



# Wi-Fi: connecting everyone and everything, everywhere

## MEETING OF THE CARIBBEAN SPECTRUM MANAGEMENT TASK FORCE

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# The global network of companies that brings you Wi-Fi



# Discussion Topics

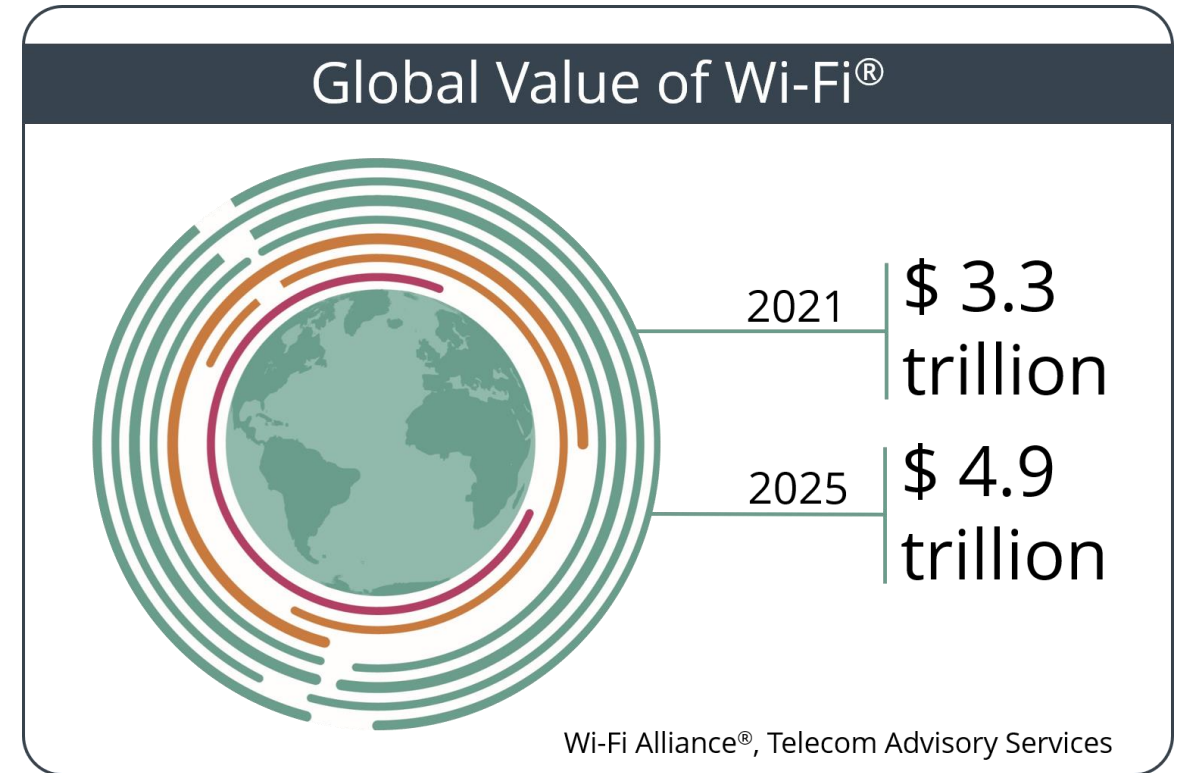
- Wi-Fi delivering socioeconomic value
- Wi-Fi role in telecom infrastructure/mitigating COVID pandemic
- Wi-Fi (Wi-Fi 6E) spectrum needs: 500 MHz vs. 1200 MHz
- Conclusions



# Wi-Fi Delivering Socioeconomic Value

# Economic value delivered by Wi-Fi to reach \$5 Trillion by 2025

- [Study](#) released February 2021 solidifies Wi-Fi as critical to economic resilience
- Value grows, even in times of crisis
- Ensuring [spectrum access](#) to enable innovation, advanced applications paramount to continuing benefits
- Developing economies demonstrate strong Wi-Fi value growth



[www.valueofwifi.com](http://www.valueofwifi.com)

[Global Economic Value of Wi-Fi \(2021-2025\)](#)

# Economic value components



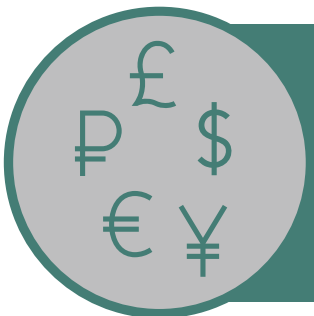
## CONSUMER SURPLUS

The difference between what consumers are willing to pay for a product or service relative to market price



