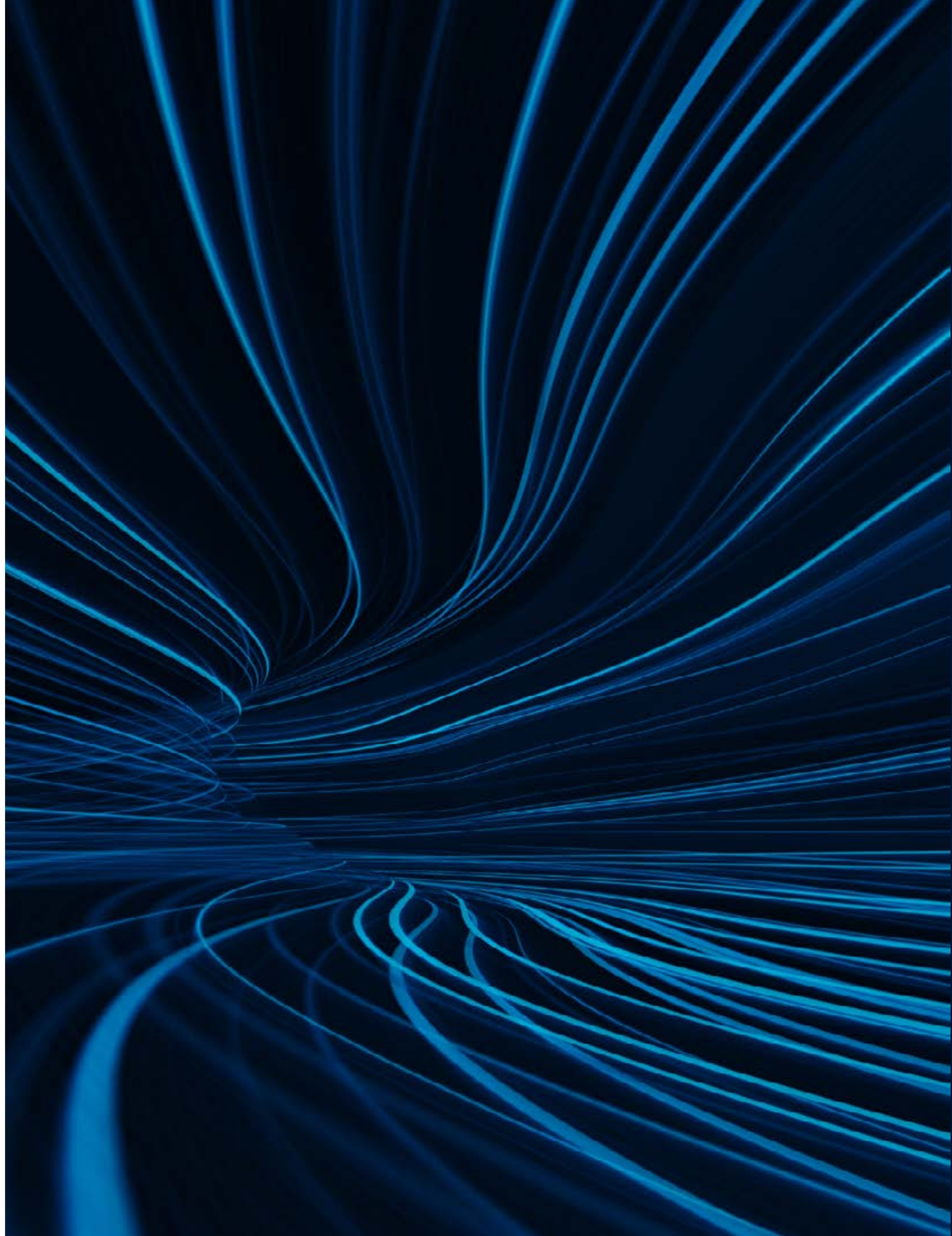
2025 Edition

preseem

ISP NETWORK REPORT

Your guide to metrics, trends, and industry benchmarks for fixed wireless and fiber network providers across subscribers, vendors, and equipment.

Contents



Foreword

Navigating Complexity: Proactive Insights for Regional ISPs

The landscape of broadband networks continues to evolve rapidly, driven by intense competitive pressures, merger and acquisition activity, rapid technological advancements, and increasing subscriber demand for reliable connectivity. But, in this rapidly changing environment, it seems hardly possible to avoid reacting to systemic change, new technologies, market pressures, and customer demands.

At Preseem, we know there is a better way. We are committed to helping regional Internet Service Providers (ISPs) take a more proactive approach to managing their access network and subscribers. We believe this is how regional ISPs will remain competitive, streamline operations, spot growth opportunities, and drive efficiencies across their support and network operations teams—all while delivering the best subscriber experience possible.

The 2025 Preseem ISP Network Report leverages our comprehensive data pool to deliver valuable insights into the state of fiber and fixed wireless networks. This includes subscriber metrics on Quality of Experience (QoE) across technologies, hardware comparisons, vendor-specific analyses, and operational performance benchmarks. These insights provide ISPs with real tools to measure their performance against industry peers and identify opportunities for improvement.

Thank you for being part of this journey to improve regional broadband connectivity. We hope the insights within this report help you make informed decisions to enhance your network and ensure an excellent experience for your subscribers.

Sincerely,

Dan Siemon, CPO at Preseem (by Aterlo Networks)

DSiemon

Executive Summary

Preseem's annual ISP Network Report uses our extensive data set and operator surveys to provide a unique view into access networks across providers and different kinds of equipment, covering both fiber and fixed wireless.

Key insights from this year's edition include:

7 Mbps When Active

The average fixed wireless subscriber uses around 7 Mbps when active (1Y 7.5%↑)

Speed Plans

Speed plans over 100 Mbps often sit idle

Data Usage

The average fixed wireless subscriber uses 12.7 GB of data per day (1Y 8%↑), with the median user up 12%

Fiber NEW

For the same speed plan, fiber and wireless users have a remarkably similar experience

Consumer Habits

Many users don't consume much more data as their speed plan increases

Improved Latency

Latency has improved year over year, indicating that operators are keeping up with consumer demand

Overview

Welcome to the 2025 Q1 edition of the Preseem ISP Network Report!

By downloading this report, you've demonstrated your commitment to staying up to date with the latest trends and data in the industry. You'll also be able to compare your network's performance against ISPs worldwide, giving you unique insights that we hope will benefit both your business and your subscribers.

Preseem provides one platform with dozens of pre-built integrations to help fixed wireless and fiber ISPs gain actionable access network and subscriber insights for all of their teams, all in one place. As part of this work, we collect billions of metrics from ISPs every day — detailed metrics on subscribers, equipment, and overall network performance from our customer base of hundreds of ISPs around the world. We use our huge data pool to present an exclusive and in-depth analysis of the fixed wireless and fiber business across vendors, manufacturers, and different kinds of equipment. We've added even more exclusive insights to this year's edition, including the debut of fiber metrics and their comparison to fixed wireless results. You'll also find all-new industry benchmarks drawn from our first-ever ISP Operations Survey.

The goal of this report is to show the real-world experience of fiber and fixed wireless subscribers, networks, and equipment. We hope this report is useful as a way to benchmark your ISP in the wider broadband ecosystem, and that it also helps others understand subscriber access networks.

Like all big data sets, there are possible biases in this data. We've done our best to be agnostic, but this is not a scientific paper that controls for all confounding effects or uses other scientifically rigorous methods. Nevertheless, we believe this presents a solid, real-world view of the ISP industry.

What's New

If you want to jump to some new highlights, check out:

Fiber Highlights, page 9

Operator Metrics, page 10

Fiber Latency, page 20

SIDEBAR

Peak Vs. Off-Peak

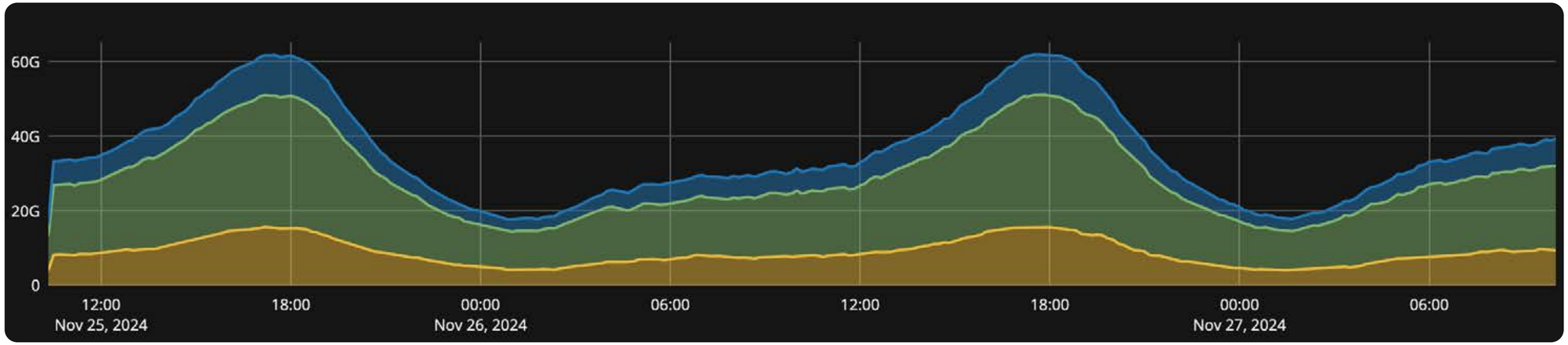
Most networks exhibit great variation in their load during the day.

Given that performance typically only degrades when the network is busy, simple numbers like the average rate for a day, hour, or minute are essentially useless when trying to measure the overall subscriber experience or network performance.

Many of the metrics presented in this report are taken at “peak time.” There are many simple and unsatisfactory methods to determine peak time (such as approximating “prime time”), but these methods fail to capture variation within those periods.

Preseem’s approach is to calculate the minutes in the day with the highest demand (not just throughput) and use the metrics at these times to show true network performance.

As such, the numbers presented in this document aim to represent the typical subscriber experience when the highest number of subscribers are trying to use the service and performance is at its worst.



SIDEBAR

Percentiles

Throughout this report, we use several statistics to describe the data sets. These include stats like average, maximum, and percentiles. Average and maximum are straightforward, but what's with this percentile stuff?

Average and Max

Average is a simple statistic that we all use every day but which can actually be very deceptive. For example, if you and Jeff Bezos are the only people in the room, then the average person in the room has a net worth of over 100 billion dollars. Sounds good, but you can see how this is misleading.

Similarly, using the maximum value as a way to summarize a data set can also paint a misleading picture. For example, the maximum value of your net worth and Jeff Bezos' is 219 billion dollars (as of this writing!)

Percentiles

Percentiles are another tool to summarize a data set, and are particularly useful when simpler statistics are misleading.

