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2021 Fall Technical Forum
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Wireless Access Network

Optimizing Value from Service Provider Wi-Fi in a Converged World

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Shaw Communications

2021 Fall Technical Forum
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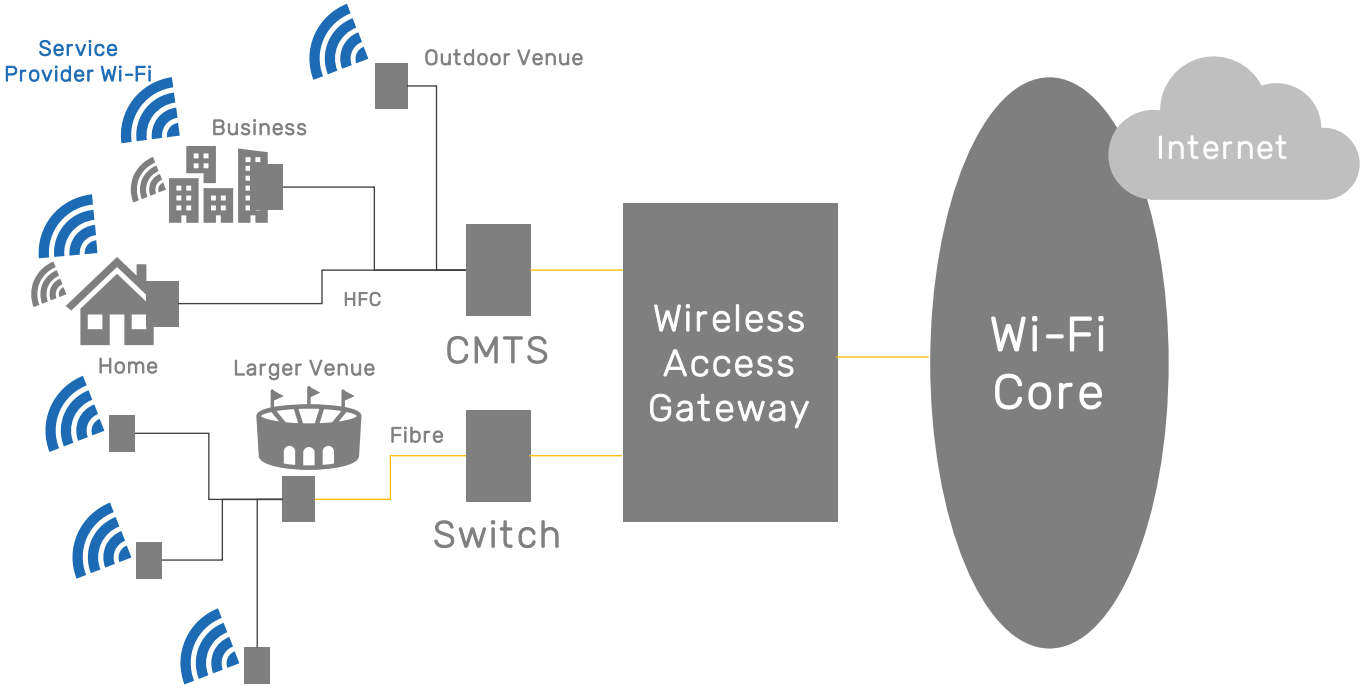
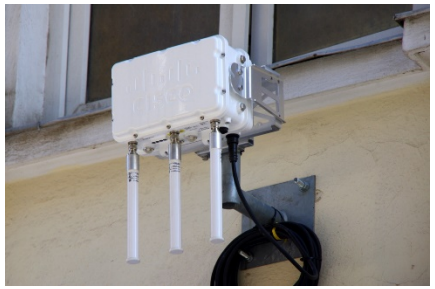
Service Provider Wi-Fi | Network





Over 900k Access Points

Consisting of indoor and outdoor service provider APs as well as secondary SSIDs from business and consumer Wi-Fi APs

Wide Availability

Available, free of charge to broadband subscribers, wireless subscribers and to the public for the duration of the COVID-19 pandemic

Unlimited Data

Wi-Fi data is not limited, speed caps are 30/5Mbps for broadband subscribers and 100/10Mbps for wireless subscribers

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Strategic Purpose

Customer Value

At your Destination

At Home On the Go

Subscribers want access to their broadband applications at home, on the go and at their destinations

- Wireline at home
- Wireless on the go
- Service provider Wi-Fi at your destination

What is the user experience?

Anecdotal accounts pointed towards some subscribers connecting to the network and not being able to connect to their applications

Is the network used as intended?

The network was meant to extend subscriber's services, but were they replacing them? Was the network being accessed in unintended ways?

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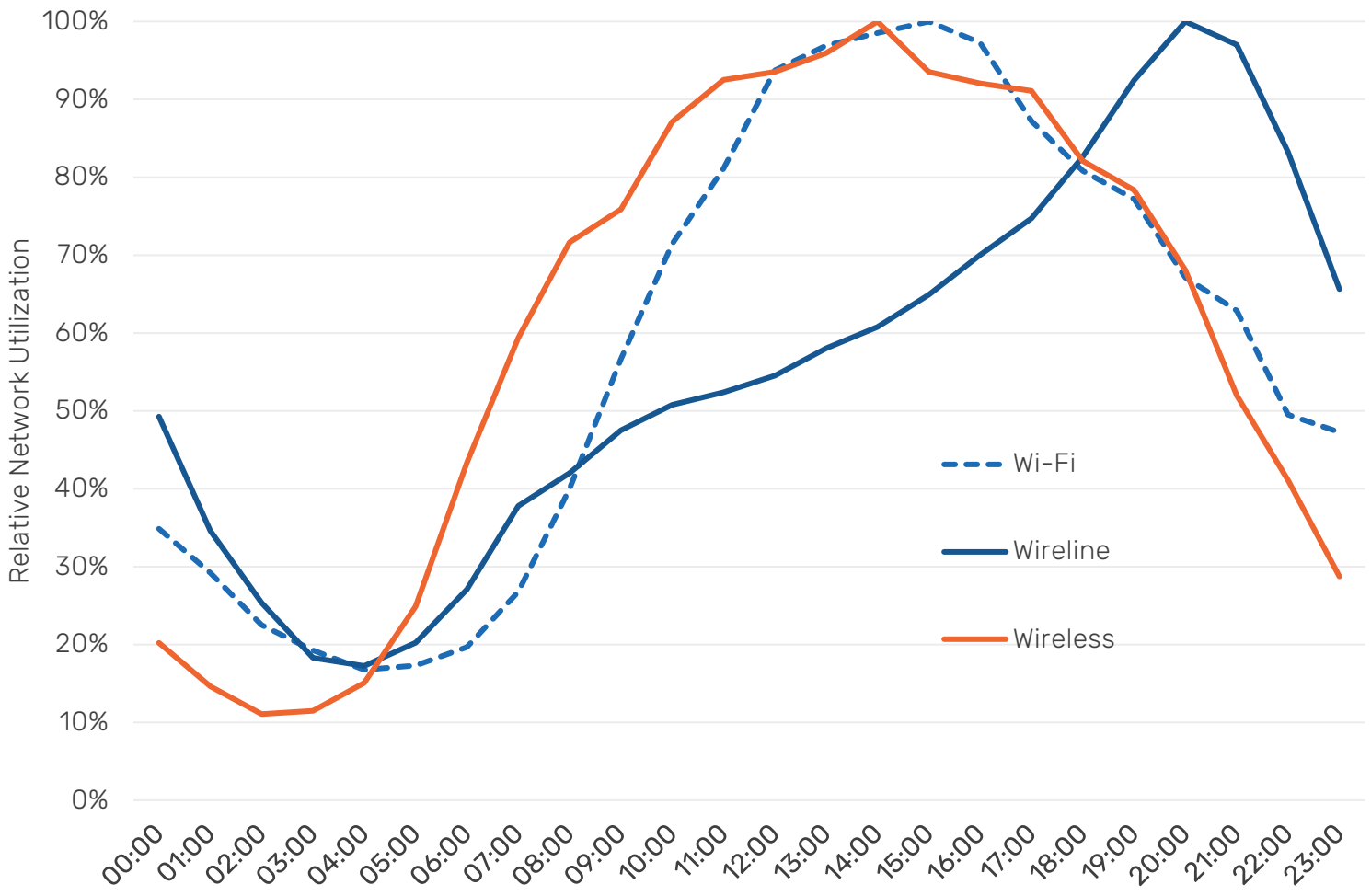
Service Provider Wi-Fi | Time of Day



