

GSMA | Ministerial
Programme

#MWC23MP

Affordability starts with Spectrum

How do pricing and effective
assignments impact connectivity?

Moderator

Lucas Gallitto
Head of LATAM
GSMA



Agenda

Agenda

Moderator: Lucas Gallitto, GSMA, Head of LATAM

Welcome Remarks

Luciana Camargos, Head of Spectrum, GSMA

12:15 – 12:20

The GSMA view

Luiz Felipe Zoghbi, Spectrum Engagement Director, GSMA

12:20 – 12:25

Regulatory Perspective

*Armando Fuentes Rodríguez
Administrador General, ASEP, Panamá*

12:25 – 12:30

*Stefan Schnorr, State Secretary
Federal Ministry for Digital and Transport, Germany*

12:30 – 12:35

New developments: Spectrum impact on QoS

*Ceri Howes, VP Government and External Affairs, Opensignal
Ian Fogg, VP Analysis, Opensignal*

12:35 – 12:45

Roundtable Discussion

12:50 – 13:40

Closing Remarks

13:40 – 13:45

Welcome Remarks

Luciana Camargos
Head of Spectrum
GSMA

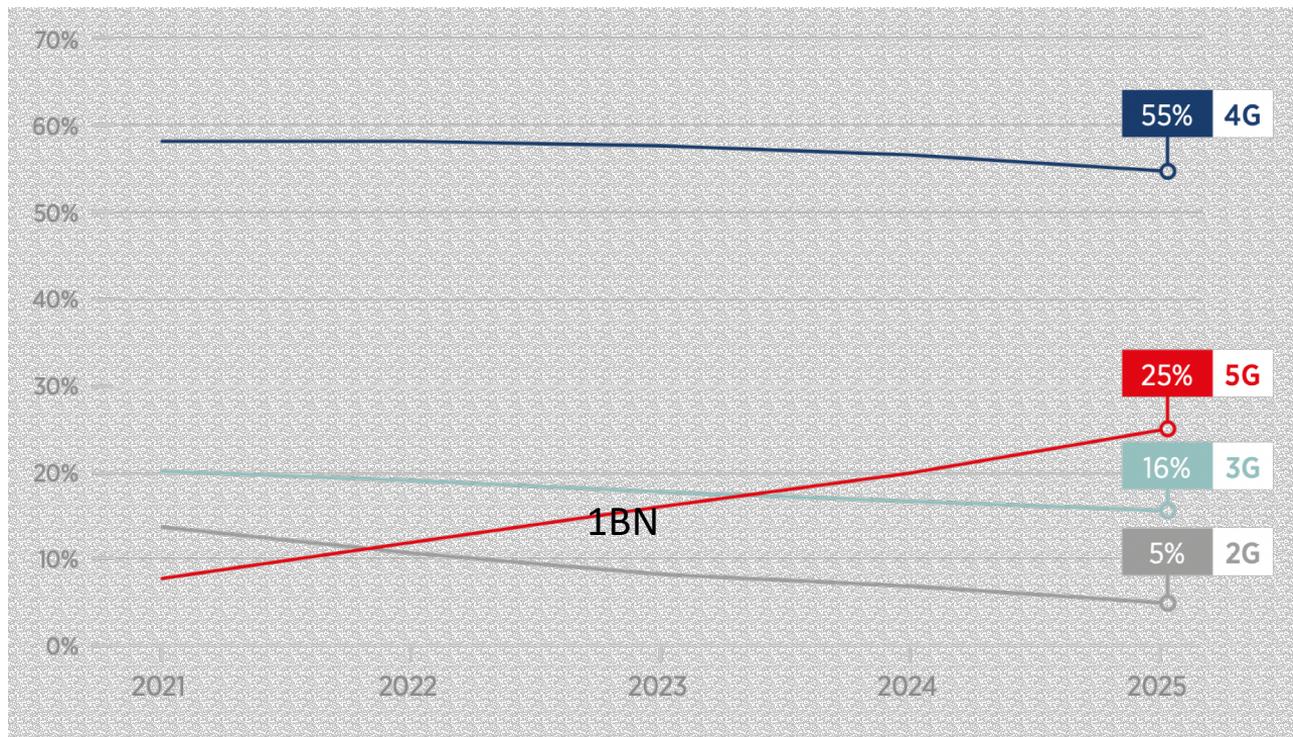


The GSMA view

Luiz Felipe Zoghbi
Spectrum Engagement Director
GSMA



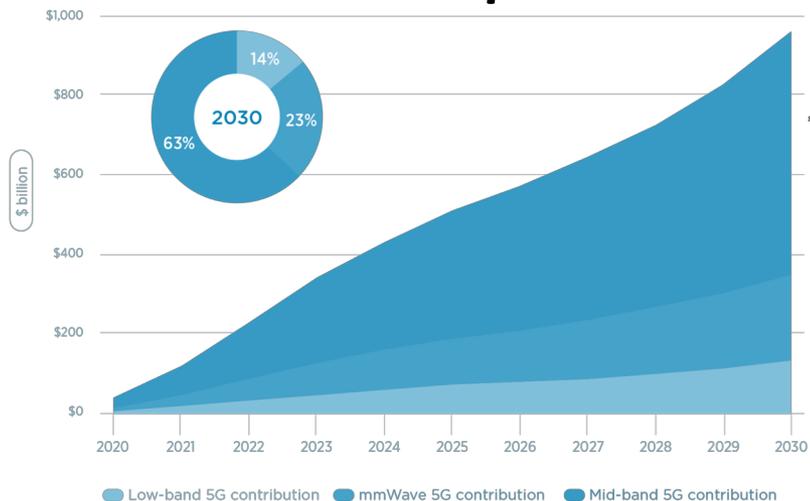
Connectivity evolves, more spectrum is needed



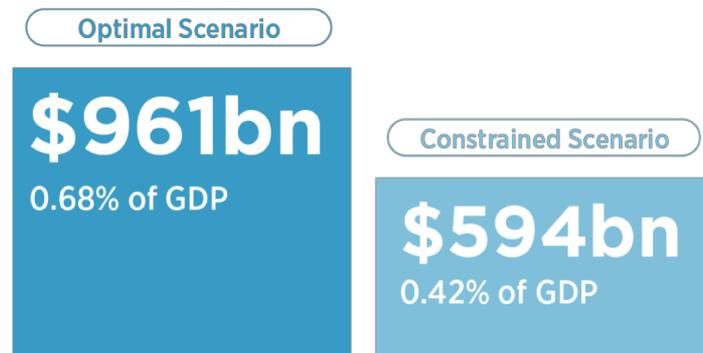
The right amount of spectrum unlocks socio-economic benefits

5G

CAN IMPACT GLOBAL
ECONOMY IN 2030 BY
\$961BN...