Imagine you have the following 11-item data set:

5,100,1,2,2,4,5,6,3,4,2

The average of this data set is 12.18 and the maximum is 100. Neither of those statistics are very useful. As an alternative, consider the 50th percentile (aka the median or P50). To calculate the 50th percentile, we first order all the numbers from smallest to largest to get:

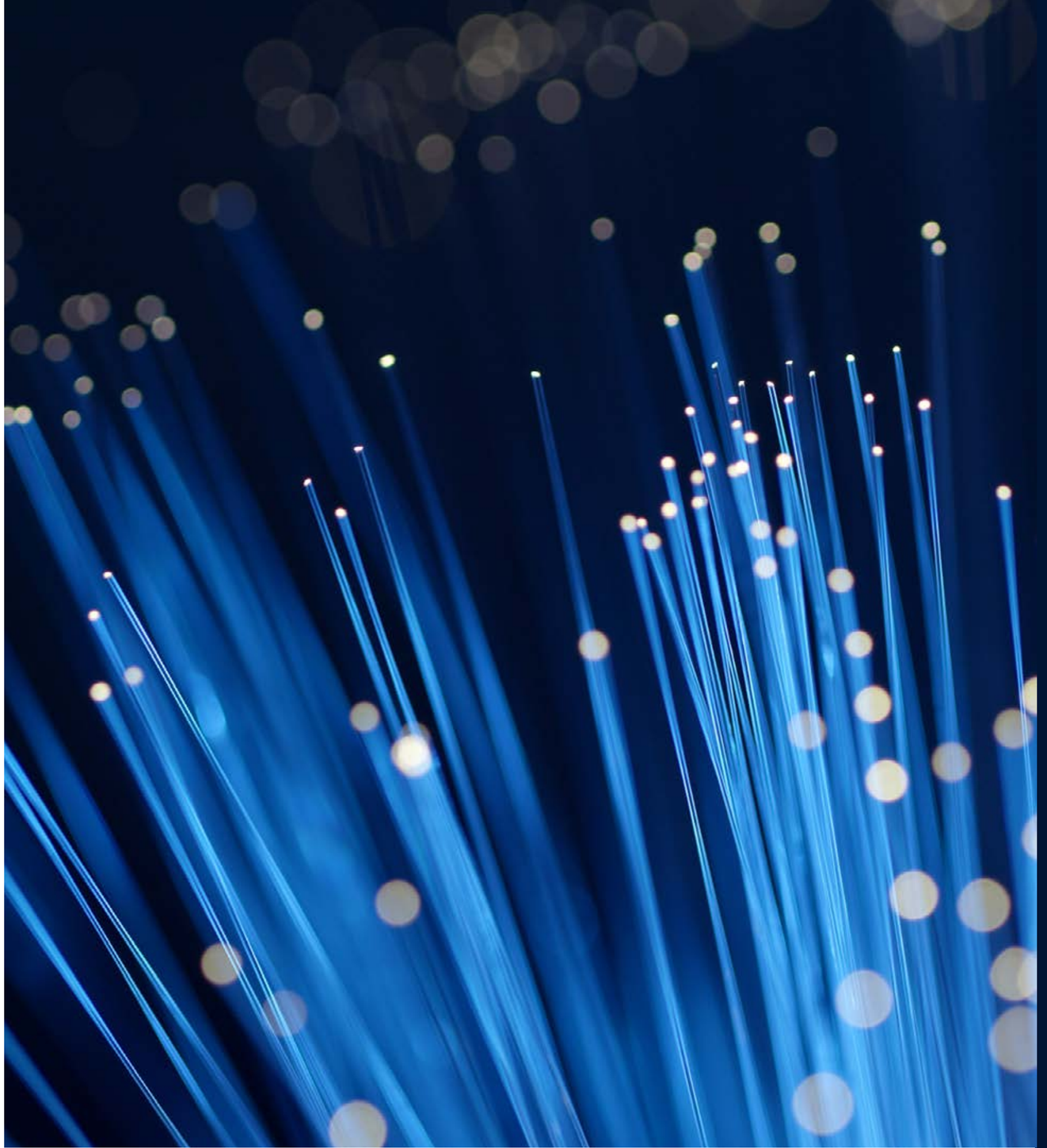
1,2,2,2,3, **4,** 4,5,5,6,100

50%

The 50th percentile is the value at which 50% of the numbers in the data set are below and 50% of the values are above. In this simple 11-item data set, we can jump to the sixth element and get 4, which is the 50th percentile, or median value. Similarly, the 80th percentile is the value at which 80% of the data set is below and 20% is above, and so on.

Fiber

We’re excited to introduce metrics from fiber network operators, subscribers, and equipment to the ISP Network Report. We’ve also included results comparing and contrasting fiber and fixed wireless network performance and trends for the first time here.



Fiber Metrics

As expected, fiber shines when it comes to subscriber latency, but latency still rises some under load on fiber networks. Surprisingly, subscriber monthly usage is very similar when plan speed is taken into account. Also, differences between fiber and wireless nearly vanish when comparing plans of the same speed!

You'll find detailed fiber metrics throughout this report.

Fiber is widely considered to be the gold standard for Internet distribution. However, it is expensive and time-consuming to install. Fixed Wireless Access (FWA), on the other hand, can be deployed rapidly and is popular in areas where fiber isn't a cost-effective option.

Fiber Highlights

Subscriber Throughput, page 17

Fiber & Fixed Wireless Latency Comparisons, page 20

Subscriber Usage, page 23

Busy Hour Online Load, page 25

Operator Metrics

A topic that regularly comes up across Preseem's customer base is, "How am I doing relative to my peers, and what are the key benchmarks and performance indicators on churn, customer support, and network operations? What should I measure myself against?"

Operational Survey

Preseem conducted an Operational Survey with regional ISPs to find commonality in these benchmarks and spot correlations in the data that ISPs can use to establish their own operational KPIs and understand how they compare to peers.

We'll break these key benchmarks and insights down further in the following sections, elaborated in detail on the next pages.

Net Promoter Score* (NPS) > 61

The majority of respondents who actively measure customer satisfaction metrics like Net Promoter Score are doing very well.

Support Call Resolution < 1 hour

52% of respondents resolve network-related customer support calls in less than 1 hour.

Churn < 3%

While this represents a great benchmark to shoot for, more than half of respondents reported their annual churn numbers were greater than 4%.

Network-related Support Tickets < 25%

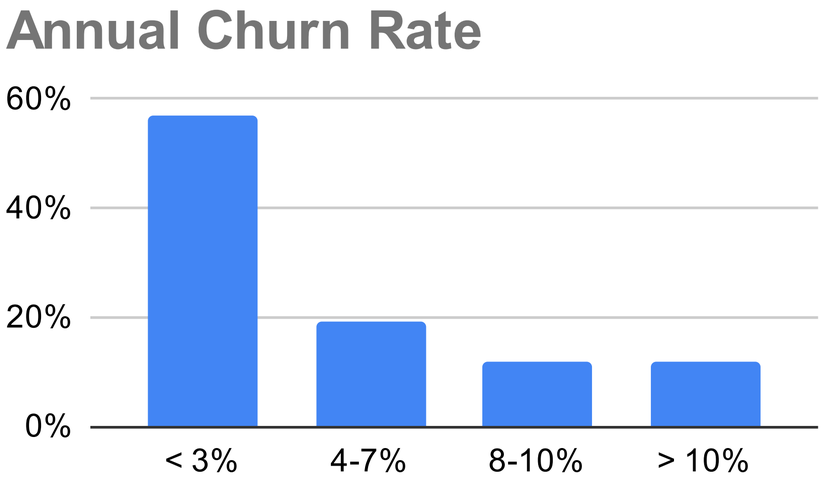
While more than 50% of respondents report that 25%–50% of support tickets are network-related, the target is < 25%

*According to Bain & Company, Net Promoter Score measures people's willingness to recommend your product or service to a friend or colleague. A good NPS score is 0 and above. Above 50 is excellent, and above 80 is world class.

Churn

Understanding and Benchmarking Subscriber Churn

All businesses experience customer churn at some point, and there are a variety of reasons why a subscriber may choose to move away from an ISP or their services. Here are some insights to consider when benchmarking churn against industry peers.



Churn Benchmark: < 3%.

The Good: 45% of all respondents report an annual churn rate of less than 3%.

Needs Improvement: Over 54% of respondents experience an annual churn rate greater than 4%.

Does churn adversely affect smaller ISPs?

Higher churn rates seem to affect ISPs with <1,000-5,000 subscribers more prominently than ISPs who have more than 5,000 subscribers. This likely speaks to the highly competitive markets that smaller ISPs operate in, and the greater access to resources that larger companies may have in place to better retain subscribers.

How do customer satisfaction and NPS scores affect churn rates?

Examining our survey responses, typically, the higher the NPS or customer satisfaction score, the lower the churn. For example, ISPs with an NPS of >61 overwhelmingly report churn rates of less than 3% (83%).

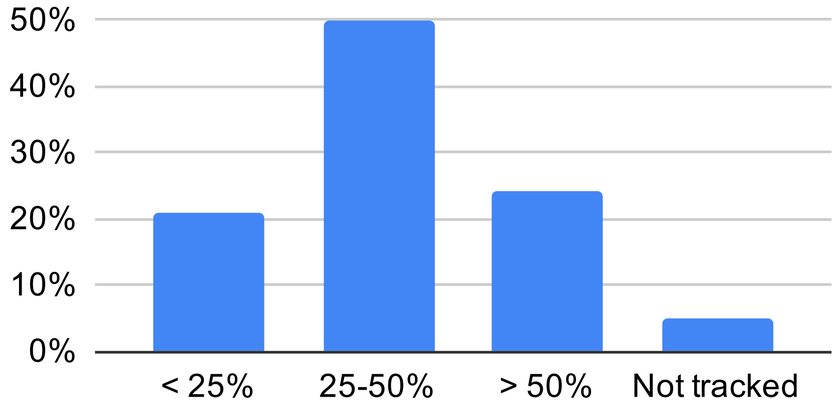
Is there a correlation between planned access technology investments and churn propensity?

Looking at the survey responses, there appears to be a correlation between ISPs that are planning vendor additions, and lower annual churn rates. For example, 42% of those considering or planning access technology expansion (across fixed wireless and fiber technologies), responded that they see churn rates below 3%.

Customer Support

Efficient customer support and speedy ticket resolutions are hallmarks of a successful ISP.

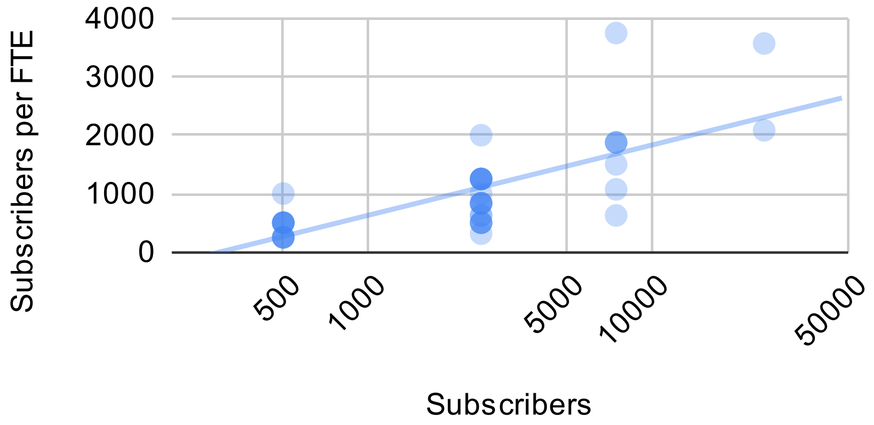
Network Performance Tickets



One general measure of support efficiency (when not outsourced) is in how many Full Time Employees (FTE) are dedicated to support. We've plotted this as a function of subscribers effectively handled per employee. There's a clear trend line that shows efficiency gains as ISP size increases.

Favorably, 52% of survey respondents said they can resolve network-related support calls in less than an hour. However, 13% require more than 4 hours to resolve the same issues. Using these benchmarks to drive efficiencies around reducing support times also directly correlates to reducing churn risk. For example, ISPs reporting >50% of support tickets related to network issues are more likely to have churn rates above 10%, while respondents with <25% network-related tickets tend to report churn rates below 3%. This indicates that network reliability is a key driver of customer retention.