Wireline network **peaks** in the **late evening** when subscribers are at **home**

Wireless network **peaks** in the **late afternoon** when subscribers are **on the go**

Wi-Fi behaves **like** the **wireless** network with a **delayed start** to the day

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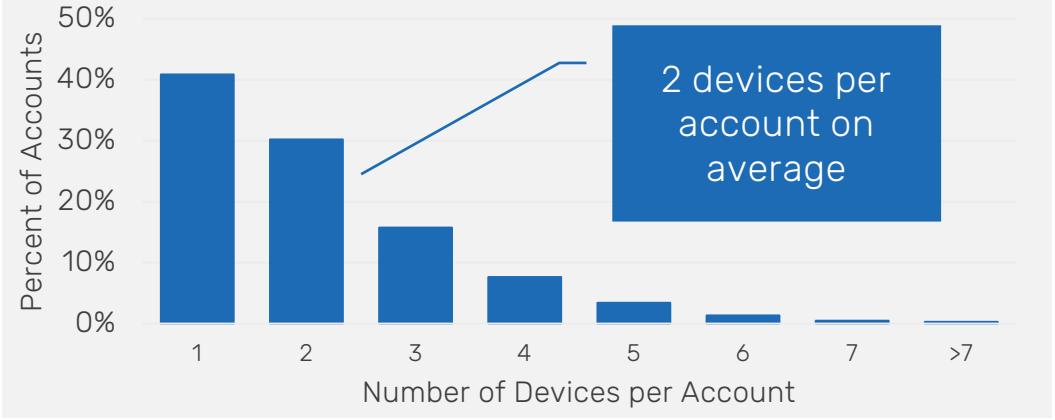
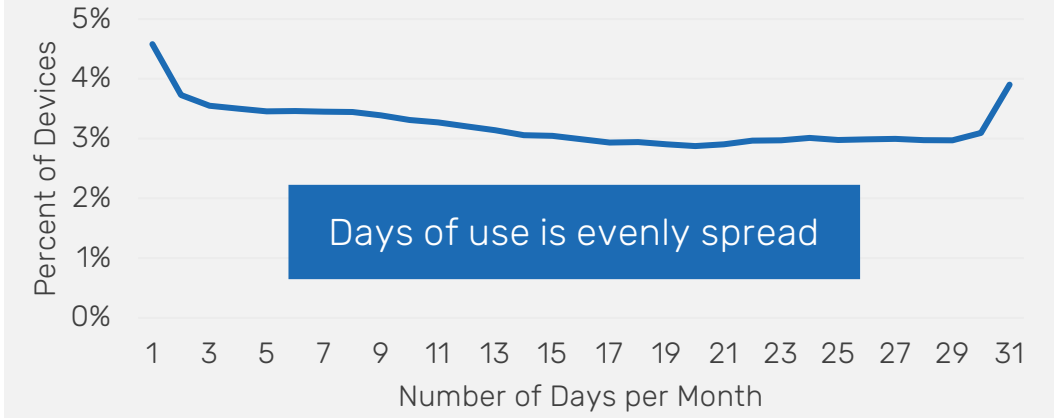
Service Provider Wi-Fi | General Stats

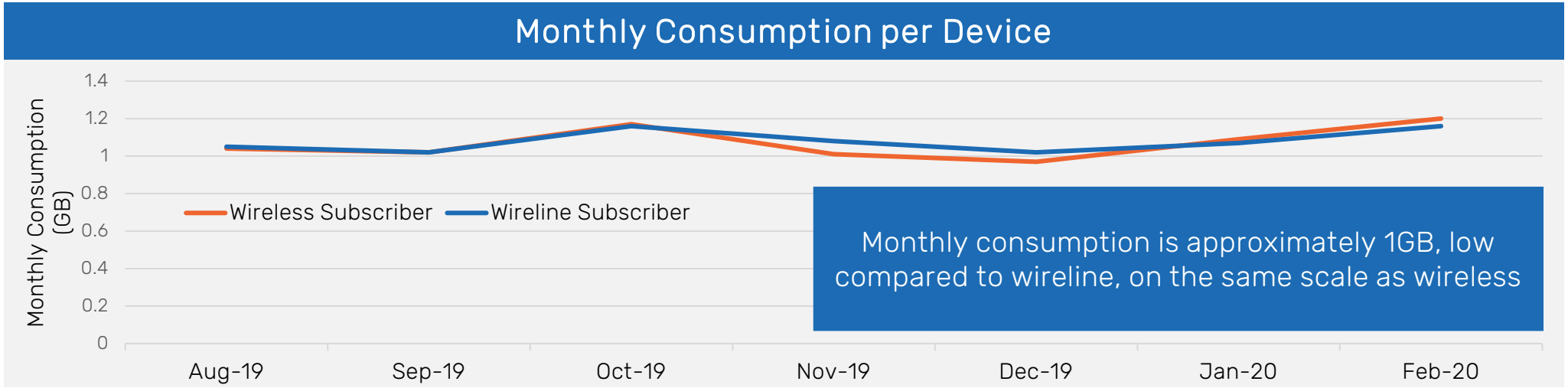
Devices per Account



Days of Use per Month



Monthly Consumption per Device



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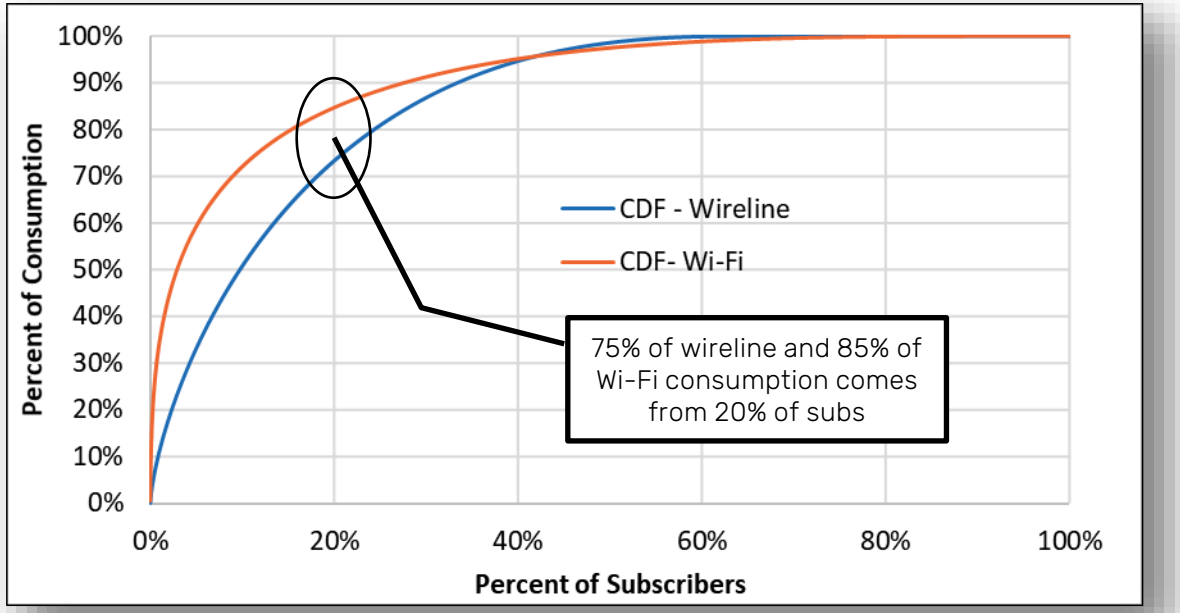

