Extracted version

Boost FWA adoption with integrated business processes

Fixed Wireless Access handbook 2025

Insights

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Beyond technology

Successful FWA deployments require coordination and shared decision-making across end-to-end processes and organizational boundaries.

Cross-functional teams to drive the FWA businesses on an end-to-end and agile manner

From the initial strategy and planning processes, having a holistic view that captures and considers FWA an integral part of a service provider's business decisions is critical. This initial step includes key activities such as identifying the addressable market for FWA and selecting target segments and locations, which provide inputs for Capex allocation and network deployment plans.

Once the FWA market opportunity has been identified, the next step is to define suitable FWA product(s), including potential value-added services (such as video and TV services), the business model, the technical solution (including CPE choices and installation options), and price positioning. The FWA offering needs to consider the local fixed broadband market dynamics.

For the sales and go-to-market processes, it is important to understand that FWA equates to fixed broadband services, where geo-marketing plays a defining role. At the same time, it is critical to adapt processes for sales (including incentives) and user qualification for FWA services.

The sales process for FWA shall leverage triggers for acquiring or upgrading broadband services. For example, these could include new homeowners and tenants (e.g., using real estate agencies for promotions), new content, or home devices (e.g., promotion on electronic retailers). Other traditional sales tactics for home broadband sales include geo-marketing, such as door-knocking and targeted advertising, and promotions from service providers as new 5G mid-band coverage arrives in a new neighborhood.

The delivery step of FWA services includes network provisioning and installation, sometimes including options for self-installation in addition to technician installation. Once the service is activated, it is time to monitor FWA performance, site utilization, and usage behavior – combining typical MBB KPIs and considering the fixed broadband paradigm.

FWA is often a new, adjacent service for service providers and initially requires new skills and tight monitoring across organizational boundaries. Some service providers implement cross-functional teams to regularly monitor progress and take corrective actions to ensure continued FWA growth and uptake.

FWA home qualification and provisioning

For tiered, speed-based broadband offerings, it is important to know the likely speed and capacity available to the consumer in each location.

Since the FWA consumer is in a fixed location, it is possible to estimate the load in the network from FWA and calculate the available speed options.

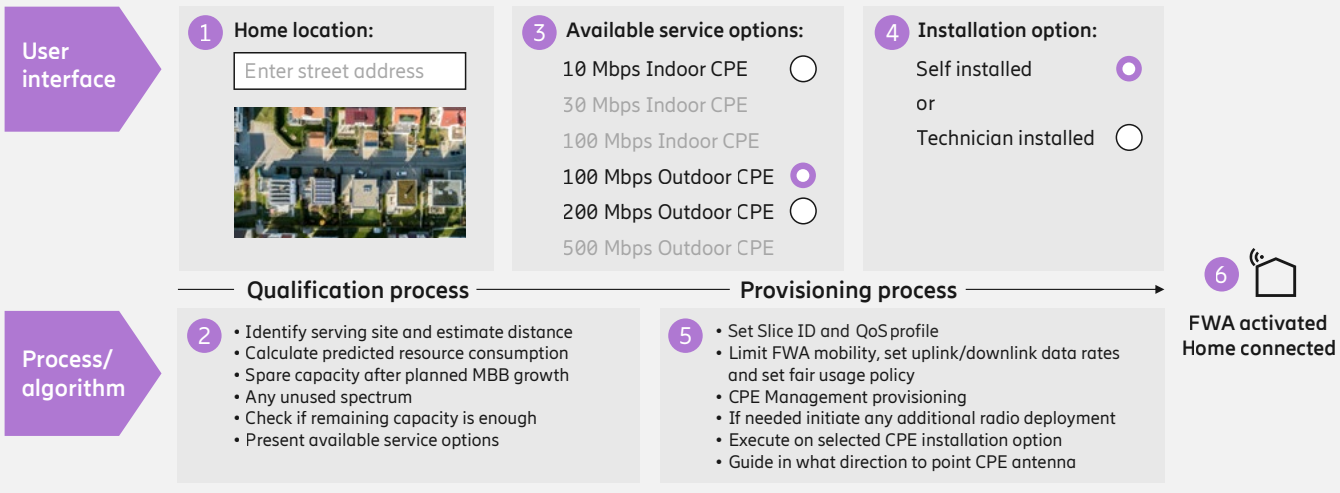
The first step in the FWA home qualification process is to enter the address for the household. Next, your home is matched with the serving site, with radio condition estimation, determining what resource consumption is likely for this household. Calculations are based on the spare capacity available after planned MBB growth; any unused spectrum could be activated by installing more radio equipment if needed.