## PRODUCER SURPLUS

The economic profit producers earn by providing the product or service



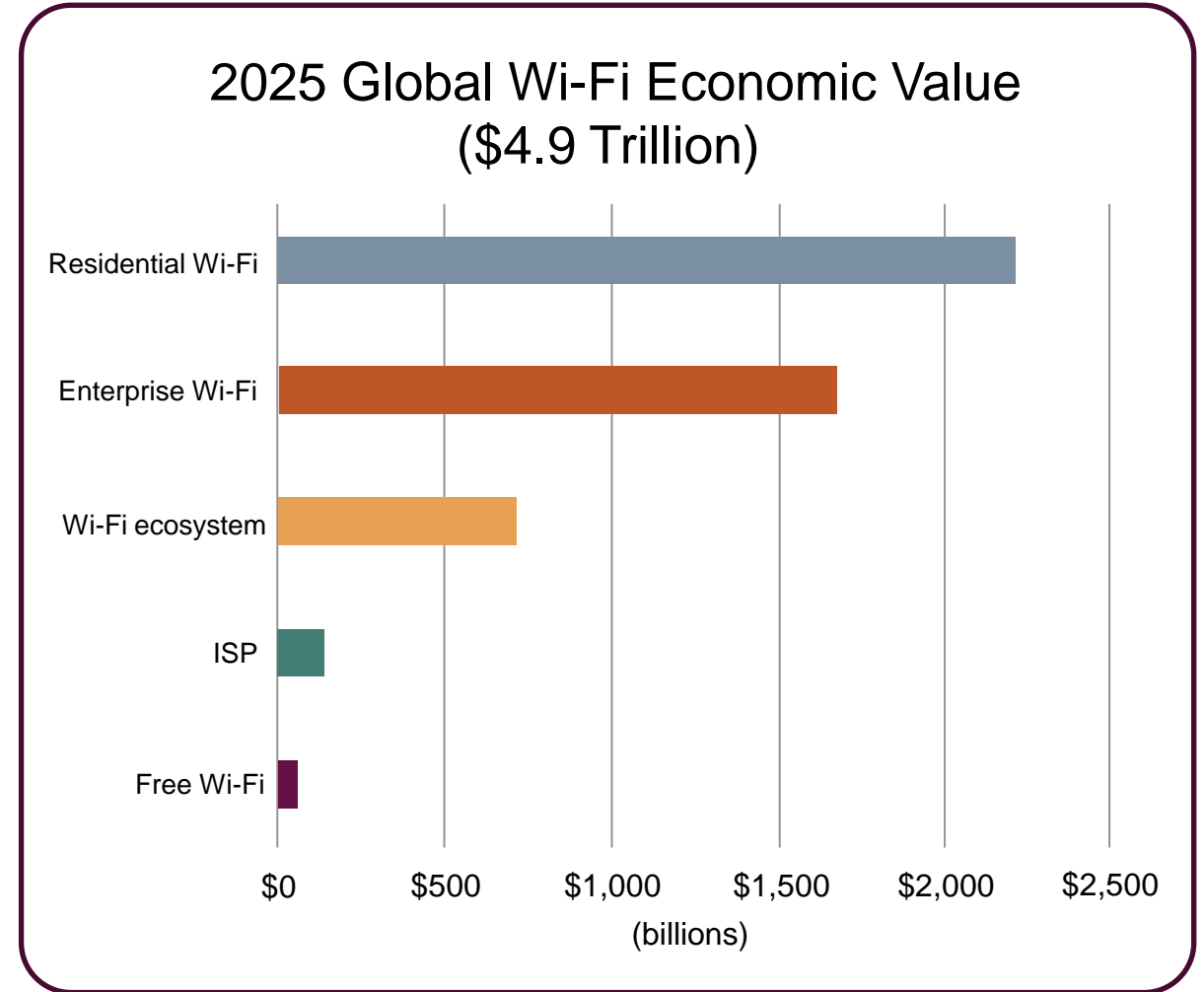
## GDP CONTRIBUTION

Gross Domestic Product: the final value of the goods and services produced in a country per year

ECONOMIC  
VALUE

# Main economic value drivers

- **Residential Wi-Fi:** Consumer savings over cellular
- **Enterprise Wi-Fi:** Digitizing business functions, minimizing wired infrastructure, enabling novel applications
- **Manufacturing, Wi-Fi ecosystem:** Product commercialization, cloud analytics, automation, streaming
- **Internet Service Providers (ISP):** Traffic offload and ISP services
- **Free Wi-Fi:** Public Wi-Fi hotspots