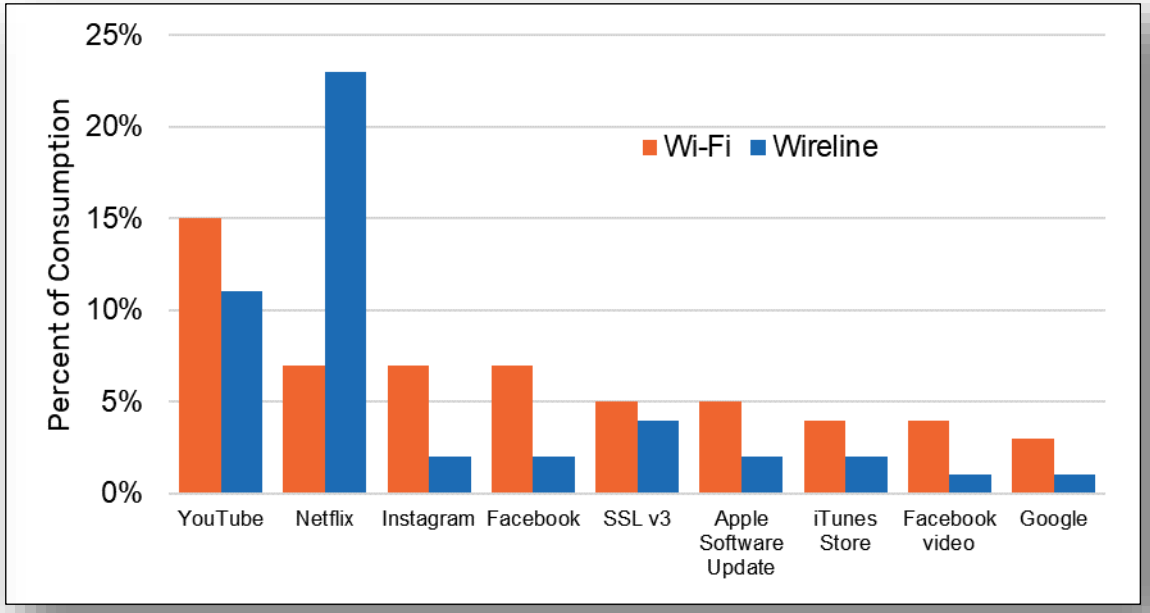

Cumulative Distribution Functions

Wireline and Wi-Fi consumption are both highly weighted toward a small percentage of users, Wi-Fi slightly more so. 20% of wireline subscribers account for 75% of consumption, while 20% of Wi-Fi subscribers account for 85% of consumption

Application Use

Both wireline and Wi-Fi network traffic is dominated by video. YouTube accounts for the most Wi-Fi consumption with shorter content designed for smaller screens, while Netflix dominates wireline consumption due to longer content and larger screens

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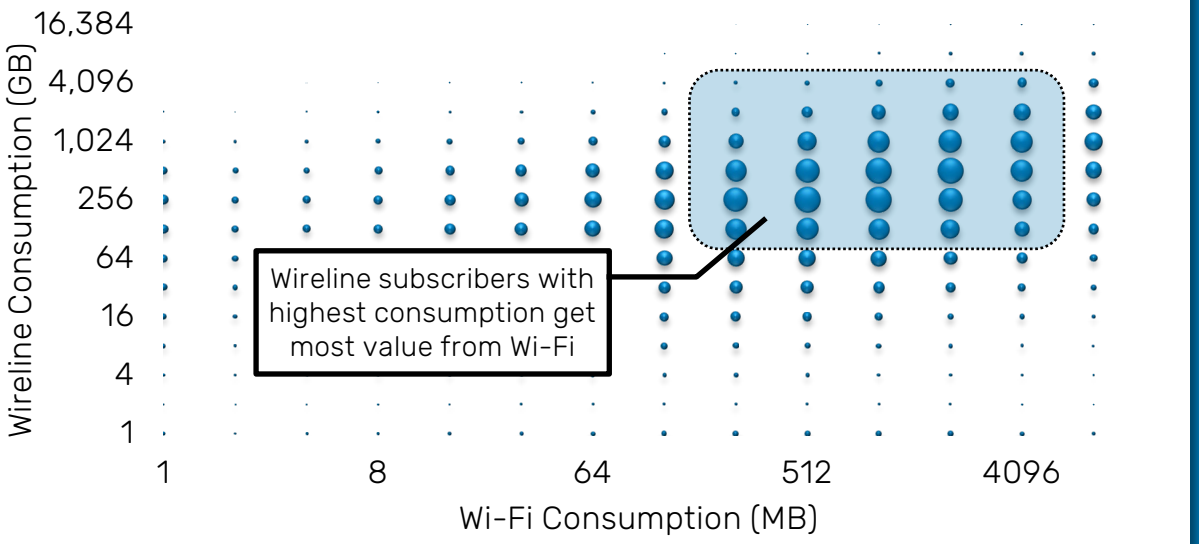
Contrasting Wireline & Wi-Fi Consumption

Bubble size indicates number of subscribers



Contrasting Wireless & Wi-Fi Consumption

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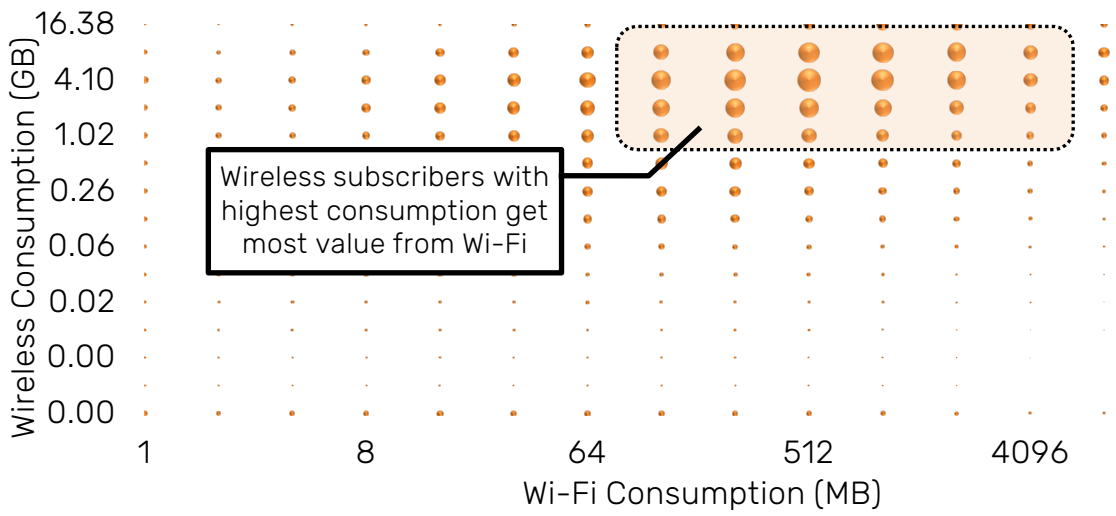