Several different service options are presented based on the radio resources available to the household. These include the CPE type (indoor or outdoor) and the speeds that can be achieved at the household's location. If an outdoor CPE is selected, the next step is to choose the installation option: self-installation or technician installation.

When all the input from the consumer has been received, the provisioning process starts. The new FWA user will be assigned attributes according to the service options selected. These include the slice identification and QoS profile, authorized geographical location, data rates, and fair usage policies.

The process can be speedy if there is free spectrum and a tower nearby. If radio hardware is already in place, all that is needed is to ship the CPE, and if the technician installation option is selected, schedule a site visit. The household should get FWA broadband service within a matter of days.

FWA enables very fast time to market (1–7 days)



FWA deployment and evolution options

The starting point: status of 5G deployment

The status of a service provider's 5G deployment is the starting point of FWA network evolution. For example, the primary focus for 5G deployment for a typical US service provider has been the addition of mid-band spectrum (i.e., TDD bands above 2.3GHz). The large service providers expect to deploy that capacity for a large part of the network, with some already reaching 90 percent of population coverage. Other markets follow similar mid-band deployment strategies, such as China, Korea, and India, while others are still lagging on mid-band deployment. In addition to mid-band deployments, mmWave spectrum in the US has been primarily added for venues (e.g., stadiums, airports) and high-traffic locations (e.g., Times Square in New York City). Given this 5G deployment, FWA-eligible areas are typically suburban and rural, with a large share of the mid-band capacity allocated for FWA. Eligible areas for FWA are more restricted to protect the MBB traffic and user experience for dense urban and urban areas.

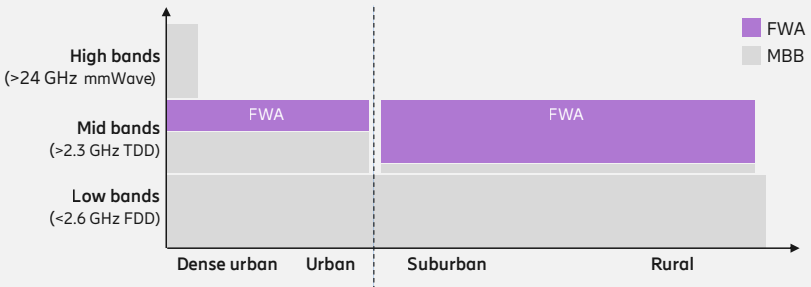
Network evolution: multiple complementary options

Service providers have multiple complementary network evolution options to add more capacity and performance for FWA. From the customer premises, migration from indoor CPEs to outdoor CPEs will add significant capacity because of high antenna gains and reduce attenuation losses, particularly for users in poor radio conditions.

From the radio access node standpoint, new technological improvements such as 5G Standalone (SA) and Carrier Aggregation will bring capacity and performance benefits. In addition, deploying high-capacity radios (e.g., MU-MIMO) and sectorization could also significantly increase the capacity. The capacity of the existing site can also be augmented with the deployment of additional spectrum bands, with mmWave spectrum being one of the most attractive given the large bandwidth available. It is important to add that although mmWave will offload mid-band capacity from line-of-sight (LOS) FWA users, the non-LOS users will also benefit from all mid-band capacity allocated for these users.

Apart from that, additional capacity could be added by site densification. Site densification could be done by adding small cells and macro sites. Most of the costs for new sites are related to passive infrastructure, which can be mitigated by using tower companies and government incentives if applicable to FWA areas. Finally, if the service provider has reached high market share of FWA users, there could be also an option to build a fiber access network in case it is financially attractive given considerations for household density, terrain, permitting and labour cost.

FWA deployment (example)



FWA dense urban – urban

- Target: challenge fiber monopolies, older building without wiring, SMEs
- Advantage: mid-band spare capacity until MBB traffic picks up
- Service providers: mobile-only

FWA suburban – rural

- Target: DSL replacement, FWA first before fiber, cable/fiber monopolies
- Advantage: FWA to fund mid-band deployment. Enhance MBB experience
- Service providers: mobile-only and converged operators (FWA-only service provider for rural areas)

Capacity evolution options

Spectrum
More spectrum on existing site (e.g., mmWave)

Migration
Migrate to fiber if financially attractive

CPE
Migrate heavy/cell edge users to outdoor CPEs

RAN
Deploy latest technology and features (e.g., 5G SA)

Densification
Build additional sites (e.g., macro and small cells)

Home broadband usage remains video and downlink-centric

Household broadband is dominated by video and entertainment usage. The main applications are video streaming, music streaming, gaming, social media, internet browsing, and downloads. Since the start of the COVID-19 pandemic, there has been an increase in work and study from home, which includes voice, screen sharing, cloud storage, and video conferencing. Overall household data consumption depends on the number of people per home. The illustration shows examples of required data rates for different applications (source Cartesian 2021 and Ericsson Technology Review, 2021).