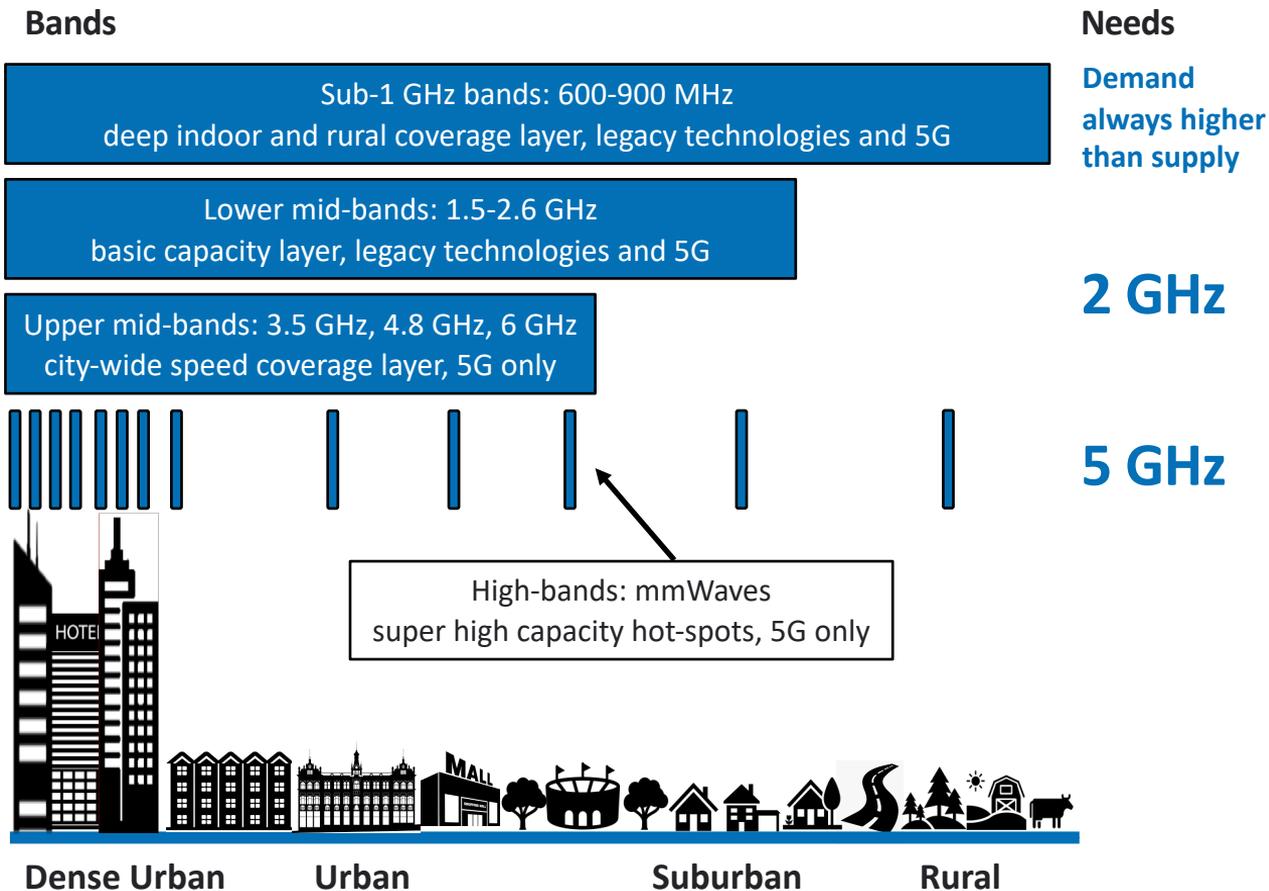


... BUT SPECTRUM CONSTRAINTS
RESTRICT VALUE



The Socio-Economic Benefits of Mid-band 5G GSMA
Intelligence 2022

Spectrum is needed across 3 ranges



The right T&Cs bring more investments

Legal and Regulatory Certainty	Affordable Spectrum Prices	Well-planned Assignment Processes	Carefully Considered Obligations
<ul style="list-style-type: none">▪ License duration of more than 20 years▪ Establish a license-renewal process:<ul style="list-style-type: none">▪ Presumption of Renewal▪ 3-4 years in advance▪ No new T&Cs	<ul style="list-style-type: none">▪ Set fair prices▪ Use annual fees to recoup costs – not maximise revenues▪ Renewal process should not be costly▪ High prices impact investment:  <p>NETWORK QUALITY NETWORK COVERAGE CONSUMER PRICES</p>	<ul style="list-style-type: none">▪ Auctions are common methodology, but are not the only solution▪ Make spectrum available as soon as practical▪ Avoid any type of artificial scarcity▪ Have an open conversation with the industry	<ul style="list-style-type: none">▪ No service and technology restrictions▪ Use coverage obligations with caution and target them to actual needs▪ Discount obligations from reserve prices

Regulatory Perspective

Panamá

Armando Fuentes Rodríguez
Administrador General
ASEP



EL ESPECTRO: la autopista invisible para la revolución digital



5G



**MWC Barcelona
2023**
27 FEBRUARY – 2 MARCH,
2023

MESA REDONDA

POLITICA DE ESPECTRO COMO PILAR DEL CIERRE DE LA BRECHA DIGITAL

Poner a disposición de los operadores móviles espectro radioeléctrico adicional.

Facilitar a los operadores móviles la implementación de soluciones que permitan atender la creciente asimetría del tráfico de datos.