- Subscribers with **heavy Wi-Fi** consumption **tend** to also have **heavy wireline/wireless** consumption

- **Wi-Fi consumption** is **similar** between **wireline** and **wireless subscribers**, but wireline accounts have **two devices** on average **per account**

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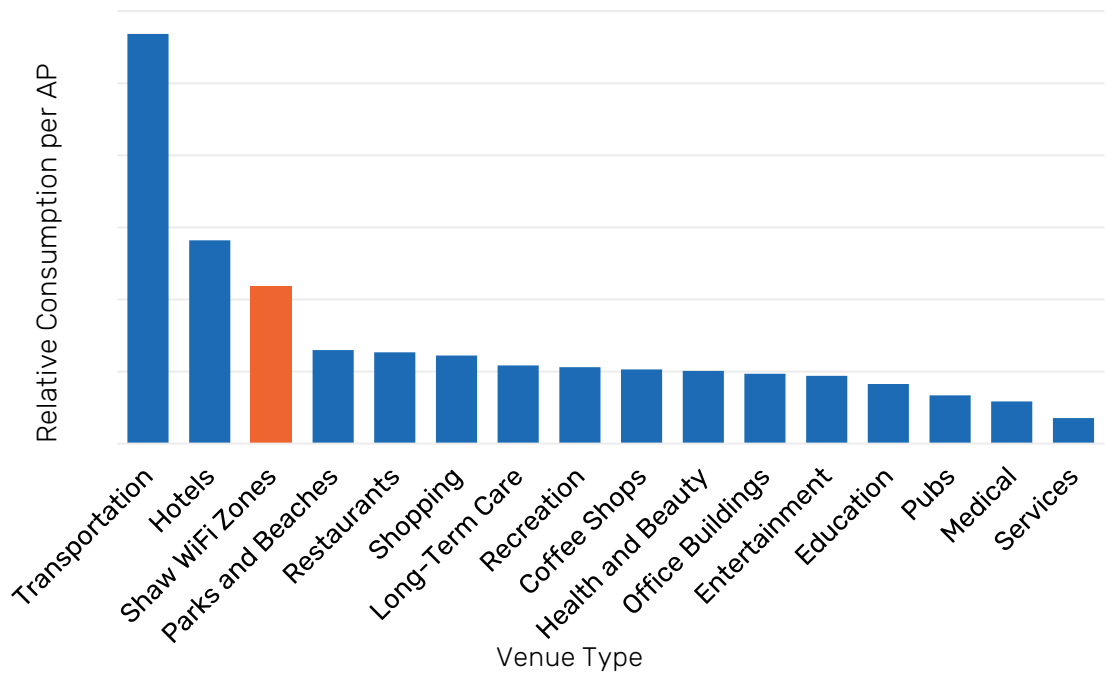
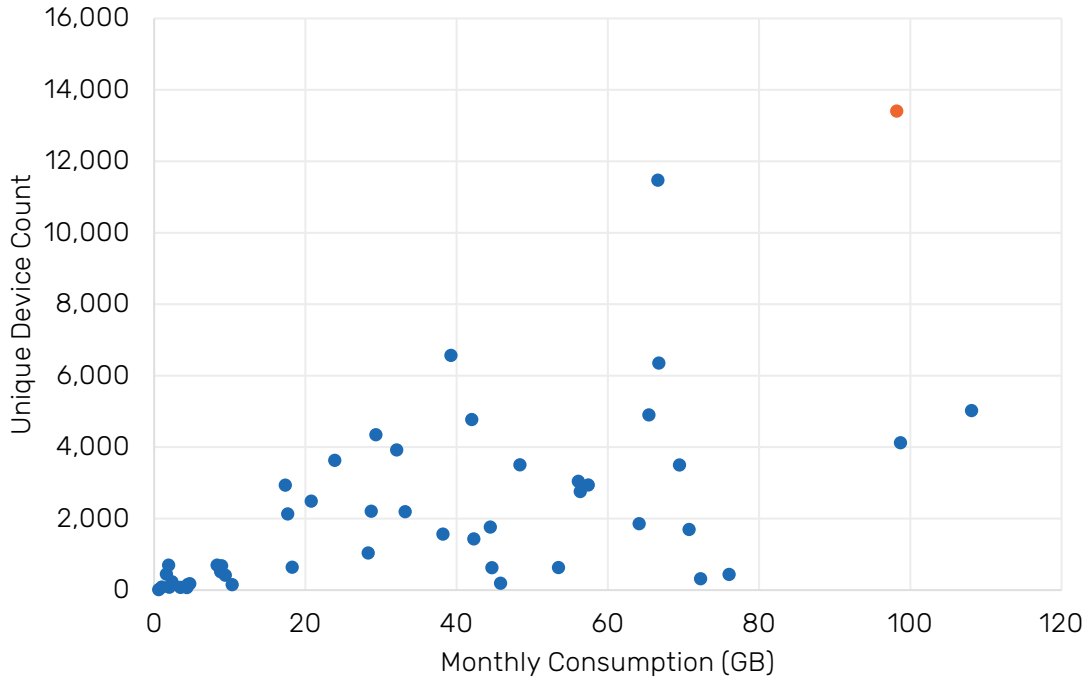
Service Provider Wi-Fi | Venue Analysis



- Wi-Fi APs were installed at many types of venues
- Transportation, Hotels and Wi-Fi Zones had higher consumption per AP than other venues
- One Wi-Fi Zone in particular was thought to be causing customer experience issues and was investigated



- The venue coverage was provided by outdoor strand mounted APs
- The variation between APs in terms of unique devices and monthly consumption was large
- The AP in the top right was further investigated

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Service Provider Wi-Fi | Venue Analysis