Data rate

The data rate requirement depends on the quality of the video, which in turn depends on the resolution, frame rate, and encoding quality. Modern video servers have content coded in multiple qualities, and end-to-end protocols switch between these, depending on the data rate experienced by the receiving client.

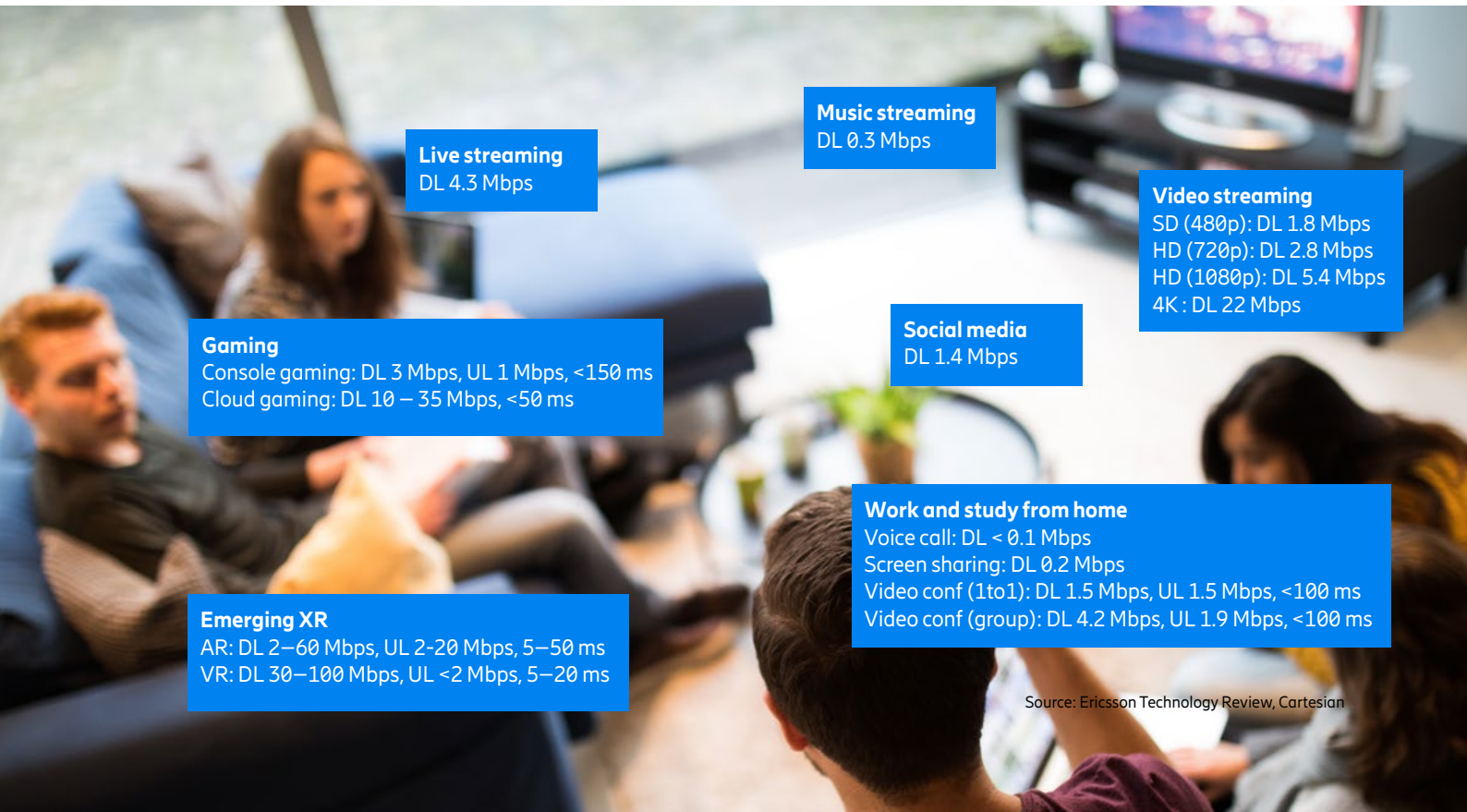
Video providers work with rather big device buffers to avoid quality degradation when network conditions vary. For example, Netflix typically strives to build up a 90-second buffer. With YouTube leading the way, video providers can rather accurately predict how each consumer will continue watching the shows once started, which means that significant buffers (up to one hour) of 'good' data could be built up using free capacity. This relieves the dimensioning requirements since a longer time interval than the actual peak can be considered.

