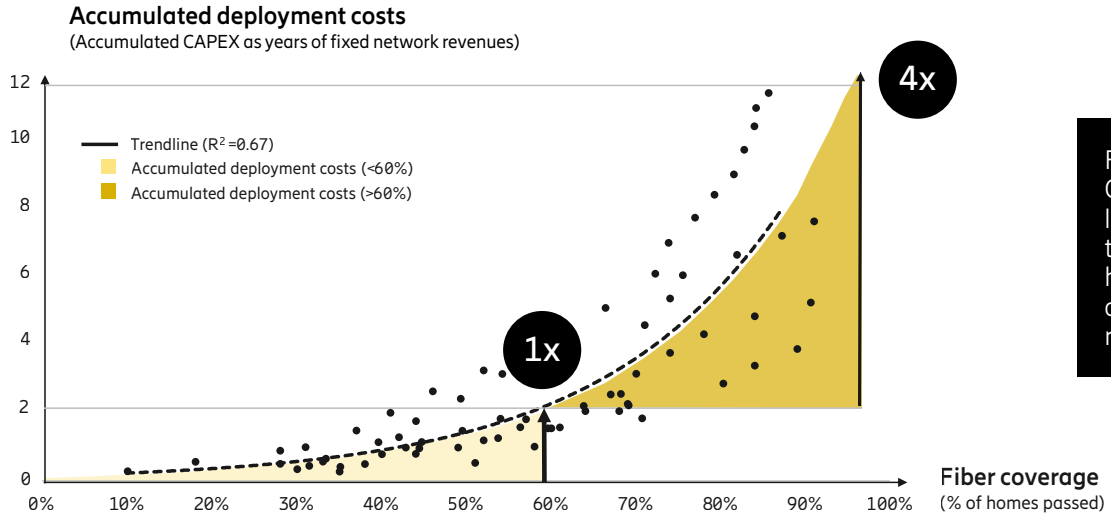


Higher levels of fixed network spending once fiber coverage surpasses 50-60% of homes

Source: Ericsson analysis based on public service providers information



Fiber deployment costs increase exponentially



Four times more CAPEX to cover the last 35% compared to the first 60% of homes passed and declining built-out rate.

With the combined data points for the countries evaluated, it is possible to create an aggregated analysis.

The trend is clear, rising deployment costs as fiber coverage surpass the inflection point of 50-60% of the homes passed. Based on the 8 studied countries, it takes four times more CAPEX to cover the last 35% of homes compared to the first 60% of homes passed.

Source: CRTC, PTS, NKOM, ARCEP, OFCOM, AGCOM, TRAFICOM, KDS, Ericsson analysis.

Optimizing with the right mix of fiber and 5G FWA

As service providers as well as regulators and policymakers devise plans to provide high speed broadband to consumers and businesses, it is critical to leverage a set of principles based on lessons learned from more studied cases.

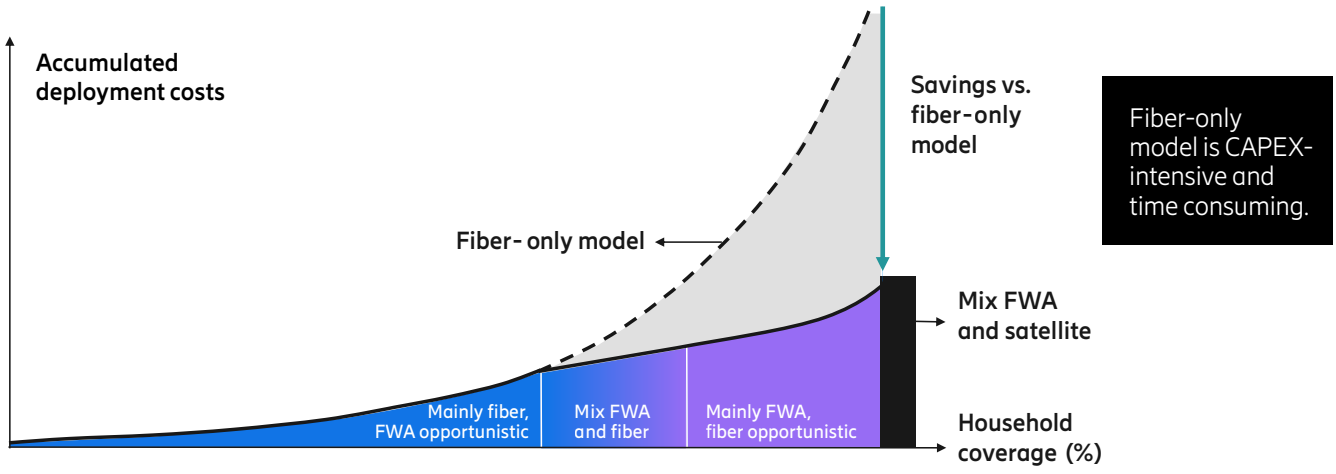
The primary fiber areas are densely populated locations where the build out of fiber is cost effective as well as time efficient. For the eight countries studied, this is reached around 50-60% of the household coverage. After that point, there could be areas where service providers start with FWA to preempt fiber competitors. This would typically be around 50-70% of the household coverage. Once FWA market share is secured, service providers could evaluate network evolution alternatives for the FWA users, including migration to fiber.