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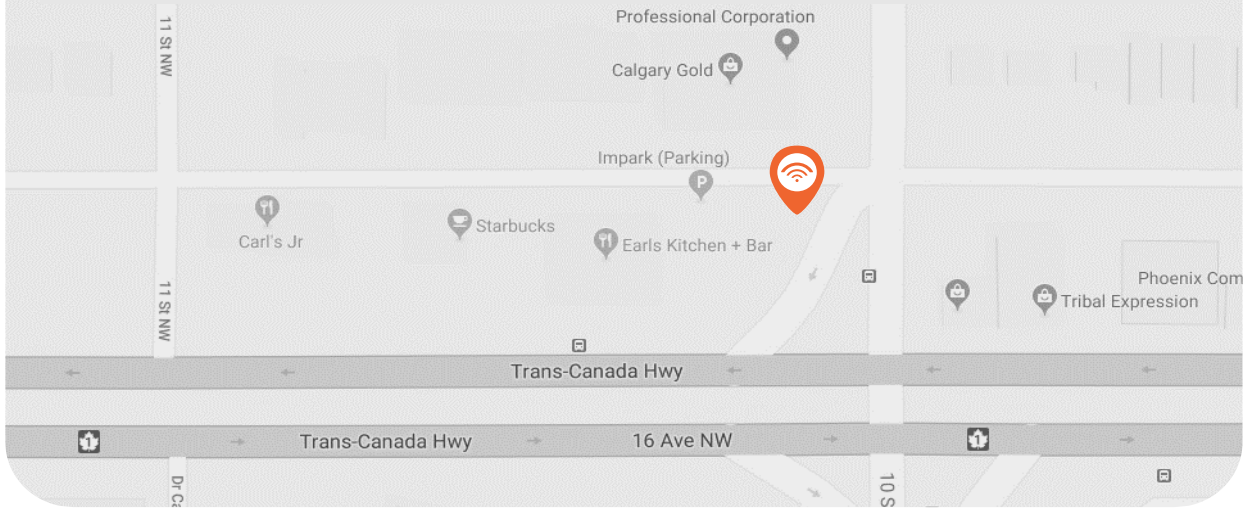
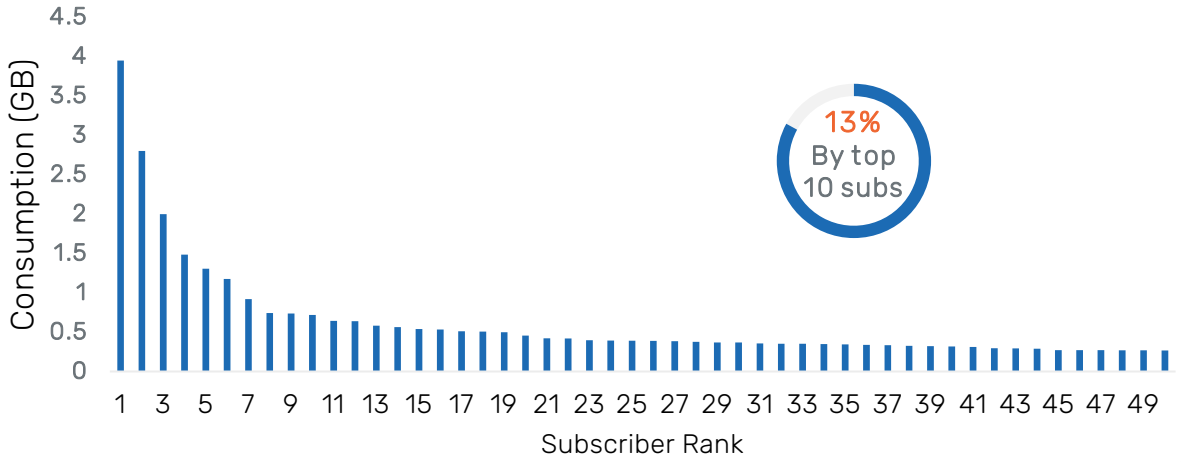
Popular Intersection