Source: Telecom Advisory Services analysis, Wi-Fi Alliance



# Wi-Fi value beyond economics

## Functional value

Essential utility for enterprise, education, home, logistics



## Social value

Important for psychological health: maintaining contact and relationships



## Community value

Key to bringing services and capabilities to remote and underserved areas

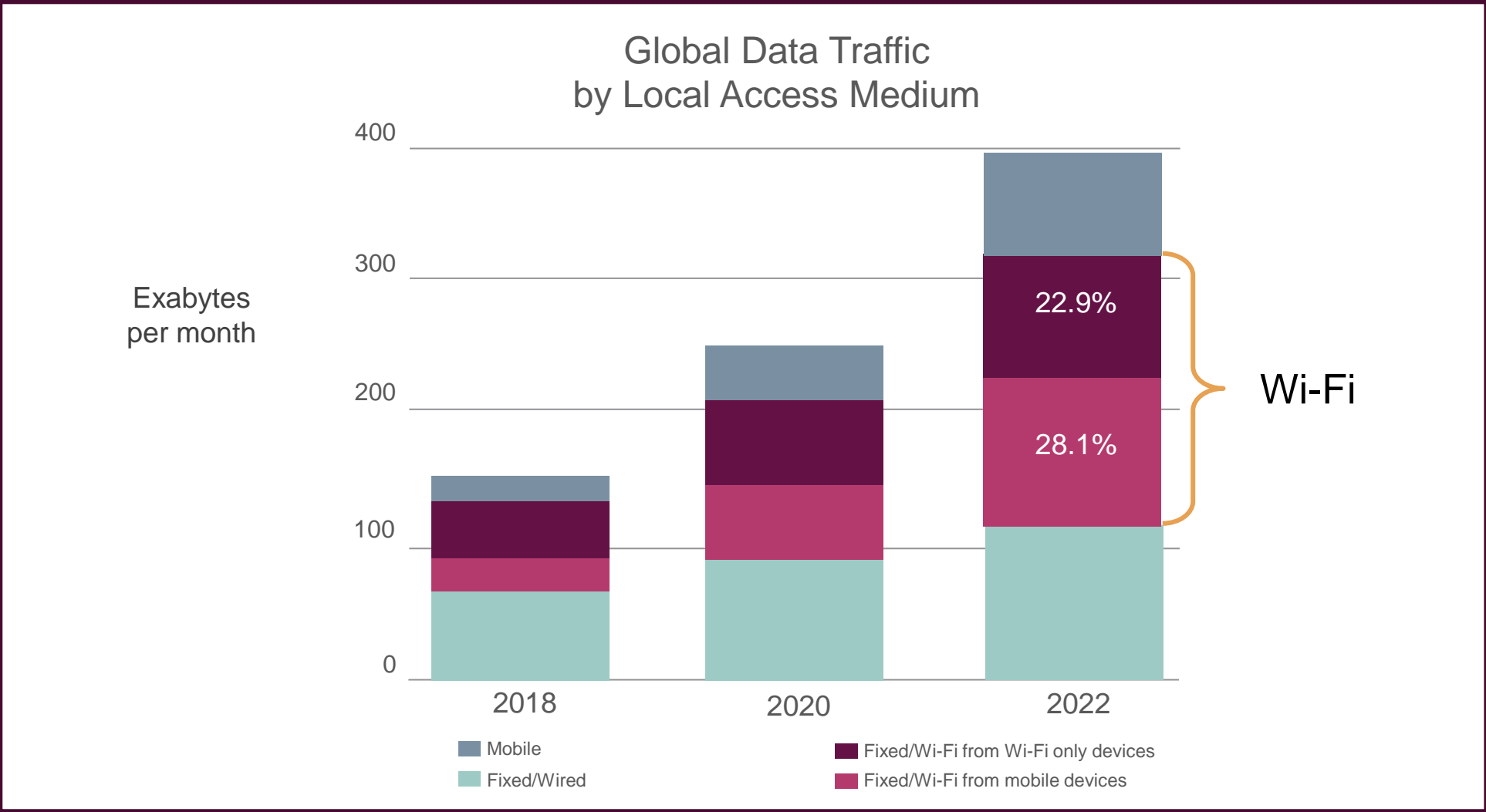






# Wi-Fi role in telecom infrastructure and in mitigating COVID pandemic

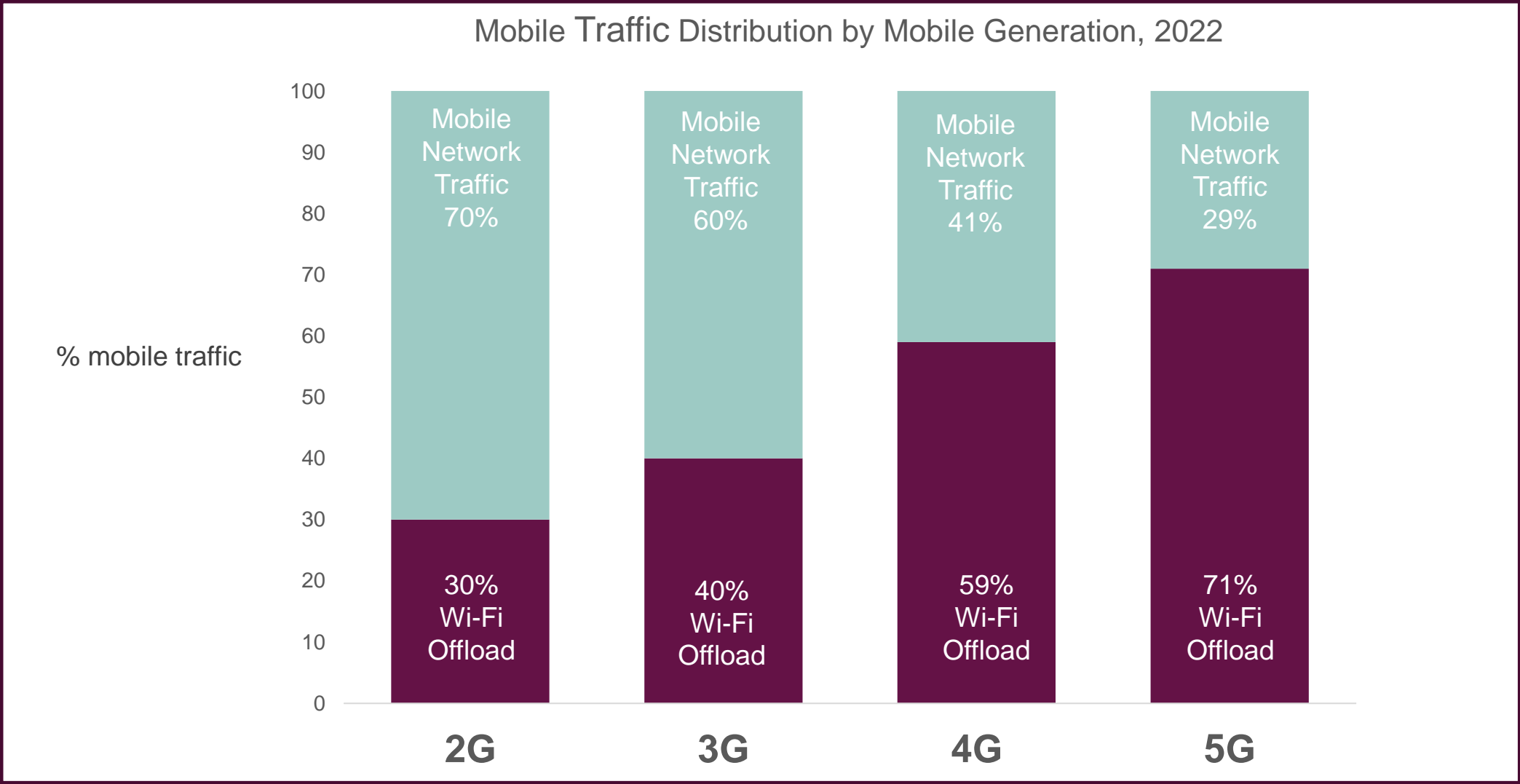
# Wi-Fi delivers more than half of all internet traffic