The primarily locations for FWA would be after 70% of the household coverage, where fiber deployment costs are high and time consuming. In these locations service providers with a strong mobile site grid and 5G mid-band spectrum assets enable a fast and cost effective case for 5G FWA, at much lower levels than a fiber-only model.

The last remaining homes would be served by a mix of FWA and satellite. The size of this segment depends on a variety of factors, such as mobile site grid and topography. Many countries have around 97-98% mobile broadband coverage, which means that service providers can upgrade existing site grid to provide high speed FWA services. Often the low density of homes is a limiting factor for a commercial FWA deployment and partial government incentives can make a difference. Mountainous terrains and remote locations could be limiting factors for mobile coverage, which would instead favor satellite-based solutions.

Finally, it is critical to remember that the consumer need for high-speed broadband is tremendous and they will look for solutions available. There are cases of FWA in densely populated areas that could have been served by fiber, similar to how satellite is used in suburban and urban areas. Likewise, service providers with fast and bold deployment may capture market share area of the expected technology for a certain location.

Principles for fixed broadband coverage build-out (illustrative)



Leverage existing "last mile"

The economics for network deployment for fiber and FWA can be divided in two main investment areas: network and customer premises.

Drivers	Aggregation node (active equipment)	Last mile (passive elements)	Customer premises (active equipment)
Fiber	Optical Line Termination (OLT) $$	Fiber (aerial or trenched) + Rights of way $$$$$ + Install	Optical Network Terminal (ONT) $ + WiFi router $$ + Install $$$
Fixed Wireless Access	eNodeB (Baseband+Radio) $$$	Mobile Site/Tower + Spectrum $$	CPE modem $$$ + WiFi router $$ + Install $
Economics	• Depreciation: 5–7 years • Re-use of mobile sites offsetting higher unit cost for eNodeB compared to OLT — cost for new mobile tower could be offset using government incentives • Time consuming to build fiber access (i.e., permits and roll-out) compared to FWA coverage as it re-uses existing mobile sites and undeployed spectrum	• Depreciation: 20–30+ years	• Depreciation: 5–7 years • Simpler and faster installation of FWA CPE model (including self-install) compared to ONT, offsetting unit cost differences

Relative incremental cost $ Low $$$$$ High

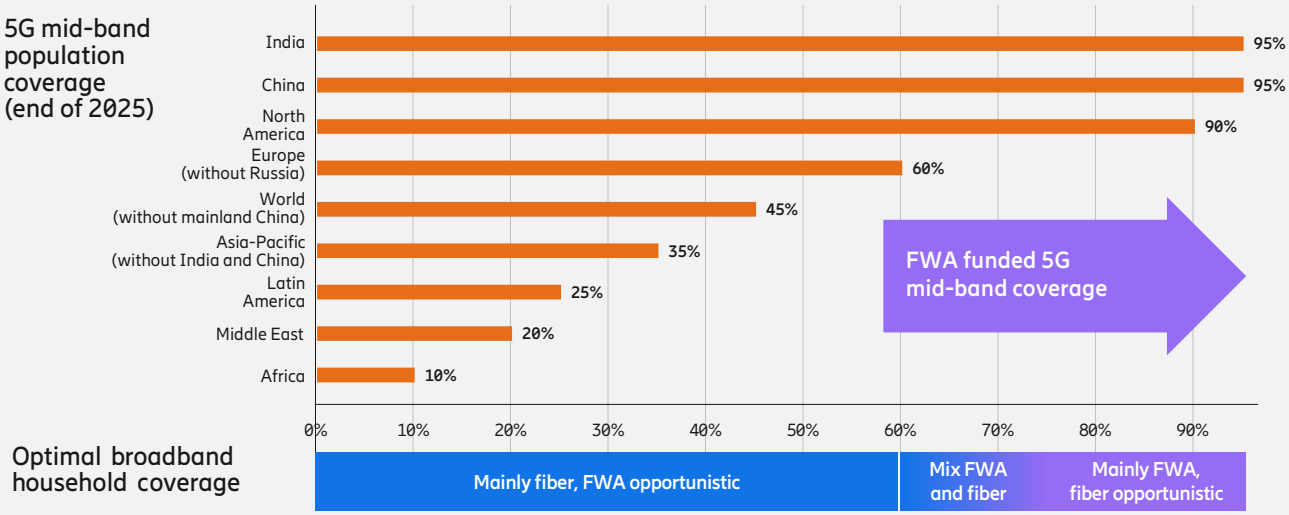
Network investment: aggregation node and last mile