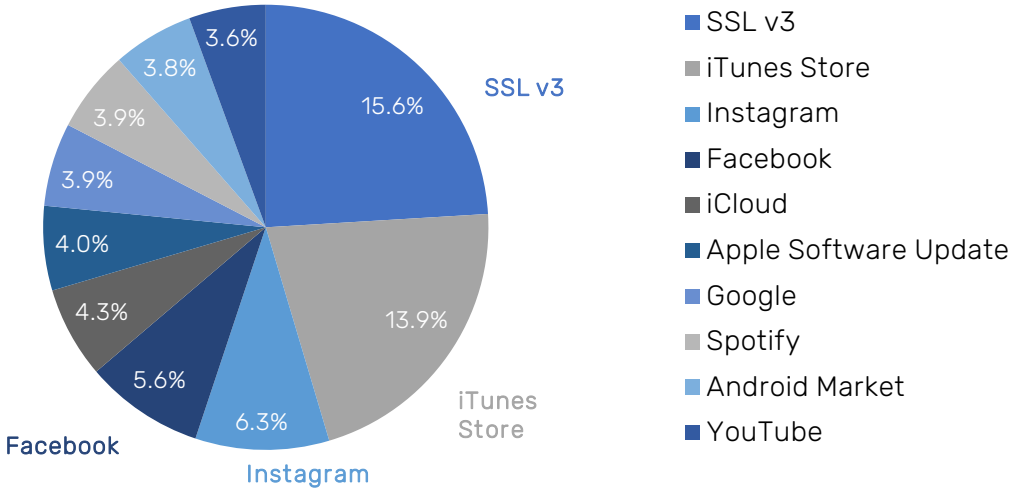
13k Devices/mo



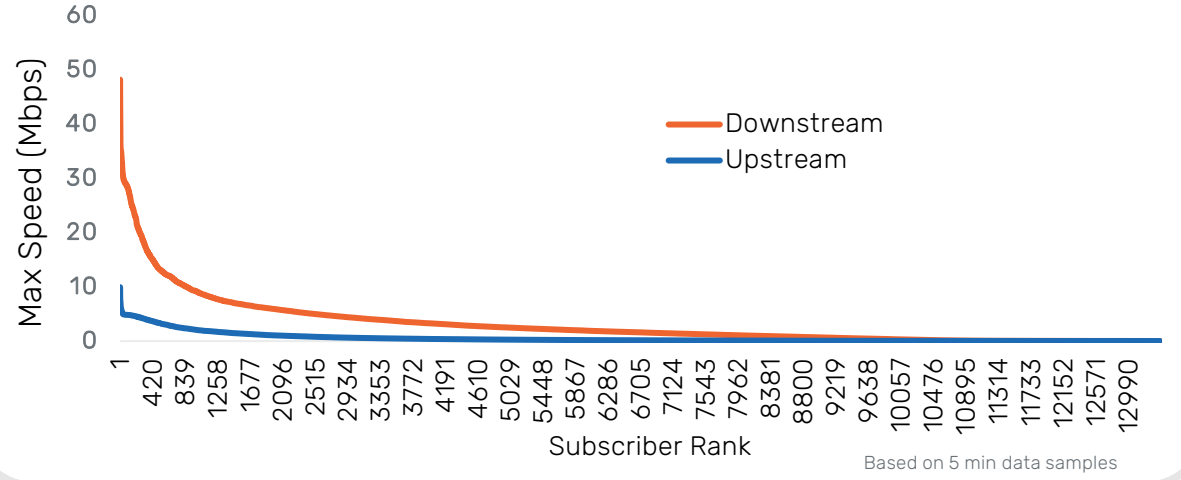
Highest Consumption (DS+US) by Device



Protocol Mix – Social and Web dominate

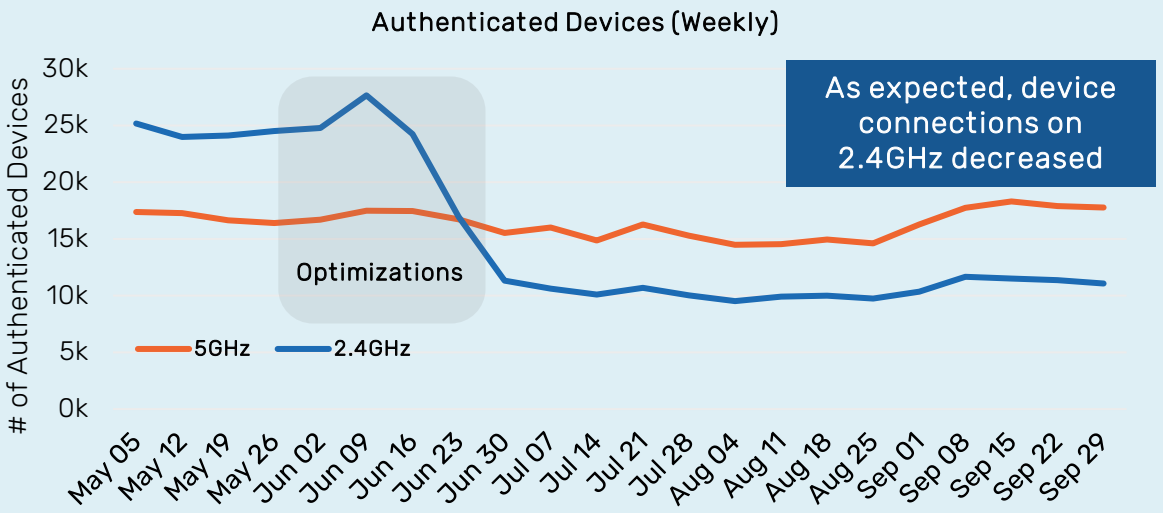


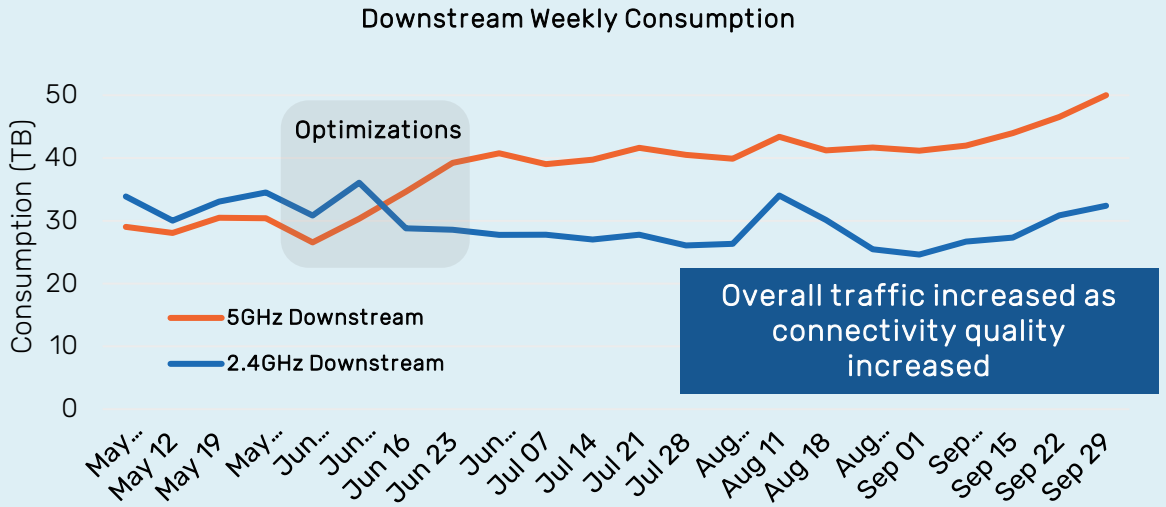
Max Speed by Device – Majority well below 10Mbps peak



Based on 5 min data samples

Optimizations prevented users with very low signal levels from connecting





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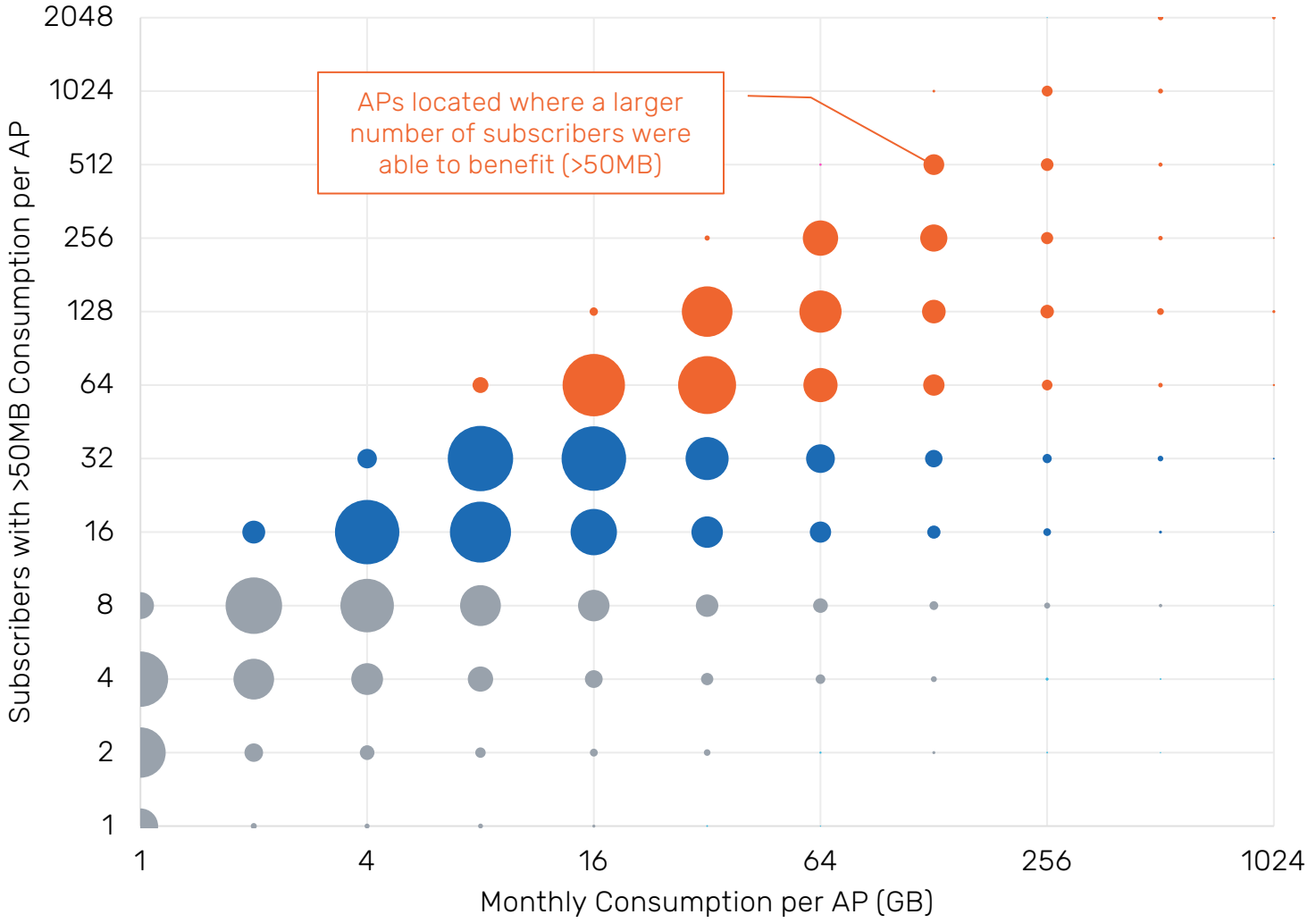
- A **methodology** was required to decide the **priority** in **upgrading** APs **to Wi-Fi 6**
- The decision was made to use **number of subscribers** that **consumed** more than **50MB** per month at the AP
- 50MB was chosen as it provides **tangible offload** as opposed to low consumption tasks such as checking email
- Goal is to **focus investments** where **customers** get the **most value**