Source: Cisco VNI IP Traffic Forecast, 2017-2022



# From 2G to 3G to 4G to 5G: Traffic Offload to Wi-Fi continues to grow



# Need for Wi-Fi access surges during COVID pandemic

Average daily data  
volume increase

62%

From 6.5 GB to over 11.5 GB

116%

Increase in  
upstream traffic

Due to **video conferencing** and online  
**file sharing/storage** usage

Up to ↑ 94%

**Wi-Fi activity increase** compared to  
pre-lock-down (during working hours)

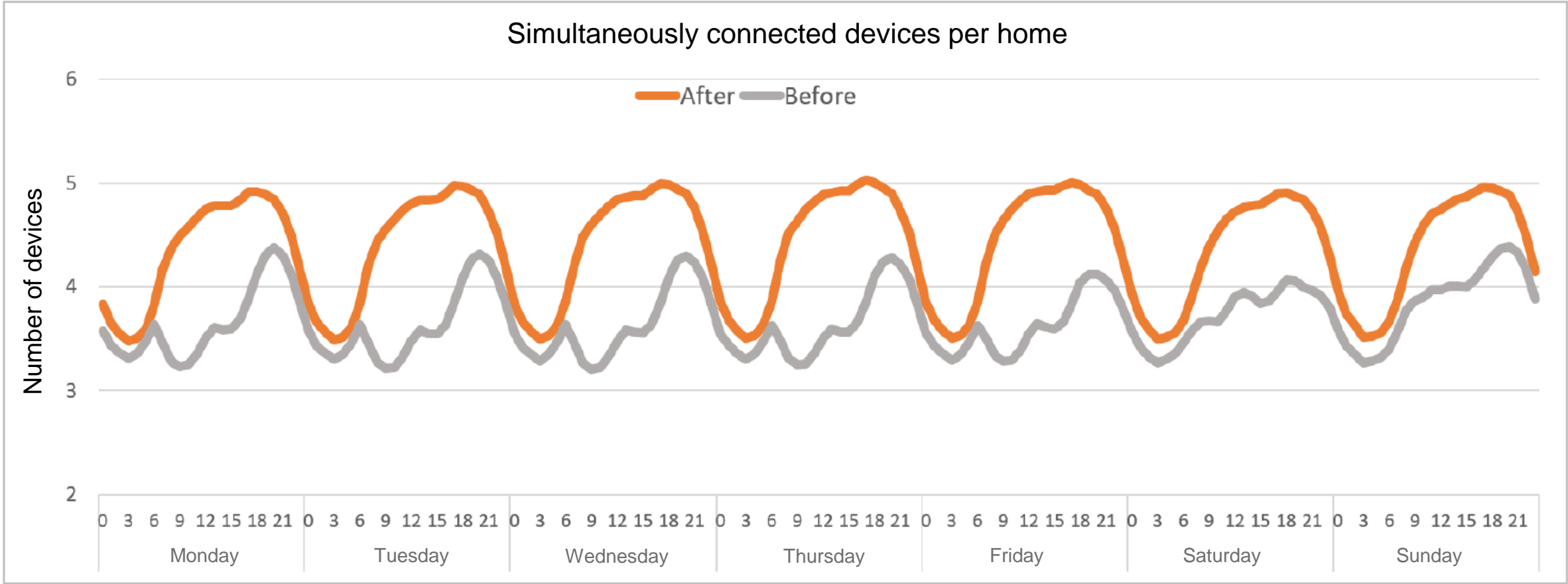
32%

Homes experienced  
Wi-Fi coverage issues

Compared to 19% before lockdown

Source: [The Catalyst Effect](#), AirTies

# Working from home: 30-40% increase in simultaneously connected devices compared to pre-lockdown

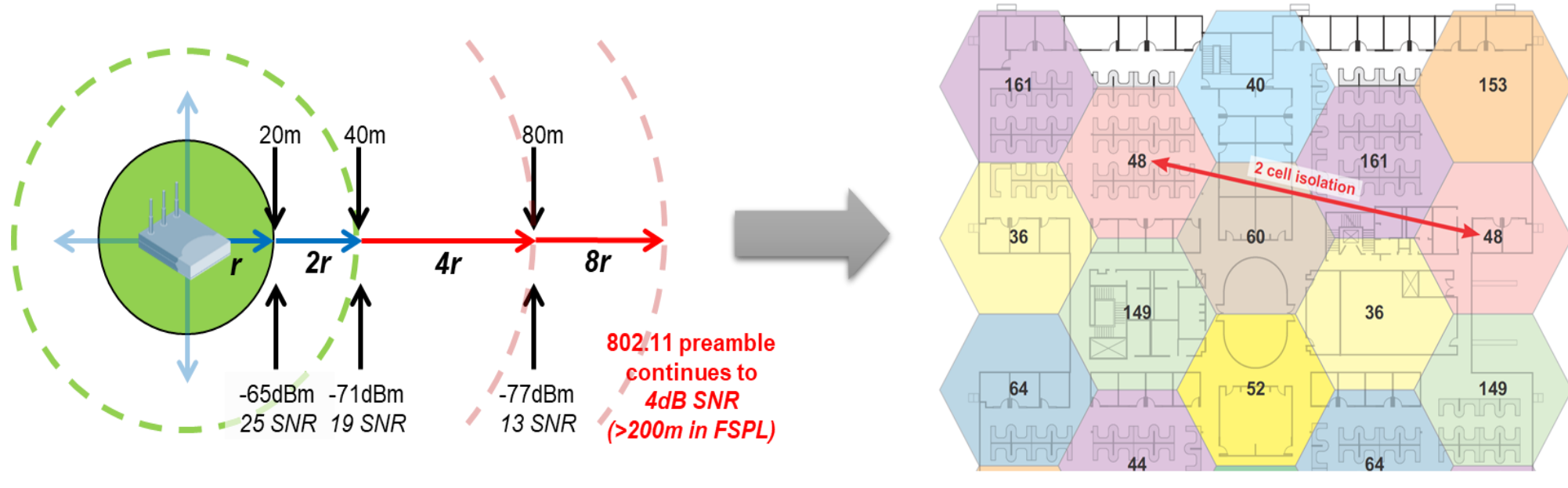


Source: [The Catalyst Effect](#), AirTies



# Wi-Fi Performance Depends on Channel Diversity

## Self-Coordination Requires 2+ Cell Isolation



Wi-Fi devices are self-coordinating – relying on Contention Based Protocol (SNR is a major factor)