Subscribers per Support FTE

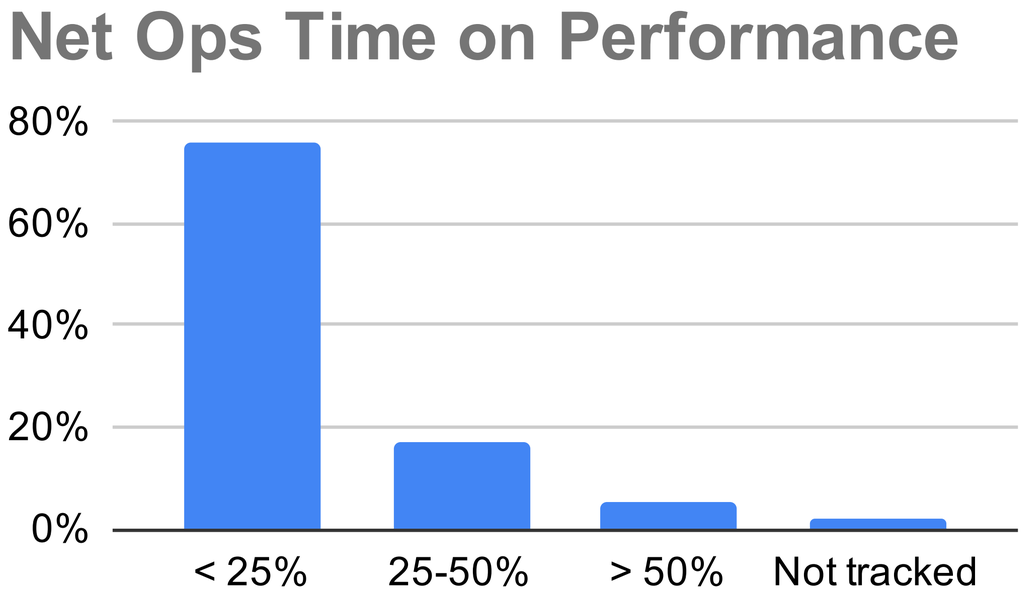


Network Operations

Network operations efficiency is a key indicator of an ISP's ability to deliver reliable service.

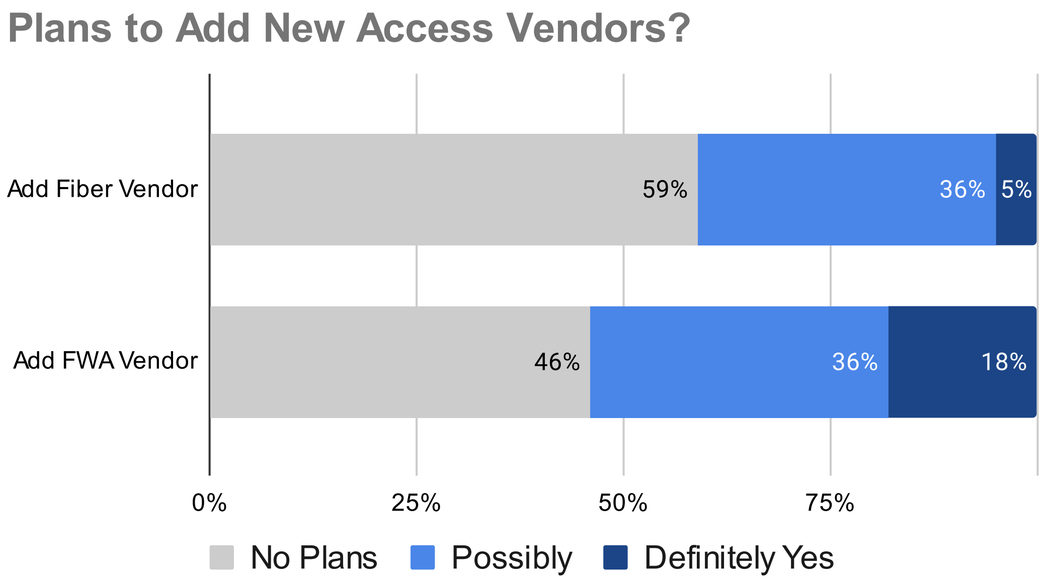
A significant portion of survey respondents (76%) reported that their network operations teams spend less than 25% of their time resolving network performance issues like slow speeds or high latency. However, 21% spend more than 25% of their time addressing network performance problems, revealing room for improvement.

Network performance also has a direct connection to customer satisfaction. For example, ISPs with high NPS scores (>61) report that <25% of customer support tickets are related to network performance issues. Additionally, ISPs with <25% network-related support tickets tend to report churn rates below 3%. This highlights that proactive network management greatly impacts customer satisfaction and retention.



Access Network Technologies

Adding new access network technology vendors often correlates with improved network reliability and better alignment with subscriber expectations.



Among survey respondents, 36% are planning or considering adding new access technology vendors—whether fiber or fixed wireless—within the next 12 months.

ISPs adding new access technology vendors tend to experience better operational efficiency and customer outcomes. For example, ISPs planning to add new vendors are more likely to spend <25% of their network operations time resolving performance issues. Additionally, these ISPs report lower percentages of network-related customer support tickets and are more likely to achieve churn rates below 3%.

Finally, ISPs without plans to expand fiber or fixed wireless access technologies report lower NPS scores (<25), reflecting a risk of reduced customer satisfaction and less loyalty introduced by not investing in new network technology.

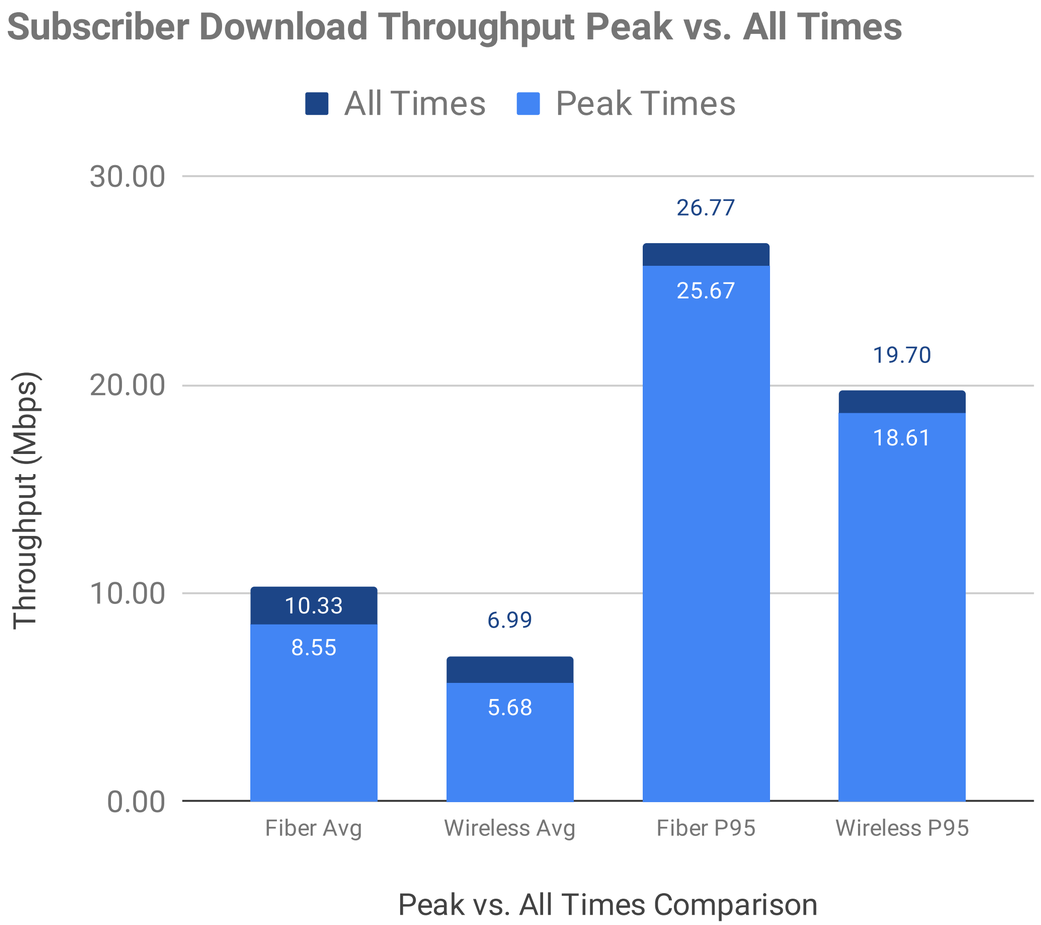
Subscriber Metrics

The metrics in this section present a high-level overview of the subscriber experience across all types of networks and equipment.

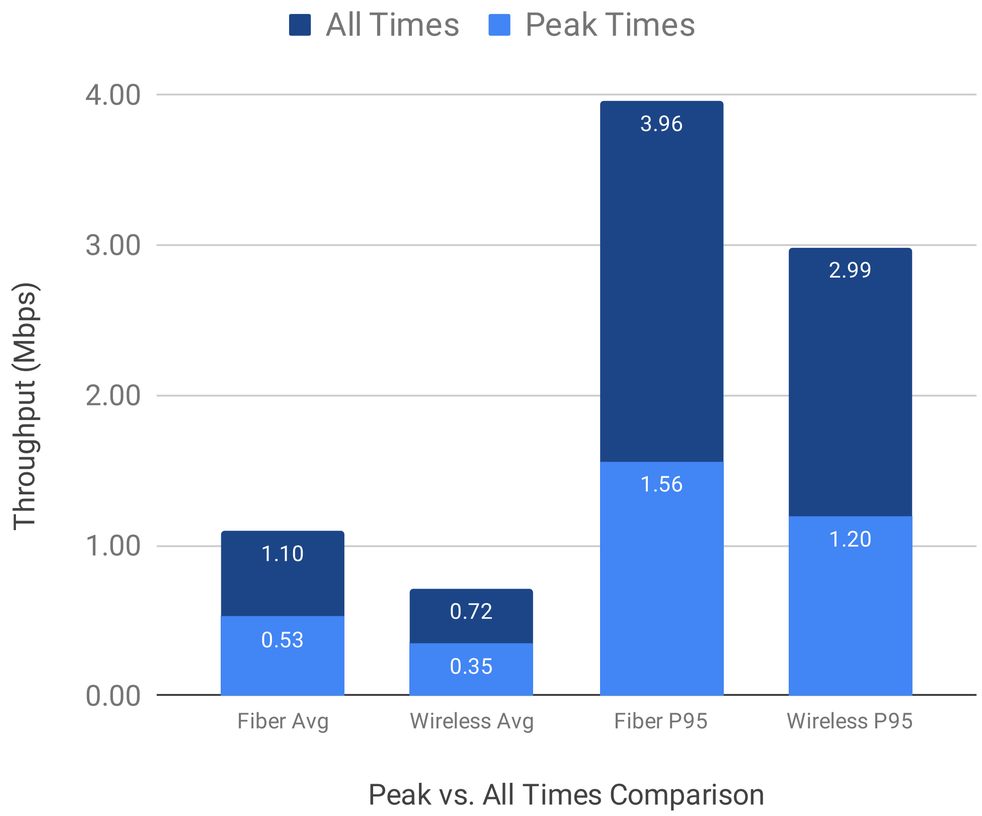
Throughput

This chart compares the download throughput achieved by ISP subscribers during the busiest (peak time) and other times of the day. The difference between peak and off-peak is surprisingly small. This indicates that, on the whole, subscriber throughput does not degrade significantly during busier times. Pat yourselves on the back, ISPs! Subscriber download throughput for all times has risen 8% from 2023, a slightly smaller rise than 2022–2023 (9%).

In this report, we distinguish between active subscribers (those actively using the Internet) from connected subscribers, which refers to the number of radios or subscriber modules attached to an access point, and ONTs connected to a PON.



Subscriber Upload Throughput Peak vs. All Times



Peak vs. All Times Comparison

The upload throughput numbers are less predictive because most subscribers don't stress the upload direction of their connection.