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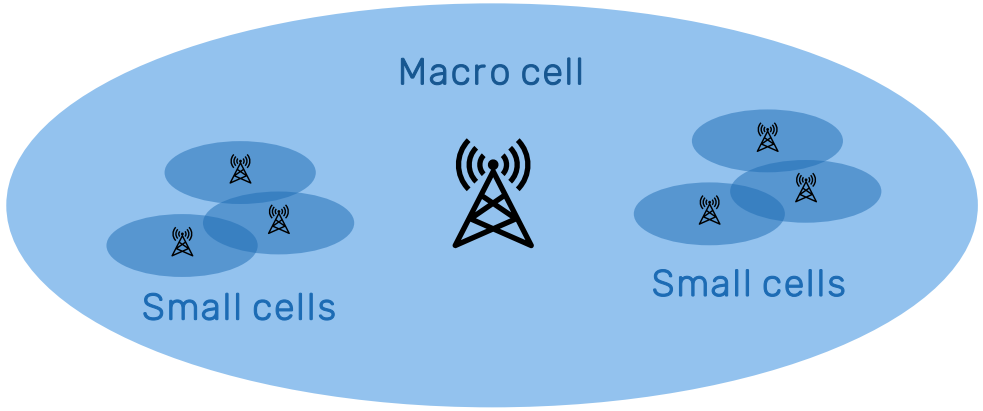
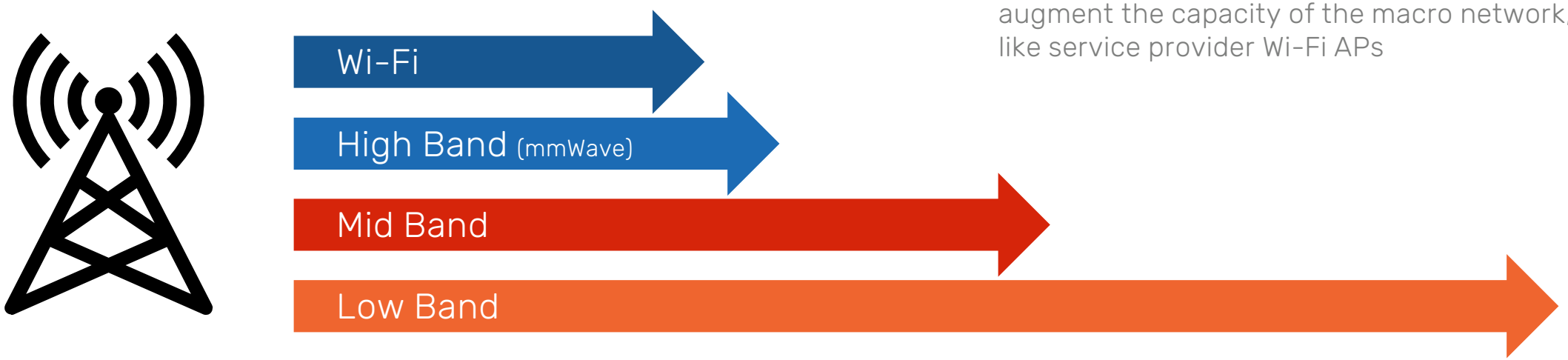


Small cells are similar to Wi-Fi APs

When it comes to capacity and coverage small cells, especially when using mmWave spectrum, look more like Wi-Fi APs than macro cells

Requirement for placement

Small cells will be deployed where people gather to augment the capacity of the macro network, just like service provider Wi-Fi APs



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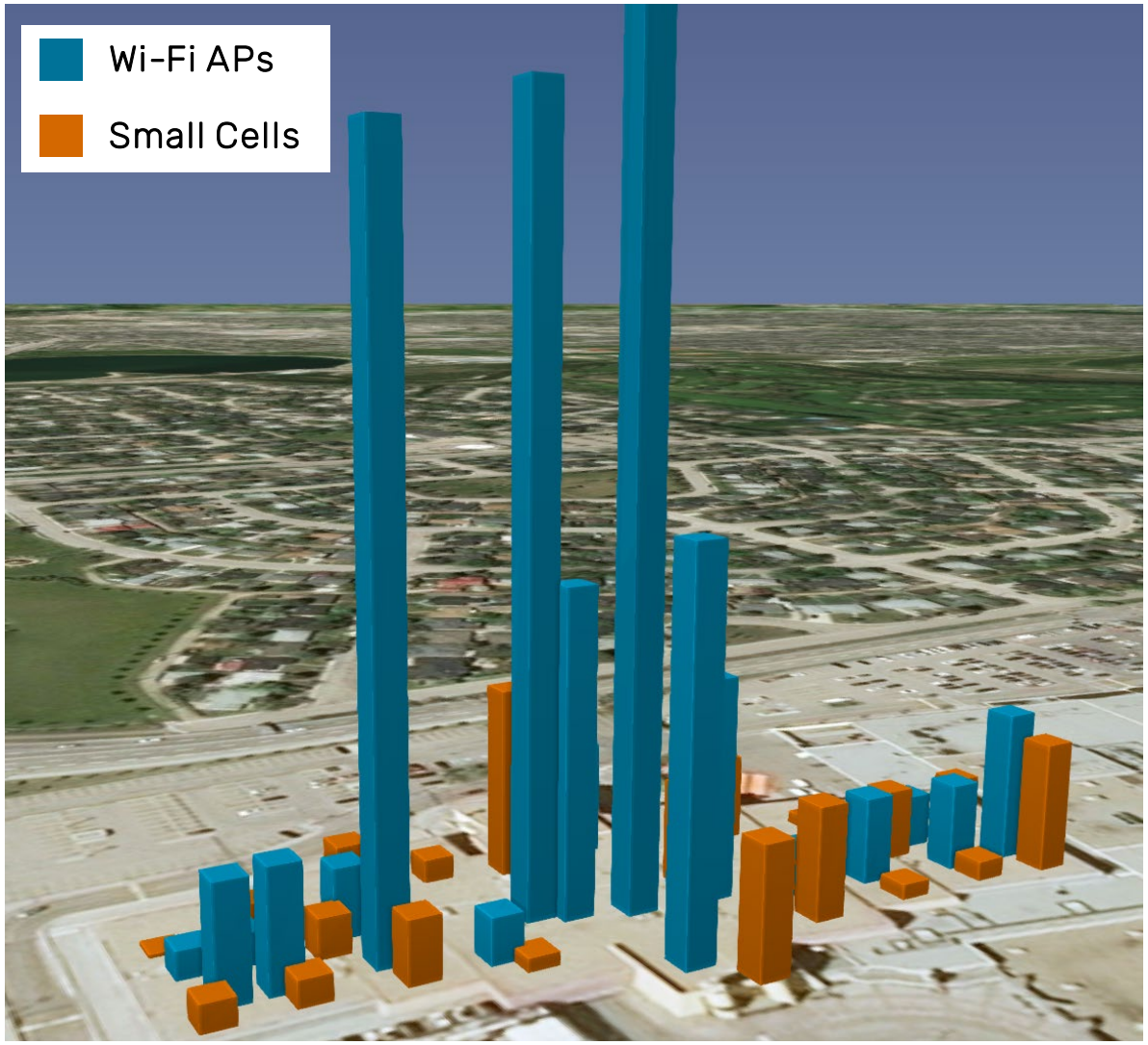
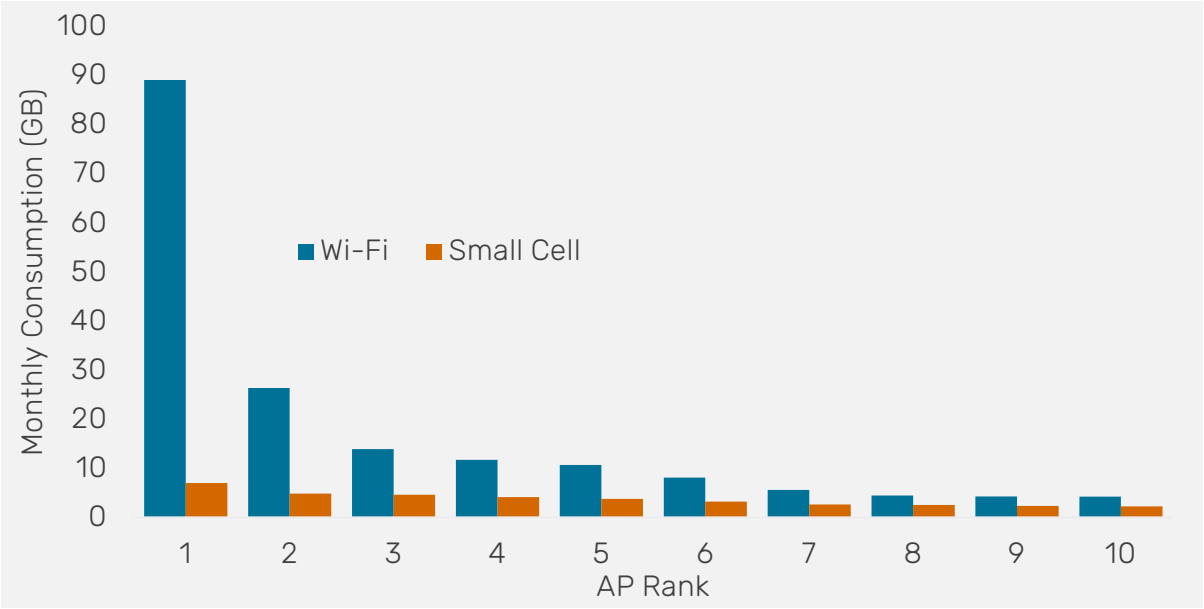