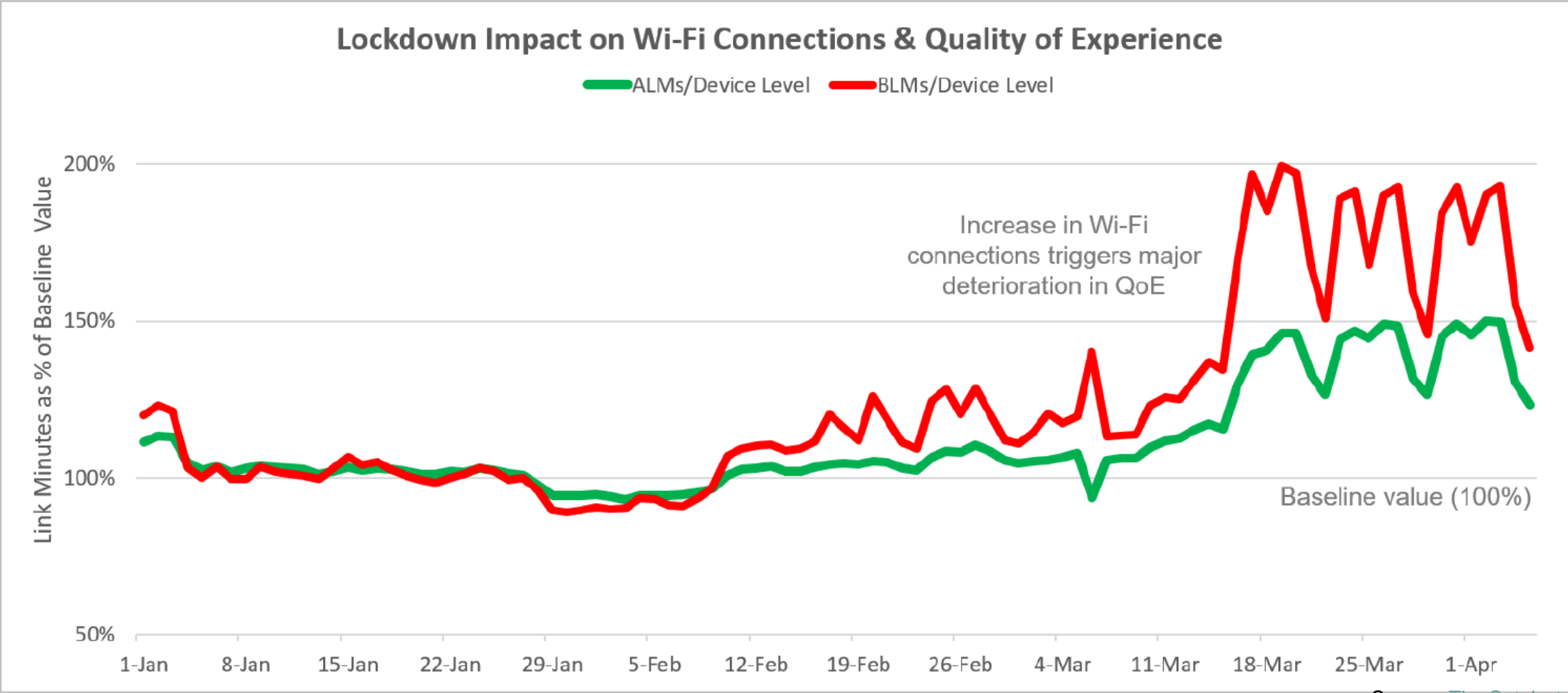
- Fewer channels Increase collision probability and raise noise floor - under surge conditions, systems can become unusable

More channels ensure higher data rates, lower latency, optimal performance

- During busy hour surges, more channels enable self-coordinated systems to absorb extremely high loading levels by distributing demand and keeping data rates high

# Impact on Wi-Fi User Experience

(Active Link Minutes vs. Bad Link Minutes)



Source: [The Catalyst Effect](#), AirTies





## *Upshot:*

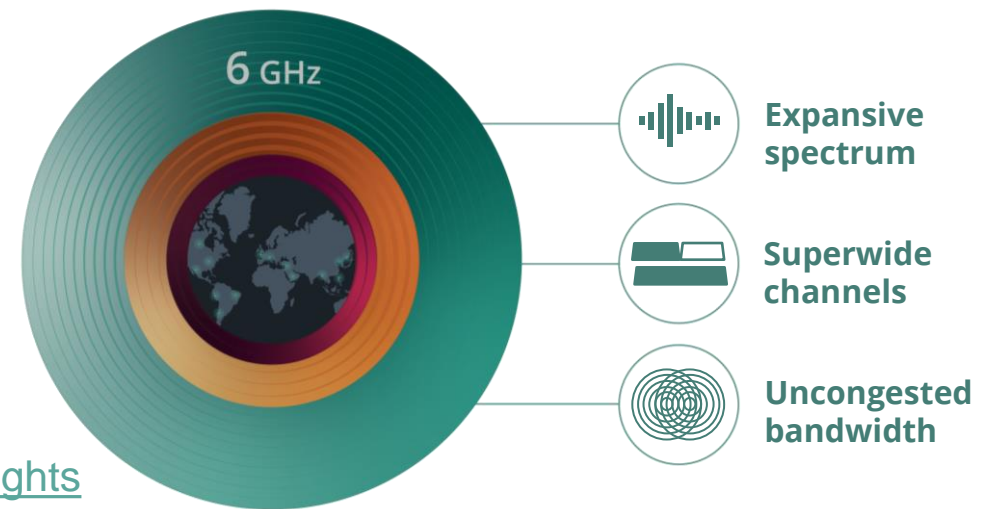
Increased data traffic and number of active devices exhaust available spectrum capacity, causing performance degradation when it is needed most



# 6 GHz Wi-Fi (Wi-Fi 6E) Spectrum Needs 500 MHz vs. 1200 MHz

# Good news: Regulators are acting on the future of connectivity

- 6 GHz Decisions -- transformative to Wi-Fi ecosystem
- Administrations in the Americas, APAC and EMEA are making 6 GHz spectrum available for Wi-Fi, recognizing Wi-Fi role in the national telecom infrastructure
- Industry galvanized to deliver [Wi-Fi 6E](#) technology and devices in record time
- [Wi-Fi 6E brings](#):
  - Better speed, capacity, and latency
  - Quality in demanding environments
  - Advanced connectivity experiences
  - Tailored power consumption for IoT
  - New innovative possibilities



[Wi-Fi 6E highlights](#)

[Wi-Fi 6E video](#)

Wi-Fi Alliance®

# Delivering Gigabit Connectivity with Wi-Fi

- Gigabit connectivity is a policy priority – but connectivity is only as good as the narrowest bottleneck
- Governments and wireline providers invest considerable resources to provide Gigabit infrastructure – but over 50% of data traffic is delivered by Wi-Fi
- Wireline consumers pay for Gigabit connectivity – but most connect via Wi-Fi