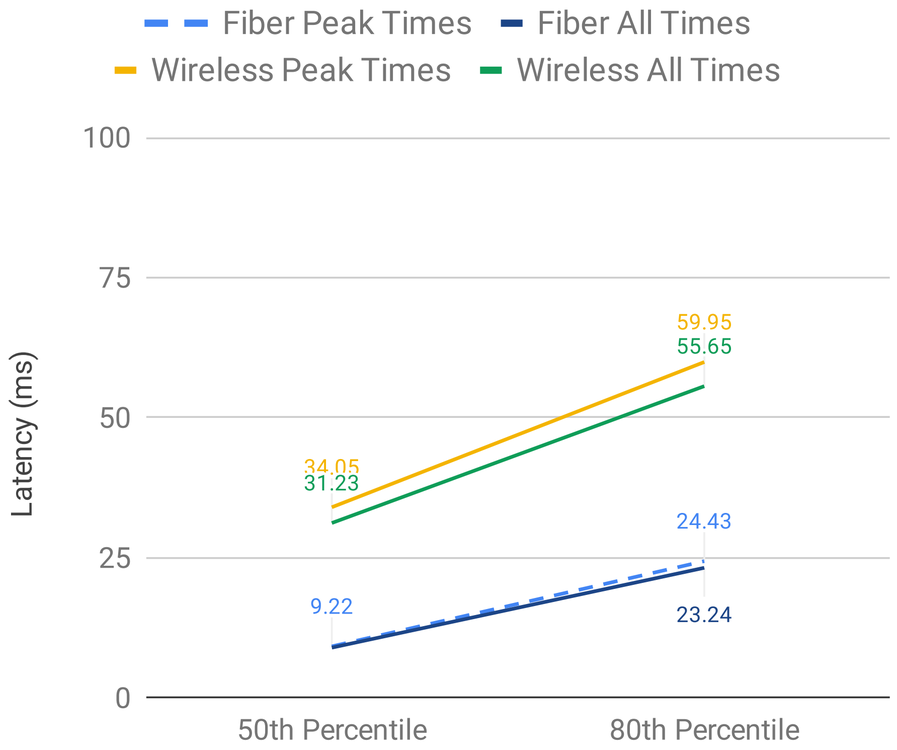
Compared to download speeds, upload speeds for individual users show a greater difference between peak and off-peak times. While download performance is typically the main concern for users, it is important to understand that a congested upload connection can disrupt downloads by delaying acknowledgment signals. Congested uploads can also lead to packet loss, which negatively impacts user QoE.

Fiber shows greater usage in the download than FWA due to the prevalence of higher speed plans. As a result, we can conclude that upload overall is less constrained than download, as the peak and off-peak variance is lower between fiber and FWA. Higher speed plans do not automatically generate more upload consumption.

Latency

Preseem measures latency by tracking the round trip time for individual TCP segments.

Subscriber Latency



TCP sampling gives us a detailed view of the latency in the access network, and results in thousands of latency samples per second per subscriber. This is fundamentally different from an ICMP ping-based latency measurement; TCP sampling measures true end-to-end latency, including the latency in the subscriber's home. Both FWA and fiber tend to terminate on in-home WiFi, with FWA showing the additional latency of one extra wireless hop.

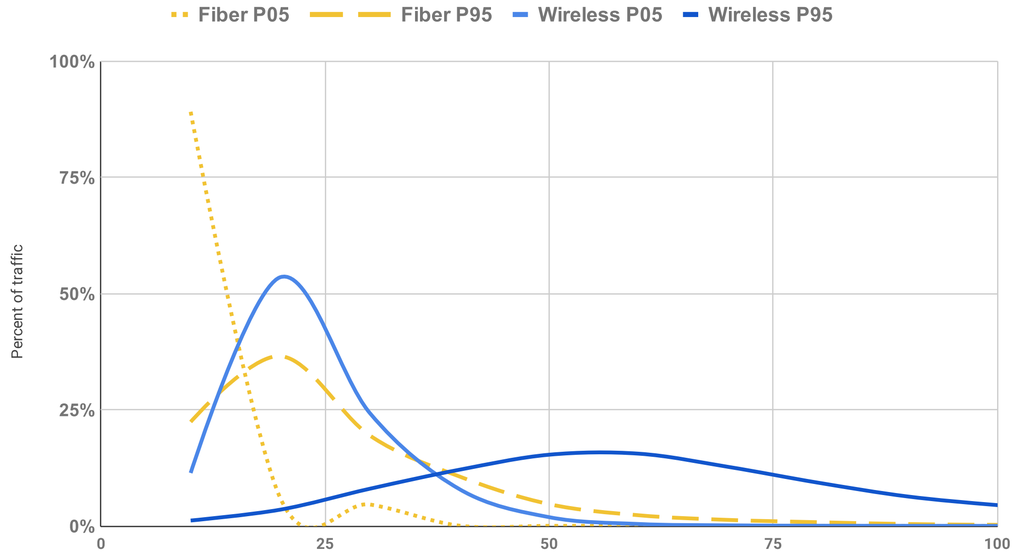
Somewhat surprisingly, the latency difference between peak and off-peak times is relatively small. Note that these metrics are collected from networks where Preseem is deployed to optimize latency and the subscriber experience. It's typical that the latency in networks without such optimization is significantly higher. Peak latency has continued to lower, dropping nearly 9% year over year!

Latency Histogram

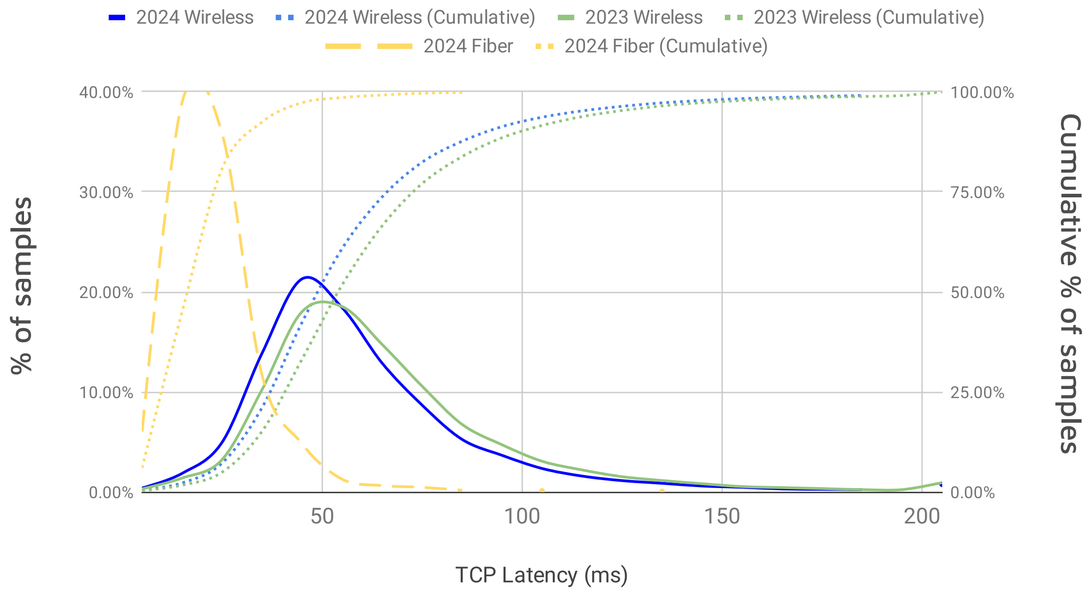
Histograms provide a way to see the distribution or likelihood of the samples in the underlying data. On the previous page we showed two percentiles of the underlying latency set. Viewing all the data produces a bigger picture view.

Fiber subscribers show mostly near-zero latency when idle which is consistent with the underlying technology. The P95 of fiber matches FWA very closely when idle — this is also consistent, because most of the added latency for a fiber subscriber under load is in the in-home wireless! So the primary difference between loaded FWA and fiber, in this data set, is that fiber exhibits the added latency of one wireless link, and FWA shows the latency of two — the in-home wireless latency added to the last-mile FWA link.

Idle and Busy Latency by Technology



Preseem Latency Histogram 2023–2024



SIDEBAR

Where Does Latency Come From?

Latency, or delay, is the time it takes for data to move through the network. There are many different sources of latency.

Propagation latency

Propagation latency is the time it takes for the electromagnetic or optical transmission to move from point A to point B. Unless you discover new physics, you can't do much about this (although high-speed traders do things like buy shorter fiber cables).

Frame Aggregation

In a sense, this is a type of queueing but because it's so prevalent in wireless networks it's worthwhile to discuss separately. To achieve higher throughput, many wireless technologies aggregate several Ethernet/IP frames into one radio frame. This optimizes for throughput at the expense of latency, as the access point waits some predefined amount of time to construct the aggregate before transmission.

Queueing Delay

Queueing delay is the largest source of latency in a network. When a device starts receiving a packet, it must hold onto that packet until it's been completely received and then begin transmission on the output port. For example, receiving or transmitting a 1500-byte Ethernet packet at 1 Mbps takes 12 ms—that's the best case. Typically, there's a buffer used to absorb bursts and enable prioritization. The size and techniques used to manage this buffer drastically affect the latency it introduces. Bad buffer management results in the dreaded Bufferbloat problem. Preseem reduces queueing delay through active queue management (AQM) techniques that greatly improve subscriber QoE, even when the network or the subscriber's connection has reached its capacity.

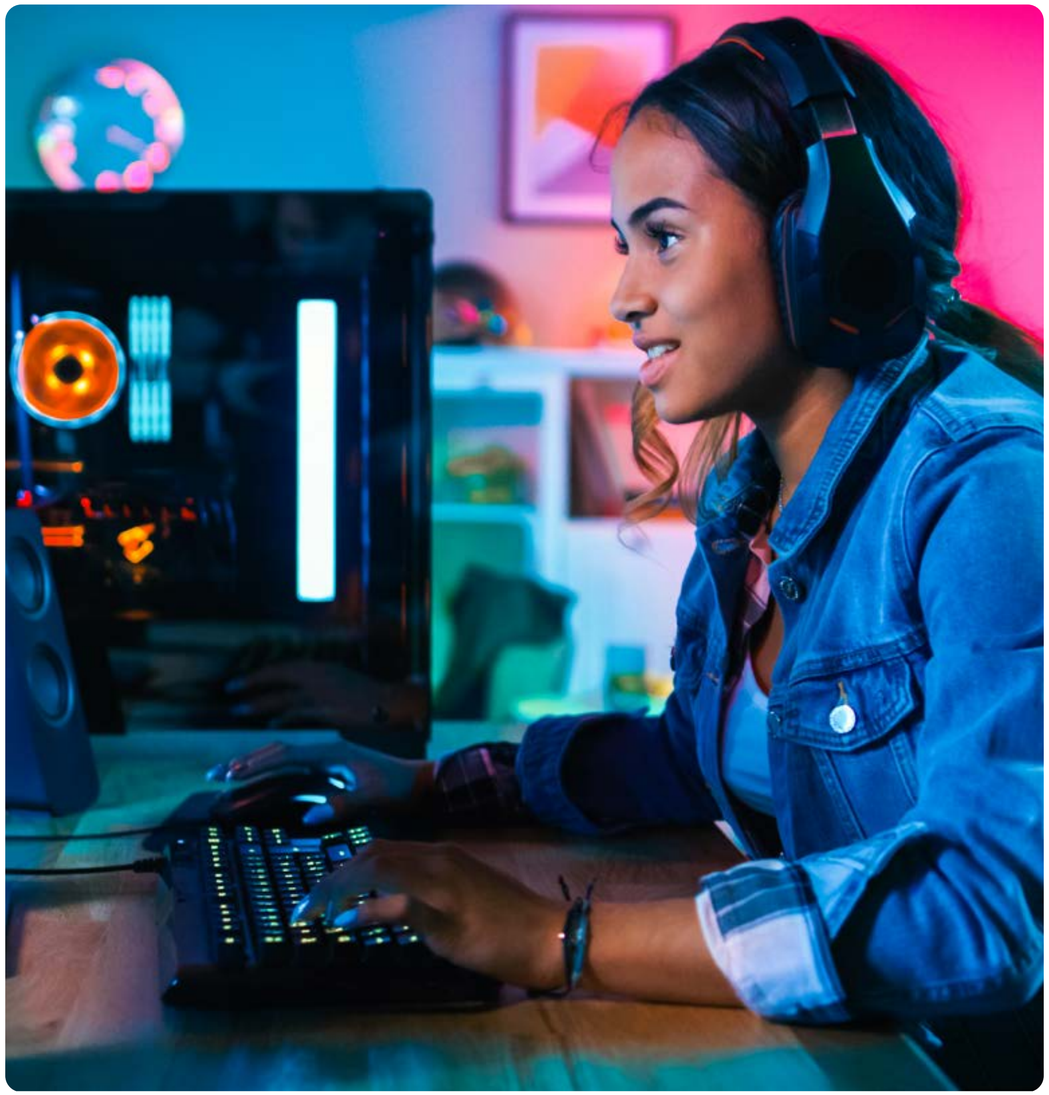
SIDEBAR

What is a Good Latency Value?