- **Both** service provider **Wi-Fi** and **small cells** were **deployed** to a venue
- RF **coverage planning** was done separately, but resulted in **similar placement**
- **Wireless subscribers**, who had access to **both networks**, had **4.4X** more **consumption** on the **Wi-Fi** network than the small cell network



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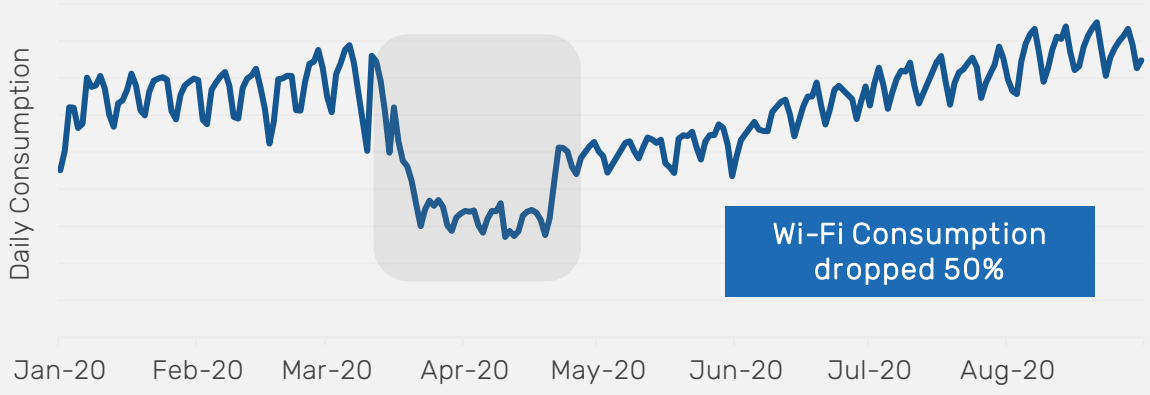
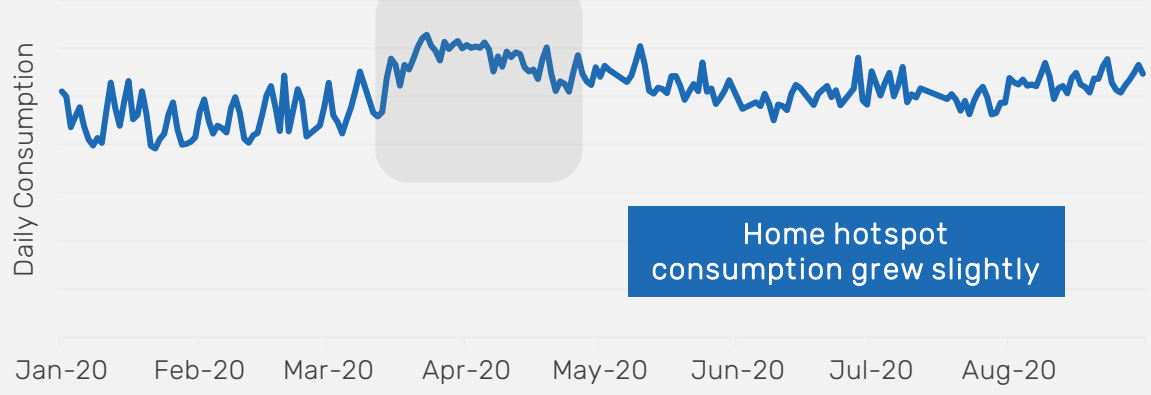
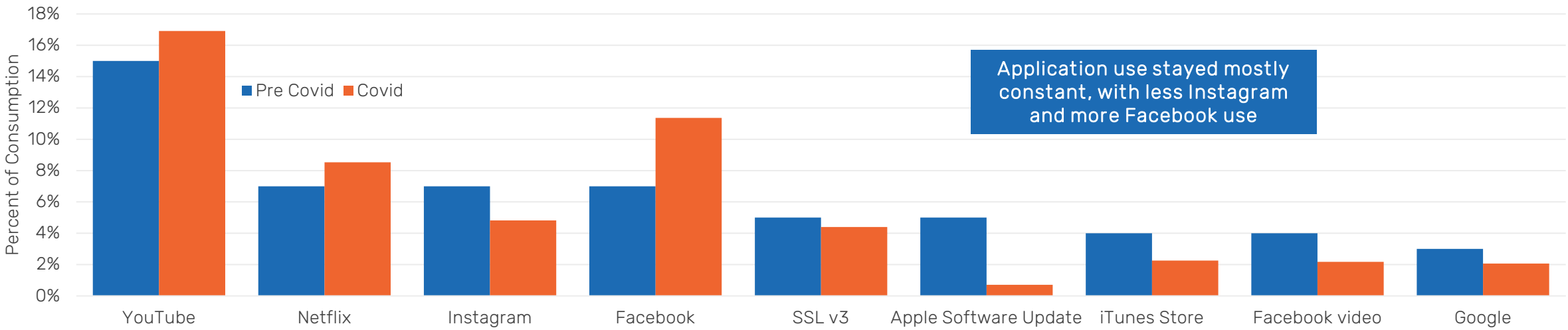
Service Provider Wi-Fi | COVID-19 Update

Service Provider Wi-Fi



Home Hotspot





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