The last mile is the most capital intensive and time-consuming part for fiber and mobile networks, with depreciations often spread over 20-30 years. FWA has an advantage as it in most cases leverages mobile tower/sites that have already been built. Spectrum assets are often financed by MBB business and not totally deployed across the network (i.e., high-capacity spectrum bands typically deployed in densely populated areas for MBB). As a result of that, network economics for FWA is more economically attractive than fiber even if high capacity eNodeBs can be more costly than OLTs.

Customer premises: labor and device price

Although 4G FWA CPEs are as price competitive to ONT levels, 5G FWA CPEs are still on a price declining curve. FWA can still be competitive to ONT as lower and faster (including self-install) installation costs offset the higher unit cost for 5G CPEs compared to ONT.

FWA potential captured with 5G mid-band coverage



Replicating India and North America FWA success by building 5G mid-band coverage

From the framework for optimal residential fixed broadband coverage, it is possible to identify primary areas for fiber and FWA. To capture the FWA opportunity, it is critical to have coverage of 5G mid-band, which will deliver high speeds and capacity for competitive high-speed 5G FWA services. Leading operators with high-growth and ambitions of 5G FWA in the United States and India have done exactly that. These service providers deployed 5G mid-band exceeding 90% of population coverage, covering the areas for primary FWA opportunity by the end of 2025.

At end of 2025 the 5G mid-band coverage was estimated to be at 45% of the world population without mainland China. Many regions such as Europe, Latin America, Middle East and Africa and parts of Asia have 5G mid-band coverage only in densely populated areas, primarily to serve smartphone (MBB) users.

Replicating the success from India and USA with FWA funding 5G mid-band coverage

FWA can narrow this 5G mid-band coverage gap by funding the upgrade of existing sites with high-capacity radios outside city areas. Service providers with a holistic capital allocation approach can determine – at a detailed local level – where it is more suitable to deploy fiber or FWA. This enables them to optimize the delivery cost per home, identifying the breaking point for FWA areas instead of fiber. As FWA cost per home passed is lower than fiber when upgrading existing sites with 5G mid-band, it is possible to serve more homes with the same CAPEX investment. At the same time, by leveraging FWA, service providers can achieve faster coverage, deterring competitors from making fiber investments in the same area.

Moreover, the increase in 5G mid-band coverage also benefits smartphone users that will perceive faster speeds and superior performance. Such a broad approach may also include the use of government subsidies, perhaps including a mix of fiber and FWA to meet service obligations. The main benefits of this approach include:

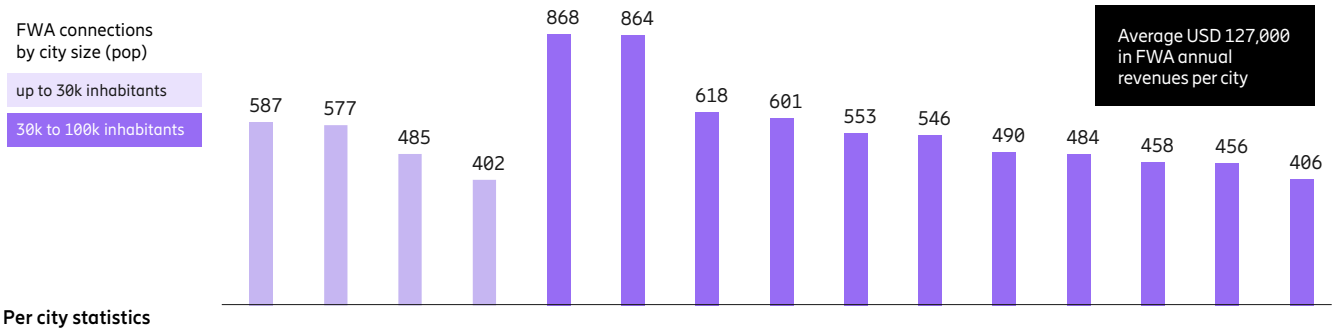
- Lowest CAPEX per home for high-speed broadband using fiber or 5G FWA.
- Fast time to market with FWA.
- Mobile site synergies with capacity configured for FWA and MBB, with one-site visit (first time right).
- Improved MBB experience in suburban and rural areas as consumers also get mid-band coverage.