Latency requirements differ greatly by application. High latency has very little effect on Netflix, for example, but has a large impact on gaming. Gamers tend to refer to latency as “ping” times — high latency and high jitter (variability in latency) put gamers at a tactical disadvantage. Lower is always better!

Interactive video and voice calls also depend on having consistent and moderate latency. Typically, the end-to-end latency for a voice call needs to be less than 150 ms for the user to have a good experience.

Note that the values shown in this report represent the latency from Preseem to the subscriber and back, and as a result do not include the rest of the path. Therefore, the values here need to be lower than 150 ms to achieve a good VoIP experience. Latency has improved steadily over time, largely driven by last-mile improvements.



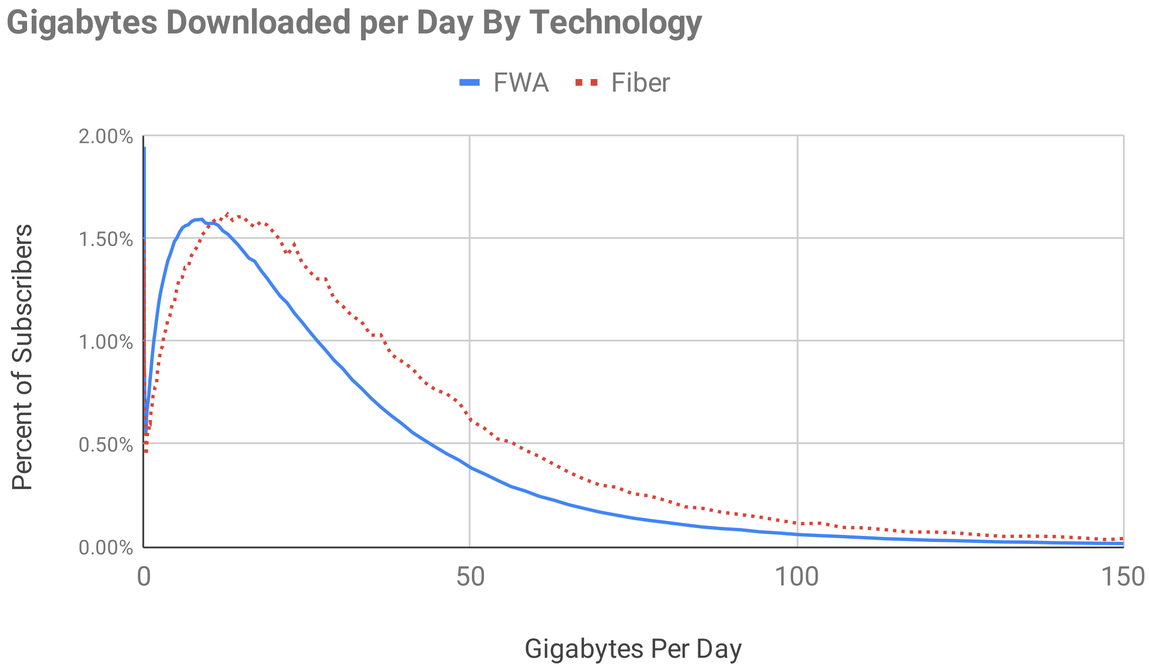
Subscriber Usage

The total number of bytes transferred by a subscriber over a period of time.

From the perspective of the subscriber experience, the total usage isn't very instructive. Usage that occurs during off-peak time has less of an impact on perceived network quality than even a relatively smaller amount of usage during peak hours.

The average download usage for fixed wireless subscribers is 12.7 GB per day (1Y 8% increase). As expected, the average hides the significant variation that occurs between subscribers, but is most representative of overall growth. The balance is trending toward heavier users.

Fiber users consume more than FWA, but this is largely due to having larger speed plans— as we show on the next page, small plans are constrained by the plan itself. Technology is not the true differentiator.



Usage Year-over-Year Comparison

	Median (GB)			Average (GB)		
Technology	**2023**	**2024**	**Change**	**2023**	**2024**	**Change**
FWA	5.51	6.18	+12.16%	11.79	12.71	+7.80%
Fiber	*	10.05	*	*	18.03	*

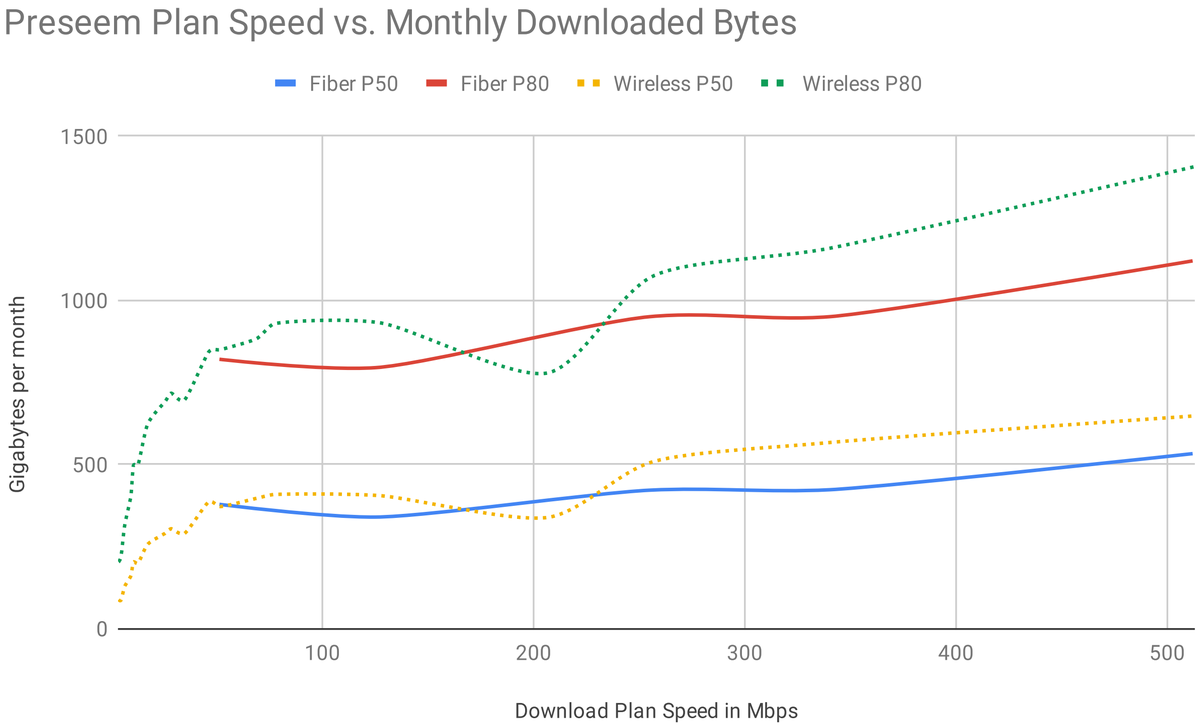
*2024 is the first year reported for Fiber Usage

Subscriber Usage by Speed Plan

Attempting to characterize an “average” user doesn’t present the whole picture of user behavior. By breaking down subscriber usage by speed plan, we can see the relationship between plan and total data consumed. In all cases, there’s a large gap between the median user and users in higher percentiles.

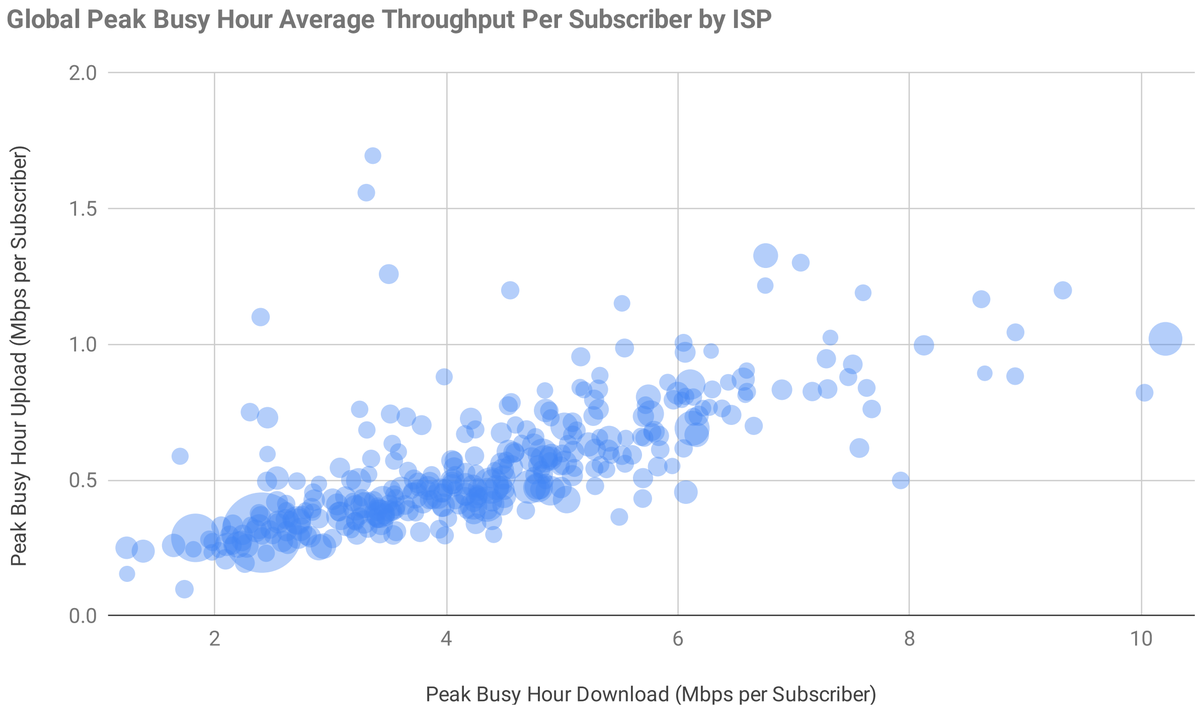
In fact, the median user (typical of “most” users) does not use much more data as the speed plan increases, particularly above about 50 Mbps. This likely suggests that gigabit plans are not required for the vast majority of subscribers. Fiber plans largely are not sold below 50 Mbps, so the increase in usage is very similar to wireless at higher speeds. Relatively few wireless plans are sold at speeds greater than 500 Mbps, so we have limited the chart at that speed for comparison’s sake.

From a consumption perspective, raising plan speeds doesn’t proportionately break the bank in terms of resources consumed, and the access technology makes very little difference to subscriber usage habits.



Download to Upload: Peak Busy Hour Ratio

We do not see increased demand for symmetric services, but an overall trend at 8:1, with 5:1 in the mid-term future.



Here we analyze subscriber usage habits. On the last page we saw that users are constrained at low plan speeds, but overall download to upload usage is remarkably consistent around the globe. 10 download megabits per 1 upload megabit is no longer sufficient upload bandwidth, at least in smaller plans. Symmetric plans will help reduce latency under load but are not currently fully utilized, given the high prevalence of streaming video consumption rather than upload.

Busy Hour Online Load (BHOL) is a simple metric defined as the peak ISP usage divided by the number of subscribers (both inactive and active at that moment). These trends are useful for planning oversubscription at the core and backhaul level, but are not as useful for planning capacity for “meeting the speed test”. Speed test reliability is typically a function of the most congested point on the network, usually the access point.

Most ISPs deliver between 3 and 4 megabits per second in the downstream direction, averaged per subscriber, across all technologies including fiber.