## Gigabit Requires 80 / 160-MHz Channels

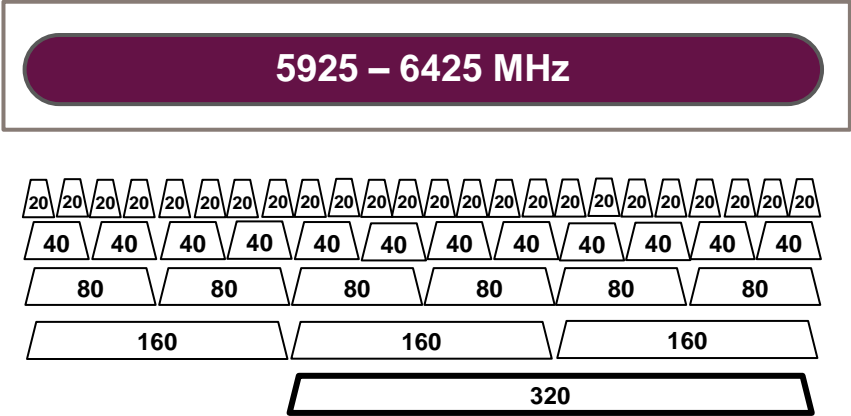


Sources: Aruba Networks Hewlett Packard Enterprise

# Why does Wi-Fi need access to 5925-6425 MHz and 6425-7125 MHz (1200 MHz)?



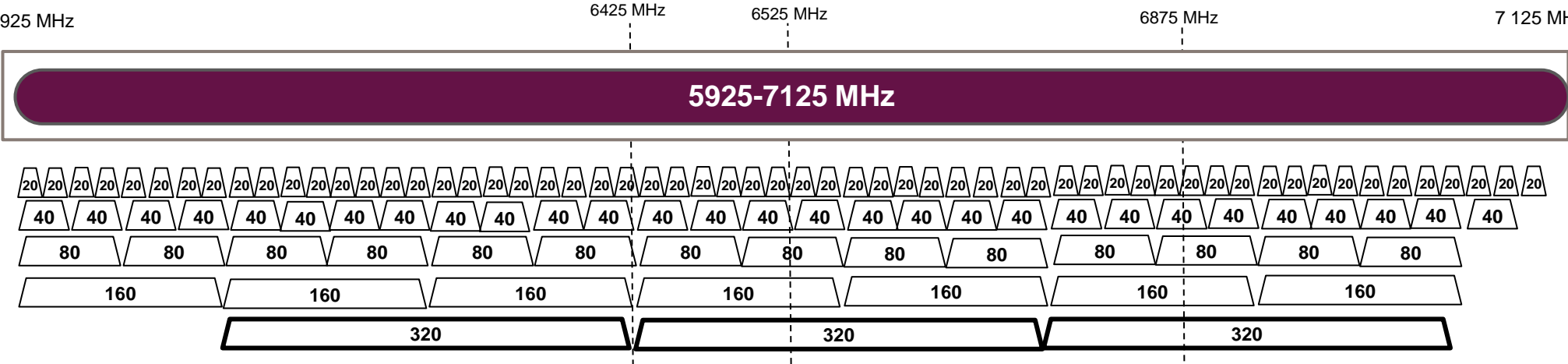
24 x 20 MHz  
12 x 40 MHz  
6 x 80 MHz  
3 x 160 MHz  
1 x 320 MHz