Source: EMR Nov 2025

5G FWA growth in rural markets with 5G mid-band

As an example of 5G FWA growth and uptake with 5G mid-band deployments in rural areas, we highlight a case from a service provider in Latin America. This CSP is a leading fiber provider in the country and it is using 5G FWA as a complement to its fiber network.

5G FWA CSP Latam: connections in smaller rural markets one year after launch



Per city statistics															
5G midband sites	1	2	1	2	9	5	3	3	4	3	2	9	2	4	4
FWA revenues (USD k/yr)*	133	131	110	91	196	195	140	136	125	123	111	109	104	103	92

Fast uptake and revenues in smaller rural markets driven by 5G mid-band coverage

In smaller rural cities with populations below 100 thousand inhabitants, this CSP deployed 5G FWA on mid-band to capture the high-speed broadband opportunity. Within one year of launch, it gained over 400 5G FWA customers per city. Considering the ARPU level of its lowest FWA tariff plan at USD 19 per month, it is estimated that the average annual FWA revenues per city is at USD 127 thousand.

Given that many of these cities have fewer than 4 mid-band sites per city, it is possible to see a positive business case for 5G mid-band deployment, benefiting not only FWA but also MBB users.

Starlink growth demonstrates that the demand for fast and reliable broadband is strong in rural areas

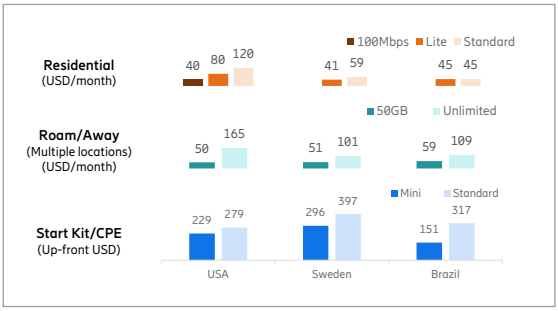
Starlink has achieved a steady growth of satellite broadband connections, reporting over 9 million connections as of December 2025.

Connections

>9m
Starlink satellite broadband connections as of Dec 2025[1]

30m
Satellite broadband connections by 2031[2]

Starlink offering plans[3]



Starlink connections vs 5G coverage
(Example for Latin America[4])

5G coverage (% homes)

City size (pop)	0-25%	26-75%	76-100%	Total
>500k	0%	0%	7%	7%
200k-500k	0%	2%	6%	8%
100k-200k	3%	3%	4%	10%
30k-100k	22%	3%	3%	27%
0-30k	47%	0%	0%	47%
Total	72%	8%	20%	100%

Lessons learned

1. Satellite broadband expected to represent 2-3% of fixed broadband connections by 2031
2. Demand to pay premium for fast and reliable broadband, in particular in hard to reach locations
3. Willingness to pay for CPE and to perform/arrange install of outdoor/rooftop CPEs
4. Commercial models tailored to specific segment, with premium for multiple locations
5. Although majority of the Starlink connections are in remote areas (i.e., smaller cities with low 5G coverage), Starlink is capturing 5G FWA potential connections in denser areas (i.e., large cities with 5G coverage)

Ericsson estimates that the satellite broadband segment will continue to grow, reaching about 30 million connections by 2031, representing about 2-3% of the overall global broadband connections. By comparison, FWA connections are expected to reach 350million in the period.

Natural market for Starlink growth: remote underserved locations

Starlink's growth is driven by demand for fast and reliable broadband, particularly in hard-to-reach areas without alternatives. In these remote locations, Starlink is able to capture a high share of the market, despite offering a premium price plan above average broadband rates. As shown by statistics for a Latin American country, 69% of Starlink connections are in smaller cities with fewer than 100,000 inhabitants. Currently, in these locations, 5G coverage of homes is less than 25%. In such locations, consumers are willing to pay a premium, including the upfront cost of the device and the installation of outdoor antennas that require an unobstructed view of the sky.

Adjacent markets for Starlink growth

Starlink connection growth is not only in remote areas. At the Starlink website, it is possible to see that some large cities are out of capacity for Starlink services, as demand has exceeded capacity. As an example, in the Latin American country depicted, 20% of Starlink connections are in cities with over 76% 5G coverage.

Although some of these Starlink connections could be from users in remote locations, businesses looking for backup solutions or technology enthusiasts, it shows that there is an unmet demand for high-speed internet. Often, best effort FWA offerings cannot compete adequately. For such cases, it is recommended to have at least 5G FWA speed tiered offerings based on outdoor to capture this demand.

Last, it is also important to highlight how Starlink is positioning Roam/Away "multiple location" service at a premium compared to the residential service, showing the value of mobility.

Source: 1) Starlink Progress report 2025, 2) Mobility Report Nov 2025, 3) Starlink website, 4) Regulator data, Ericsson analysis.

Read all nine insights on capturing the value of 5G FWA

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