Fixed Wireless Metrics

Preseem collects and utilizes many access point metrics when measuring and optimizing subscriber QoE. This section presents an analysis of Preseem metrics grouped by access point model and vendor information.

You might say, “This doesn’t look anything like the access point spec sheets! These numbers look too low!”

Remember that these are real-world throughput numbers observed by Preseem, not the highest attainable figures. For example, if a model T access point is capable of 100 Mbps, but every model T Preseem sees only has one subscriber, then the reported rates for model T access points will be low. However, this extreme scenario is unlikely for any but the most rare of AP models.

AP Market Share

In order to understand the access point market share, we look at two metrics:

The percentage of the fixed wireless market by the number of APs

The percentage of the market by subscriber count

Ubiquiti shows the biggest growth year over year in access points installed, but not much growth in CPEs. This indicates growth in deployments with fewer links per AP.

Tarana's CPE count has more than tripled in Preseem's dataset in the 2023–2024 samples.

Some vendors like Airspan are present and experiencing growth in the market but are not yet supported by Preseem.

Year over Year Comparison of CPE and AP FWA Vendors

	CPE			AP		
Vendor	**2023**	**2024**	**Change**	**2023**	**2024**	**Change**
Ubiquiti	49.06%	50.56%	1.50%	56.20%	60.82%	4.62%
Cambium	40.45%	35.37%	-5.08%	29.56%	26.54%	-3.02%
Mikrotik	3.62%	4.45%	0.83%	8.79%	6.74%	-2.05%
Tarana	1.97%	6.22%	4.25%	2.05%	2.93%	0.88%
Mimosa	1.42%	1.35%	-0.07%	1.60%	1.20%	-0.40%
Other Vendors	0.80%	2.05%	*	0.80%	1.77%	*

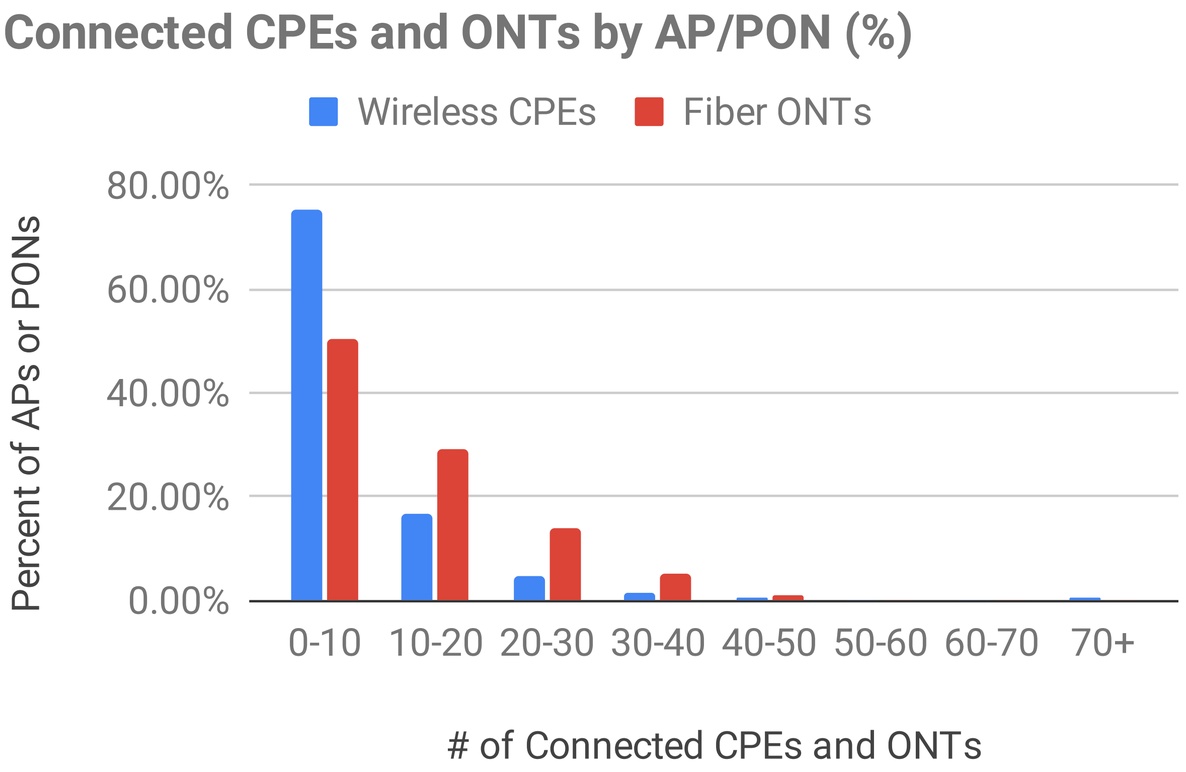
*Representing change year over year for Other Vendors would be misleading, as several vendors have dropped below our 1% market threshold for breakout.

Connected Subscriber Count

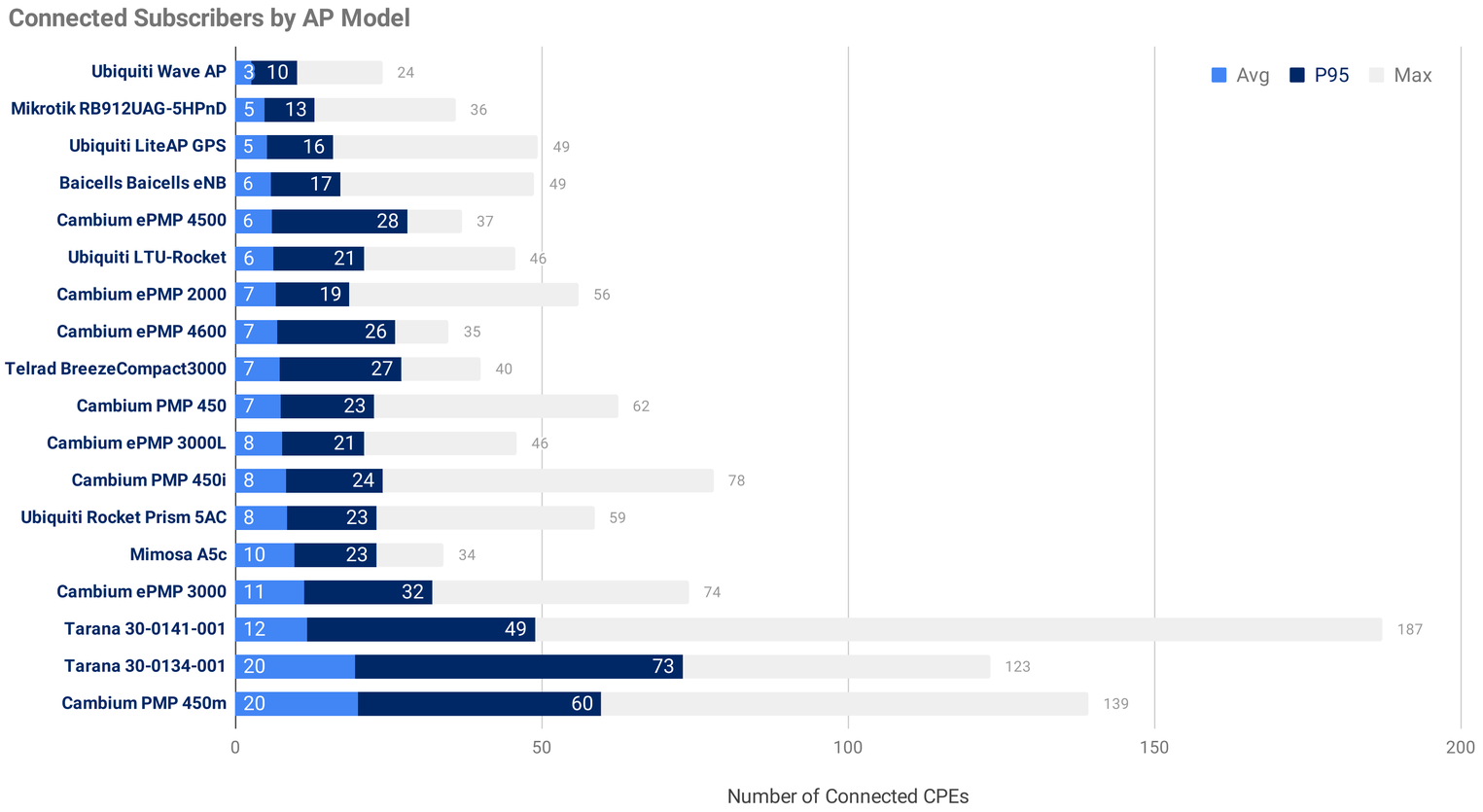
There is significant variation in how many subscribers are connected to a given Access Point (AP) or fiber Passive Optical Network Port (PON).

High-density wireless deployments have increased by 50% (.27% to .41% of FWA deployments).

Over 75% of FWA access points have <10 subscribers attached, unchanged from 2023, while medium-density sites are growing larger.



Connected Subscribers



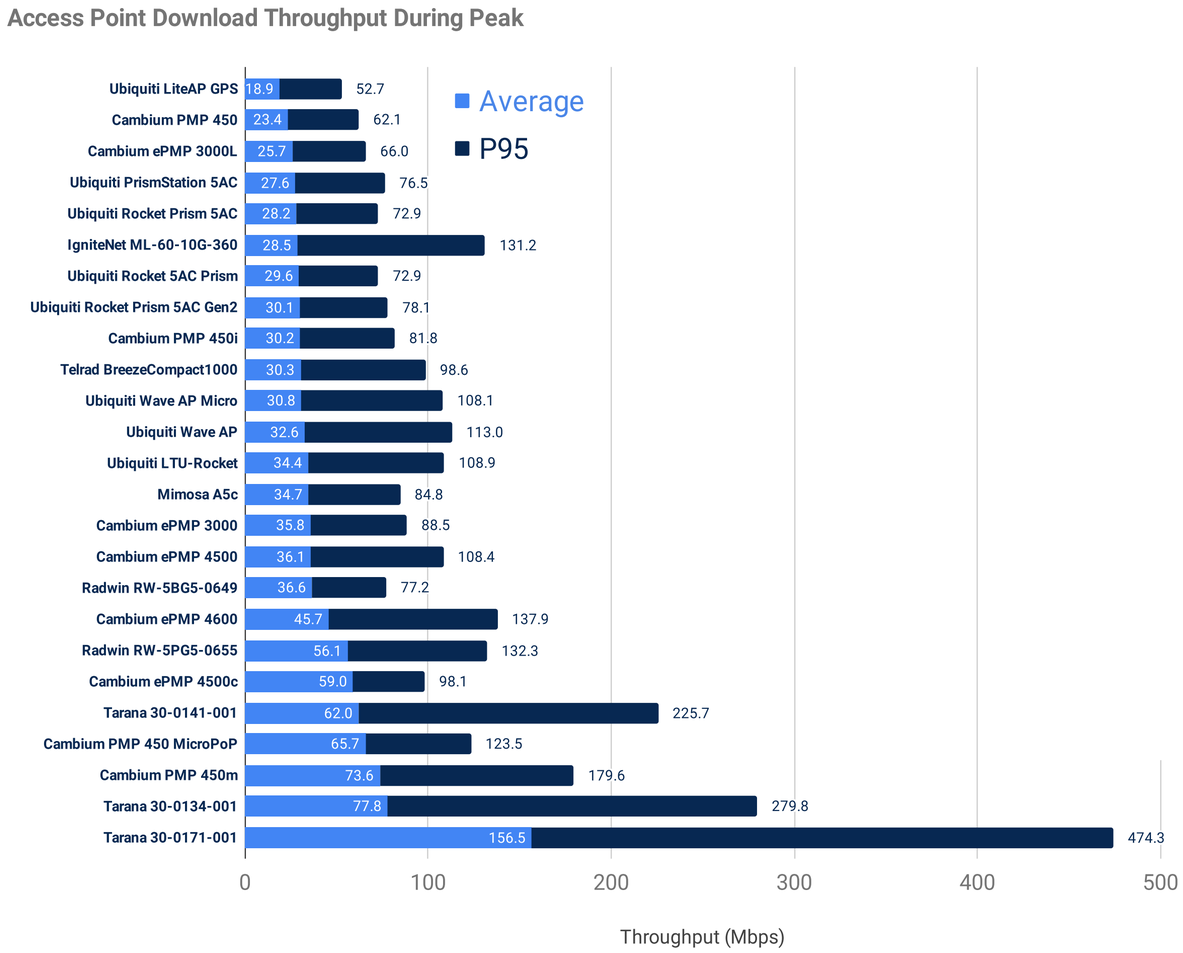
Since measuring throughput outside of peak times provides little insight into the subscriber experience—because the network isn't loaded—the throughput numbers that follow were taken from the busiest times of the day for each individual access point.