Delay

The absolute delay of starting the play out is flexible: one or a few seconds is acceptable. However, a low delay is still desirable to quickly get up to speed (say 10 Mbps) with TCP after possible link interruptions.

Direction

The FWA household traffic is highly downlink-centric, as video streaming is the dominant service. Even future emerging XR applications for augmented-, virtual- and mixed-reality for gaming and volumetric video are likely to remain downlink-centric, with requirements not exceeding 100 Mbps and with many efforts to optimize and lower data rates. The uplink must still support the application signaling to get the video started, have a relatively high rate of TCP acknowledgments, and have reasonable experience for uploads and uplink webcam-type streaming.



Source: Ericsson Technology Review, Cartesian

Broadband usage growth trends stabilize

Broadband usage behavior and traffic profile are starting to stabilize after the effects of the COVID-19 pandemic and the increased working-from-home behavior. Analysis of recent traffic data from the USA, UK, and Italy provides insights into the continuing influences and trends arising in the past four to five years.

Despite the USA, UK, and Italy having very different home broadband usage levels, the average monthly data traffic growth analysis shows that the annual growth rate stabilized after the steep growth in 2019-2020. For the last 2 years, most of the data growth has been around 10 percent annually, slightly higher in the past year for Italy (14 percent) and US Commercial (16 percent).

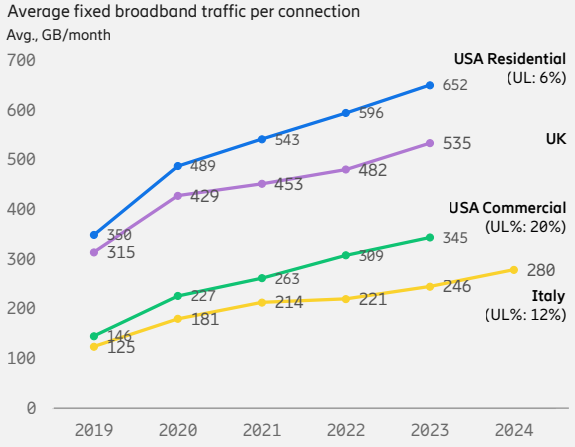
Most measures show a clear downlink usage behavior regarding the share of downlink and uplink traffic. Aggregate traffic data from Italy also shows that most home broadband traffic remains downlink-oriented, and the uplink/downlink ratio has remained stable throughout the six-year period, with downlink representing close to 90 percent. In the USA, residential users consume almost double the commercial users. However, commercial users have more uplink traffic (~20 percent) than residential users (~6 percent). This is driven by residential users consuming video streaming and commercial users working with file transfer, cloud applications, and video conferencing.

Complementary broadband usage profiles.

As explained earlier, the residential and the commercial broadband businesses are complementary, as commercial busy hour usage is during the daytime (i.e., working hours) and residential broadband is in the evenings. This insight is illustrated in the OpenVault Broadband Insight report for 2024, where US residential customers have a concentrated busy hour at 9 pm, while commercial users have a flatter busy hour at noon.

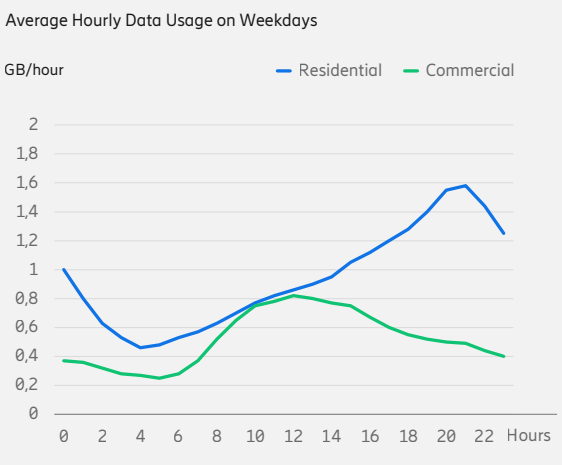
Considering 1.6GB usage during busy hours for residential users, approximately 7 percent of the daily traffic is consumed during busy hours. For commercial users, the busy hour consumption is 0.8GB, which also results in 7 percent of daily traffic during busy hours.

Broadband usage trends stable in past 2 years



Source: AGCOM, Ofcom, OpenVault, Ericsson analysis.

Complementary profiles for business and residential



Source: OpenVault 2024

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

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