Promover normativas y reglamentaciones técnico-regulatorias que coadyuven en el acceso de la población a la banda ancha.

Propiciar las condiciones para el desarrollo de la infraestructura de telecomunicaciones a nivel nacional.



EVOLUCIÓN: VALOR DEL ESPECTRO PARA EL SERVICIO MÓVIL CELULAR

Banda: 850 MHz

Precio base por MHz: US\$ 2,9 MM

1997

Asignación de Espectro en la Banda de 700 MHz

Precio estimado ≈ \$3.2 MM/MHz

2008

2014–2015

Asignación de espectro (AWS, 700 y 1900), sin costo, por incrementos del tráfico de red por Pandemia.

Medida Temporal de Abril 2020 Abril 2022

2017

2020

Licitación PCS

Precio Ref. \$1.91 MM/MHz
Precio Pagado: \$2.87 MM/MHz

Operadores muestran Interés por AWS pero indican que el precios es oneroso

Precio estimado ≈ \$3.4 MM/MHz

2022

Precio Ref. \$3.6 MM/MHz
Precio Pagado: \$1.2 MM/MHz

Reducción del precio del espectro AWS en un **64%**



BENEFICIOS SOCIALES

La reducción del precio del espectro en un 64%, revela un acertado **conocimiento del rol estratégico** del Regulador en la gestión de este recurso.

La suma de 120 MHz (AWS) al total de espectro disponibles para los operadores móviles **permitirá la expansión de sus redes** lo que impactará directamente en la mejora de la cobertura y la calidad del servicio.

La reducción en el precio del espectro ha incentivado a los operadores de telefonía móvil a invertir en la expansión de sus redes, **impactando sus costos de operación**.

El acceso de los operadores al espectro correcto, en el momento adecuado y a precios y condiciones razonables, es **fundamental para expandir y mejorar los servicios de banda ancha móvil**.

La disponibilidad de espectro se convierte en una herramienta de inclusión tecnológica que permite reducir la brecha digital, llevando conocimiento y nuevas tecnologías de información a zonas de difícil acceso.



REPÚBLICA DE PANAMÁ

GOBIERNO NACIONAL



Dr. Armando Alonso Fuentes Rodríguez
Administrador general de la Autoridad
Nacional de los Servicios Públicos (ASEP)
Email: arfuentes@asep.gob.pa

Germany

Stefan Schnorr
State Secretary
Federal Ministry for Digital and Transport



New developments: Spectrum impact on QoS

Ian Fogg
VP Analysis
Opensignal

Ilaria Bencivenga
Policy Manager
Opensignal





OPENSIGNAL

How Spectrum Affects Global Mobile Network Experience

February 2023

Ian Fogg, VP Analysis, @ianfogg42, ianfogg@mastodon.social
Ceri Howes, VP Government and External Affairs

How Spectrum Affects Global Mobile Network Experience

- Goals

- Investigate how the amount of spectrum relates to the quality of mobile users' experience
- Provide quantitative evidence to support discussions around:
 - Spectrum licensing
 - Coverage obligation terms
 - Debates with other spectrum users on allocation of spectrum for mobile usage, e.g. 6G, TV, WiFi for example in the run up to WRC