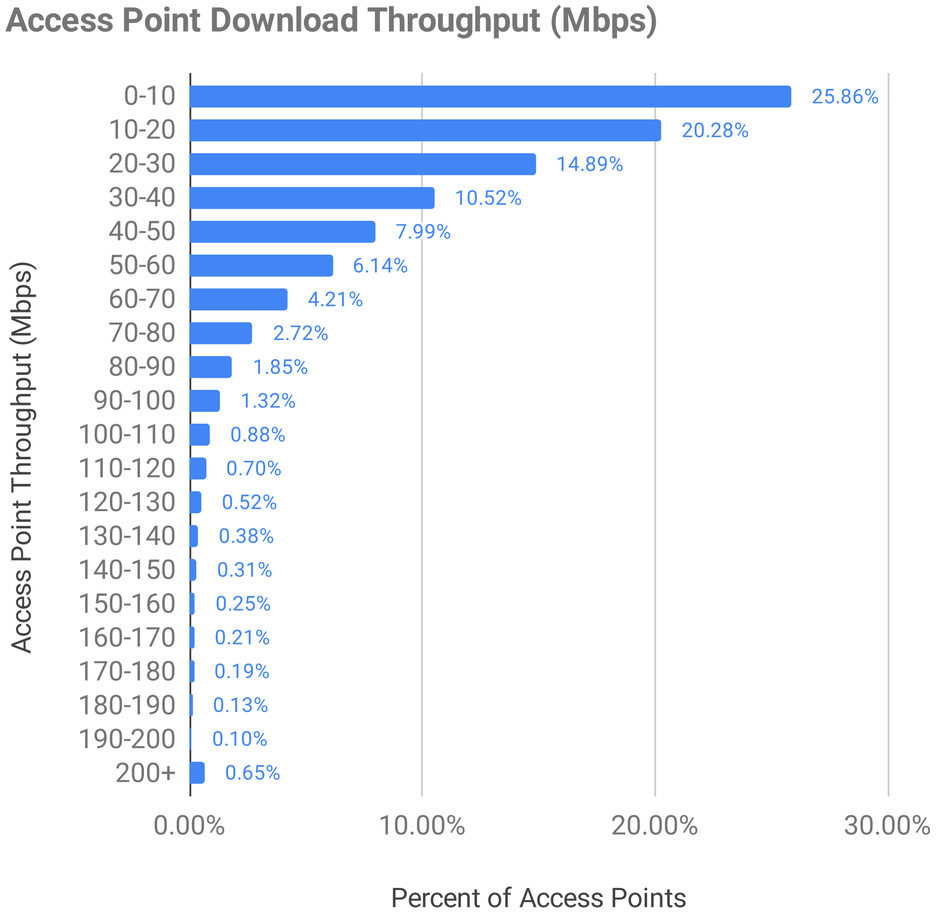
In some cases, deploying with many subscribers has a negative impact on QoE. Compare this with model latency on page 32.

Here we see that some AP models are typically deployed with many more subscribers than the overall average.

Download Throughput

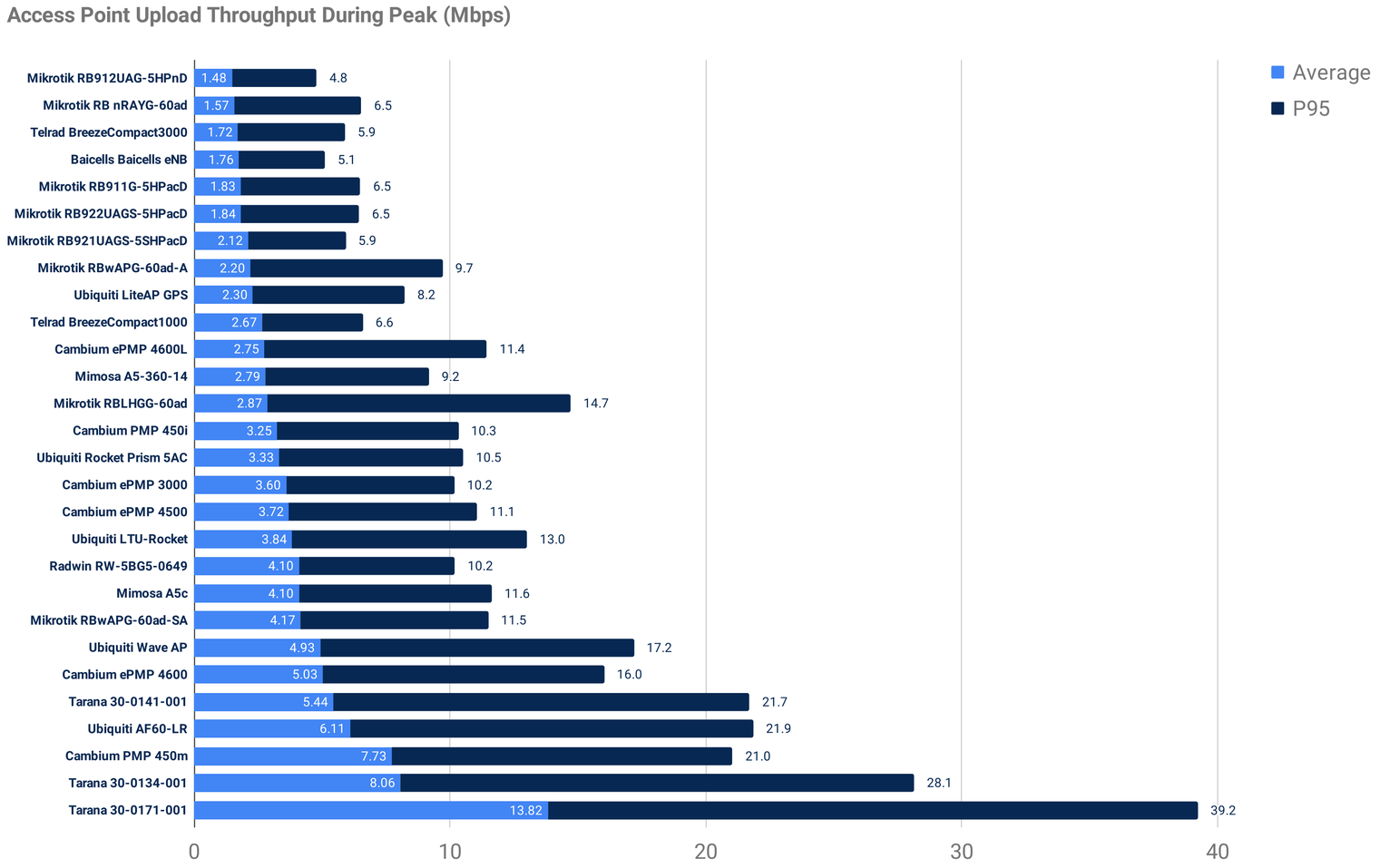
The data shows that, in terms of the number of access points, 26% (1Y 1%↓) of deployed APs deliver less than 10 Mbps of real-world throughput. Peak throughput broken down by model shows a full range of speeds.





Upload Throughput

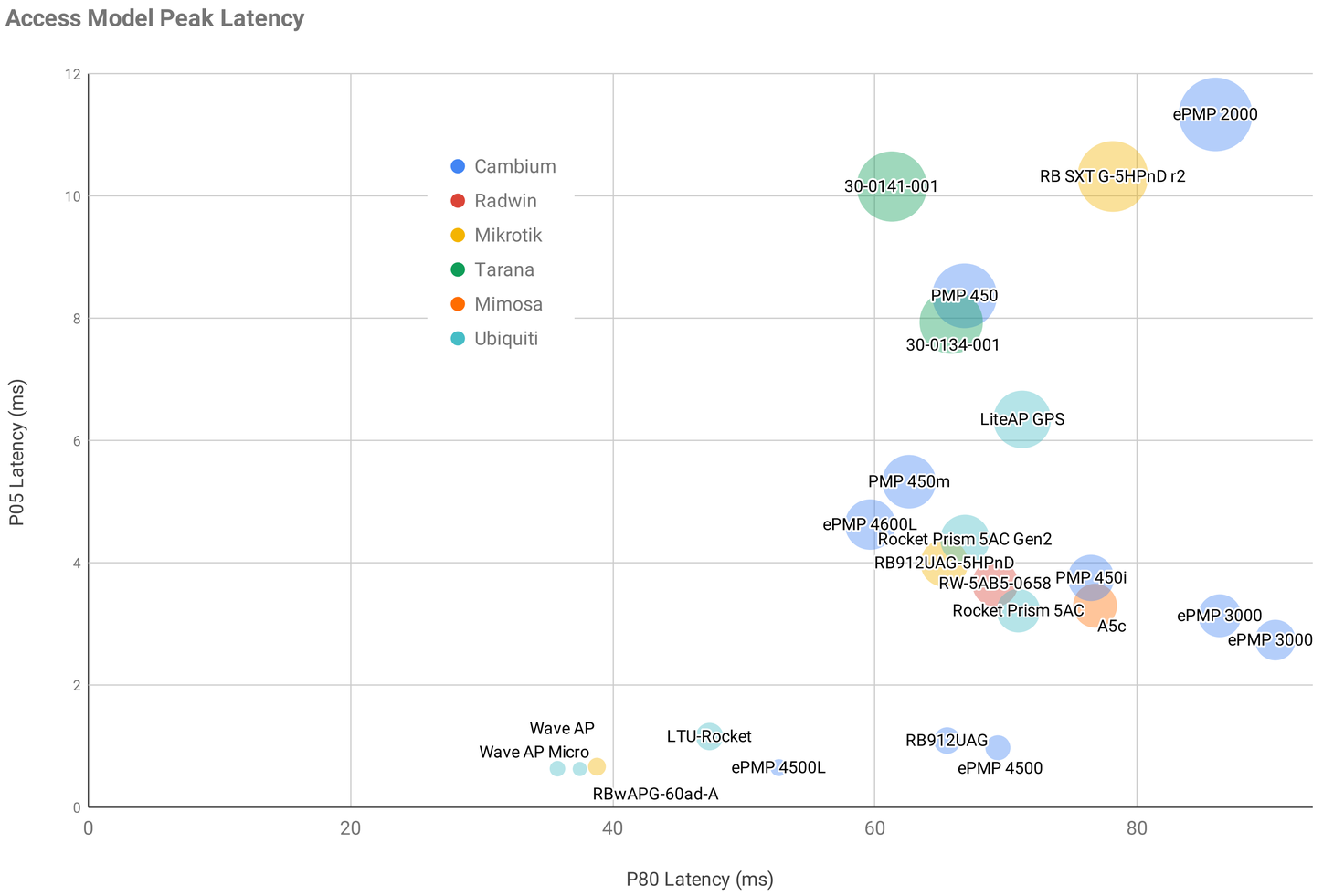
Characterizing upload performance is more difficult because demand is often lower than what the network is capable of (see page 18). However, there are still some interesting insights to be gained. In particular, almost all APs deliver less than 10 Mbps of upload throughput during the times of the day with the highest demand.