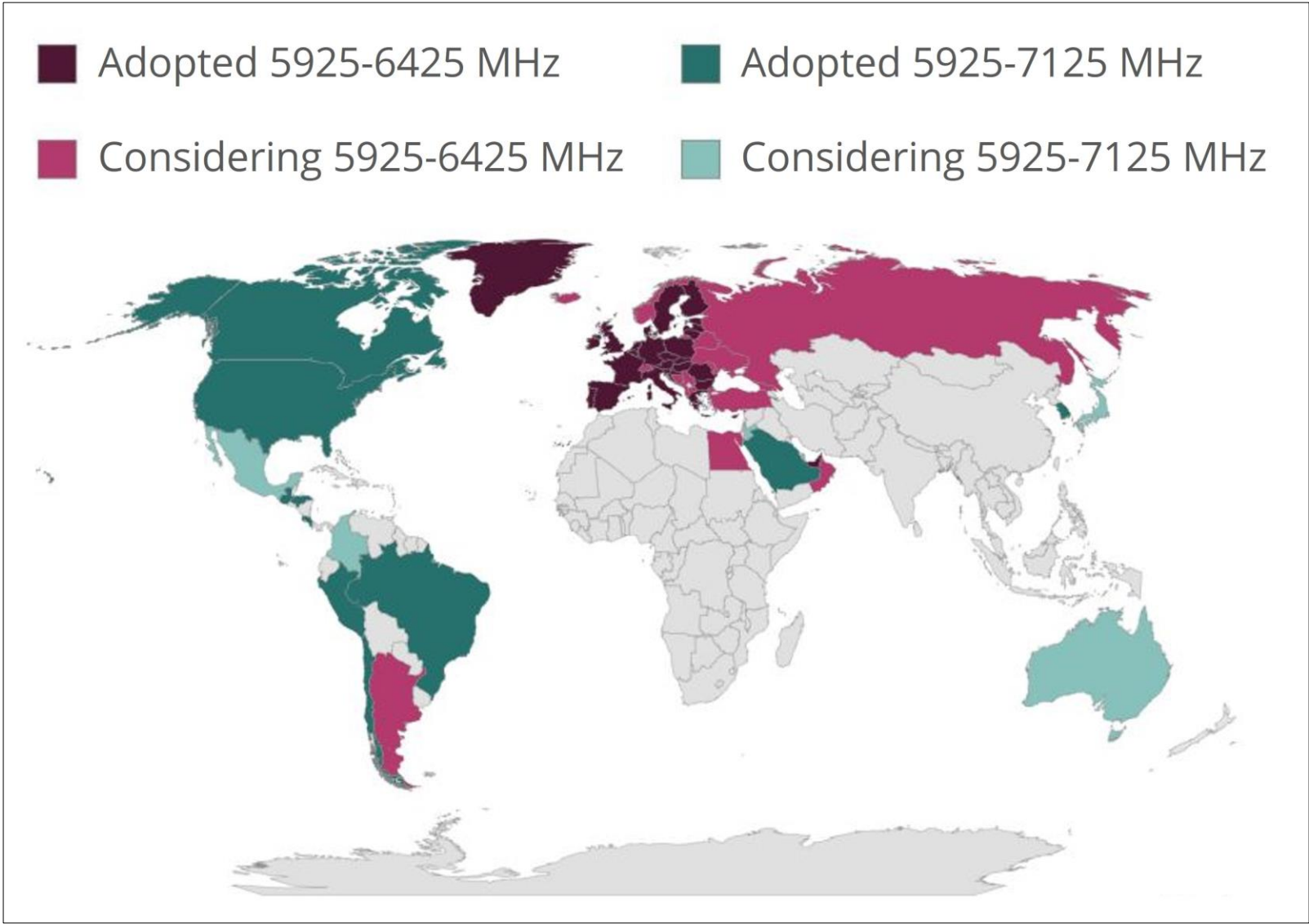
- Fact: Unlicensed technologies (e.g., Wi-Fi) relying on dynamic random spectrum access and contention-based protocols require access to multiple channels to maintain acceptable performance
- Fact: Next Generation [Wi-Fi 7](#) (IEEE 802.11be) designed for Extremely High Throughput -- channel bandwidth of up to 320 MHz

Countries in Region 1, 2 & 3

59 x 20 MHz  
29 x 40 MHz  
14 x 80 MHz  
7 x 160 MHz  
3 x 320 MHz



# Countries Enabling Wi-Fi 6E





# Conclusions



# Conclusions – RLAN access to 6425-7125 is essential and feasible

- Wi-Fi delivers economic value and jobs
  - Wi-Fi is used more than ever: Wi-Fi is integral to telecom infrastructure, and essential through crises such as the COVID-19 pandemic
- Wi-Fi spectrum requirements exceed 500 MHz
  - 5925-7125 MHz band is uniquely suited to meet growing demand for Wi-Fi connectivity – no alternative spectrum now or in the future
  - Next generation of Wi-Fi ([Wi-Fi 7](#)) depends on access to multiple wider (320 MHz) channels S
- [Wi-Fi 6E](#) deployment in 5925-7125 MHz already underway in countries around the world – over 300 million Wi-Fi 6E devices in 2021
- Allow Wi-Fi 6E to deliver connectivity benefits now

# WRC 23 Agenda Item 1.2: IMT deployment in 6425-7125 MHz is **not feasible**

- Commercially viable IMT network coexistence with incumbents in 6425-7125 MHz **is not feasible**
  - Operations only in “metropolitan areas” – not feasible
  - IMT small-cells at 200 mW indoor – not feasible -- much more expensive than RLANs; how is this even IMT?
- Relocation of 6425-7125 MHz incumbents **is not feasible**
  - Thousands of Fixed links
  - Protection of FSS uplinks in 6425-7125 MHz (including Appendix 30B) -- not feasible
- Global or even Regional IMT harmonization in 6425-7125 MHz **is not feasible**
  - Recent decisions by multiple administrations to allow RLAN deployment confirms intentions not to deploy IMT in 6425-7125 MHz
  - Market scale insufficient to support viable 5G/IMT ecosystem in the 6 GHz band

# Thank you

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## References



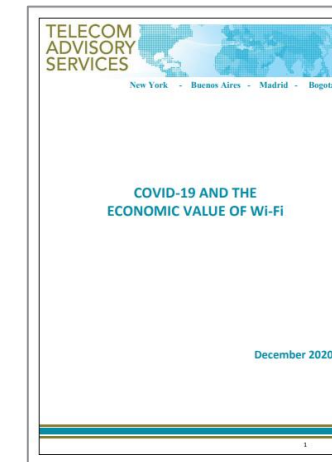
Highlights sheet



Study summary



Study details



COVID-19 and Wi-Fi