Access Point Latency

Across all access points, the distribution of latency follows an interesting pattern. Most APs deliver service with less than 100 ms of latency during peak times, but some older technologies like 4G LTE are over that benchmark. Latencies have improved since our last report, indicating that operators are upgrading their networks appropriately to keep up with rising demand.

Subscriber QoE is strongly affected by latency. The 5th percentile of latency is a good measure of the best case scenario, during idle time, while the 80th percentile shows latency under load.



Access Point Subscriber Capacity

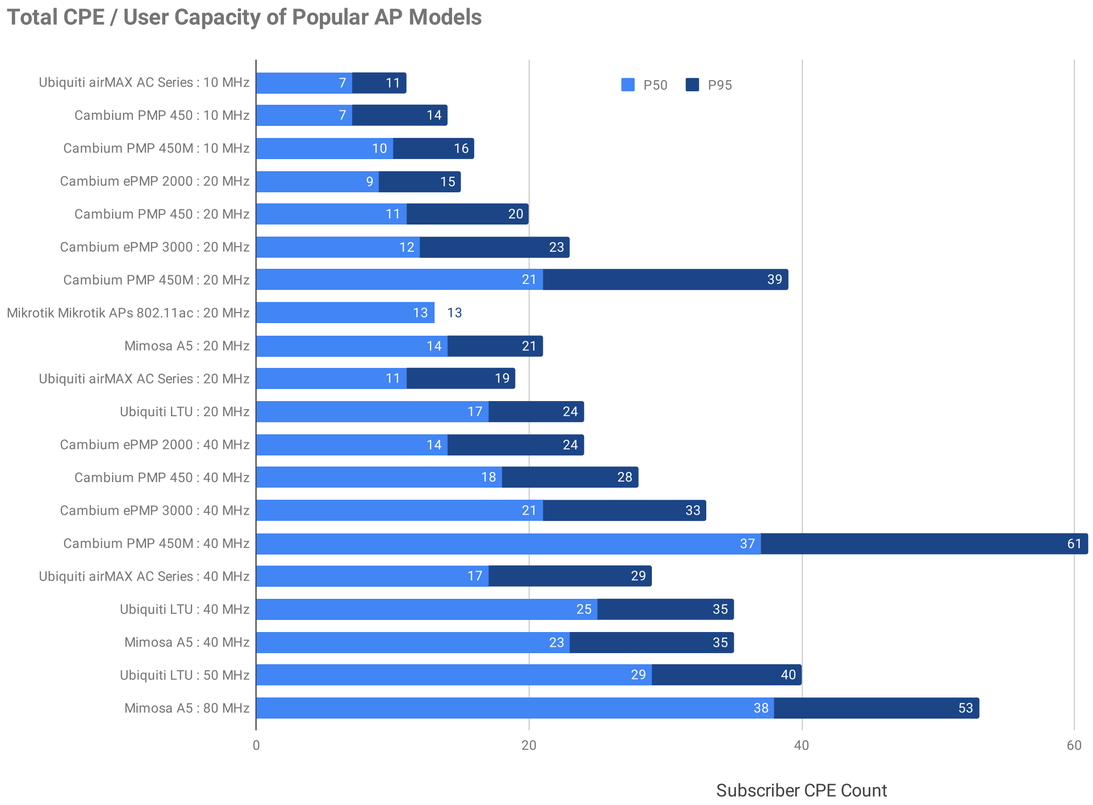
Airtime, bandwidth, and latency are all important metrics to understand, but what really matters is the number of subscribers that an AP can handle while still delivering a good experience.

Access point capacity, represented in terms of subscribers, can be used to drive marketing decisions and provides a common reference point between sales and network engineering teams.

Determining the capacity of an access point (by hand) in terms of subscribers is complex, requires deep knowledge, and often comes down to intuition built up through experience.

Preseem solves this problem by building a global performance model for each access point and configuration, and combining it with a model of subscriber behavior unique to each service provider. This answers the question of AP capacity in the simplest form possible—the available capacity in terms of subscribers.

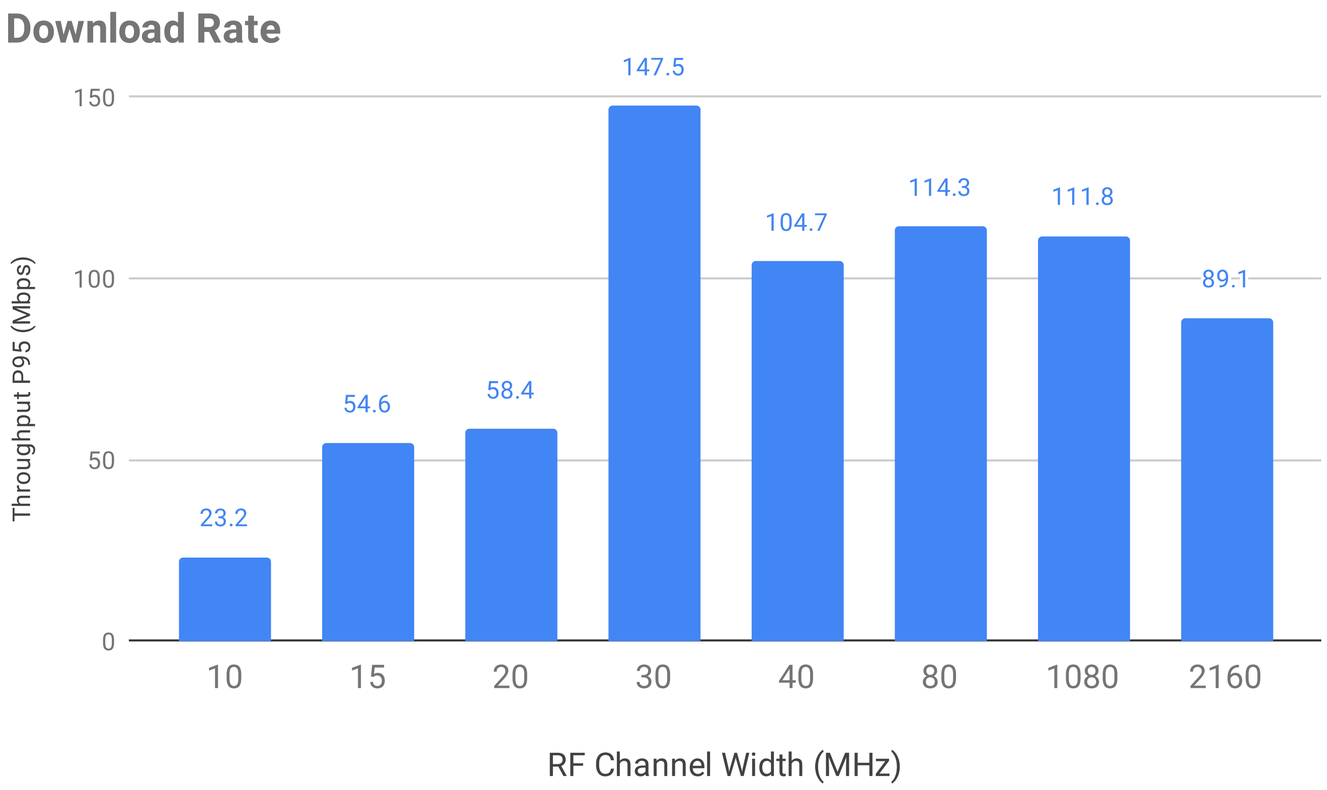
This chart summarizes the subscriber capacity across all Preseem customers for some common access point models and channel widths. Many models operate best at 50-60% of the achievable (P95) efficiency. In the case of radios like the PMP 450M, adding more users actually increases the efficiency (up to a point) due to more opportunities for MIMO transmission.



Download Rate by Channel Width

Besides obvious items like the location and AP model, the choice of channel width is one of the more important ongoing decisions that needs to be made for each AP, at every site.

By looking at all APs aggregated by channel width we can see that while a larger channel width increases throughput, the effect is not always equal to the increase in the channel size. Larger channel sizes are growing in popularity but are not as fully utilized, and will show more potential as airtime consumption increases.



Executive Summary

Preseem's annual ISP Network Report uses our extensive data set and operator surveys to provide a unique view into access networks across providers and different kinds of equipment, covering both fiber and fixed wireless.

Key insights from this year's edition include:

7 Mbps When Active

The average fixed wireless subscriber uses around 7 Mbps when active (1Y 7.5%↑)

Speed Plans

Speed plans over 100 Mbps often sit idle

Data Usage

The average fixed wireless subscriber uses 12.7 GB of data per day (1Y 8%↑), with the median user up 12%

Fiber NEW

For the same speed plan, fiber and wireless users have a remarkably similar experience

Consumer Habits

Many users don't consume much more data as their speed plan increases

Improved Latency

Latency has improved year over year, indicating that operators are keeping up with consumer demand

Glossary

Acronyms

AQM: Active Queue Management, a mitigation for bufferbloat

BHOL: Busy Hour Online Load — the total ISP daily peak instantaneous data rate divided by the number of subscribers, both active and inactive

CPE: Customer Premises Equipment, network-related equipment owned or leased by an Internet subscriber and located within their home

FWA: Fixed Wireless Access provides Internet where the receiving device (CPE) is fixed (not mobile), using wireless, e.g. not fiber or cable

ICMP: Internet Control Message Protocol, a way for network devices to exchange messages and communicate problems with data transmission

ISP: Internet Service Provider

MIMO: Multiple-In, Multiple-Out, an RF technology that allows transmitting to multiple receivers at the same time using the same frequencies

ONT: Optical Network Terminal, common name for a fiber CPE

PON: Passive Optical Network, typically refers to the ISP side of a fiber connection

P95: Shorthand for Percentile 95, the value exceeded by only 5% of the underlying sample set; P80, exceeded by 20%, etc.

QoE: Quality of Experience, typically measured per subscriber

RF: Radio Frequency, a term for wireless communications

TCP: Transmission Control Protocol, an Internet communications standard that enables reliable transfer of data

Terms

AP or Access Point: A hardware device that allows Wi-Fi devices to connect in the home, or CPEs to connect to an FWA network

Bufferbloat: Experiencing slow Internet due to bandwidth-intensive traffic on a network; ultimately caused by ISP equipment configuration

Fiber: A general term for Internet transport over optical fiber

Latency: The time it takes for data to be transferred from its original source to its destination, measured in milliseconds, sometimes round-trip

Subscriber: An individual or household that has an active Internet plan

Throughput: The achieved rate of data moving through a network

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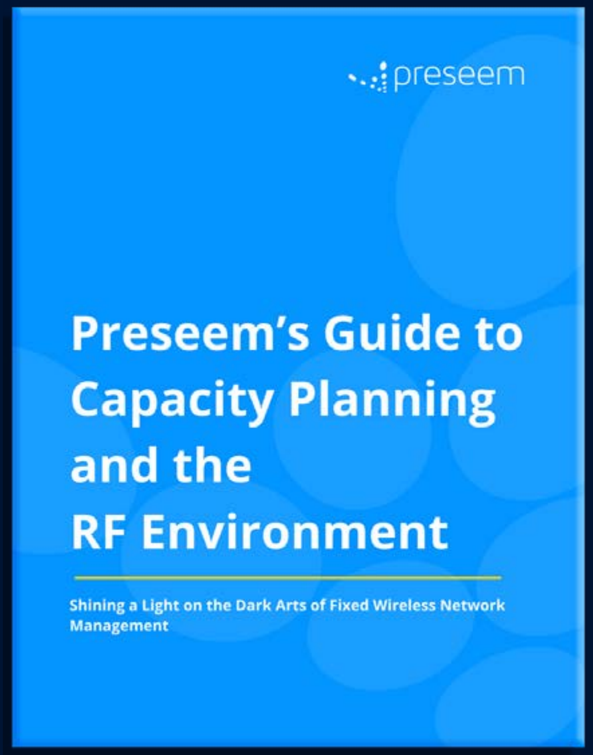
Visit preseem.com/links for more info.

ANOTHER GREAT READ



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