- Approach

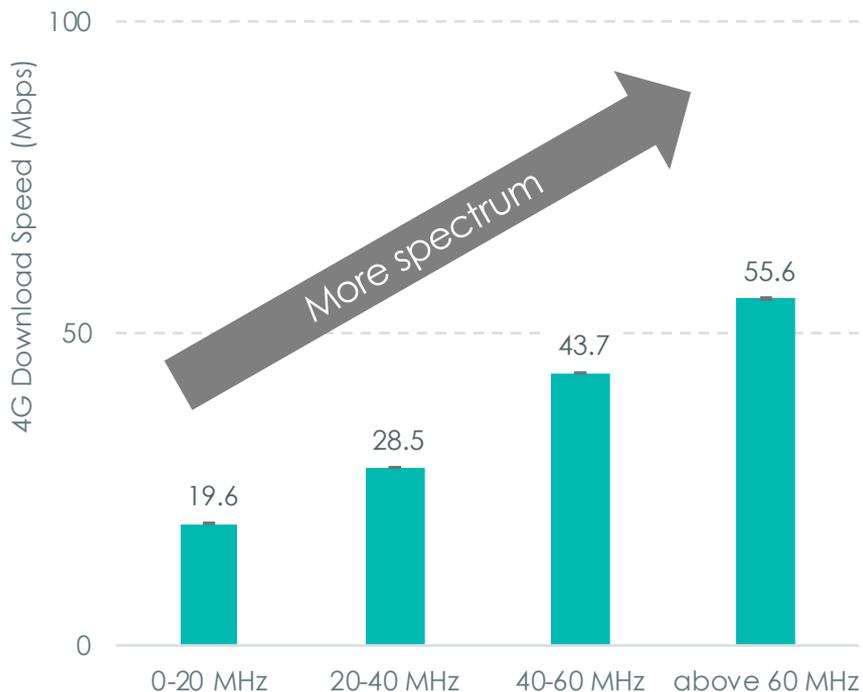
- Analyze >115 international countries/markets and approximately 300 operators
- Means results are relevant globally
- Investigate various experiences, e.g. Video Experience, Games Experience, Download & Upload Speed
- Enables analysis how markets differ based on various segmentations

- Initial Findings

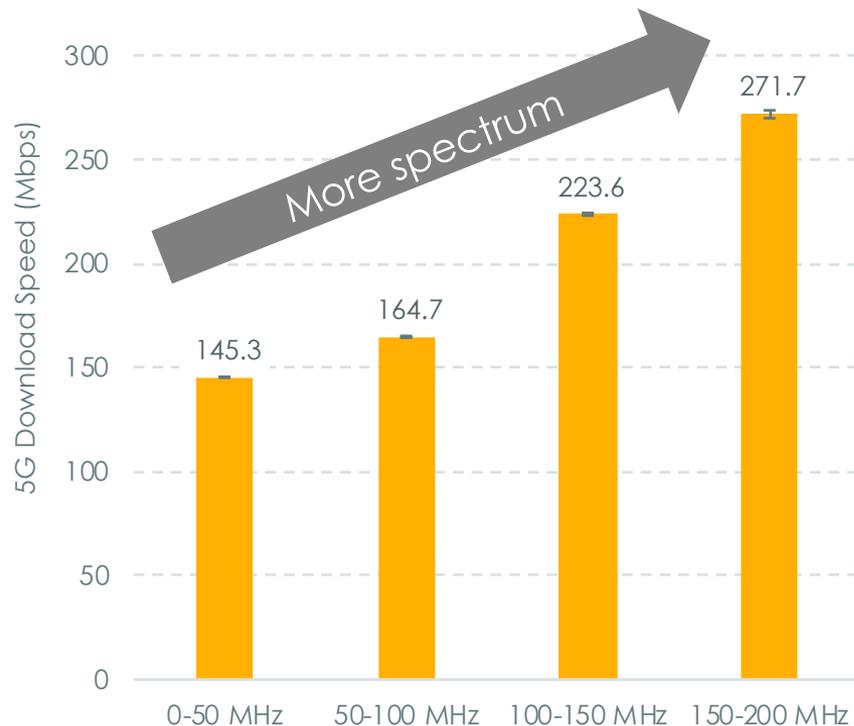
- Globally we observed faster 4G and 5G download speeds with wider spectrum bandwidths dedicated to connections
- At this relatively early stage of 5G deployment, the correlation between bandwidth used and average speeds is stronger for 4G ($R^2 = 0.37$) than for 5G ($R^2 = 0.19$)
- 5G Download speeds across regions rise with more bandwidth
- Video Experience — we see affects of spectrum capacity for mobile video streaming, a key drive of mobile data usage for users worldwide.
- Games Experience — also see an impact, even though multiplayer gaming is based on reliable fast transmission of small packets of data.
- Conclusion: greater spectrum availability improves many aspects of the mobile experience.

Globally, more spectrum capacity boosts users' average speeds

4G: Average Download Speed vs Spectrum Capacity

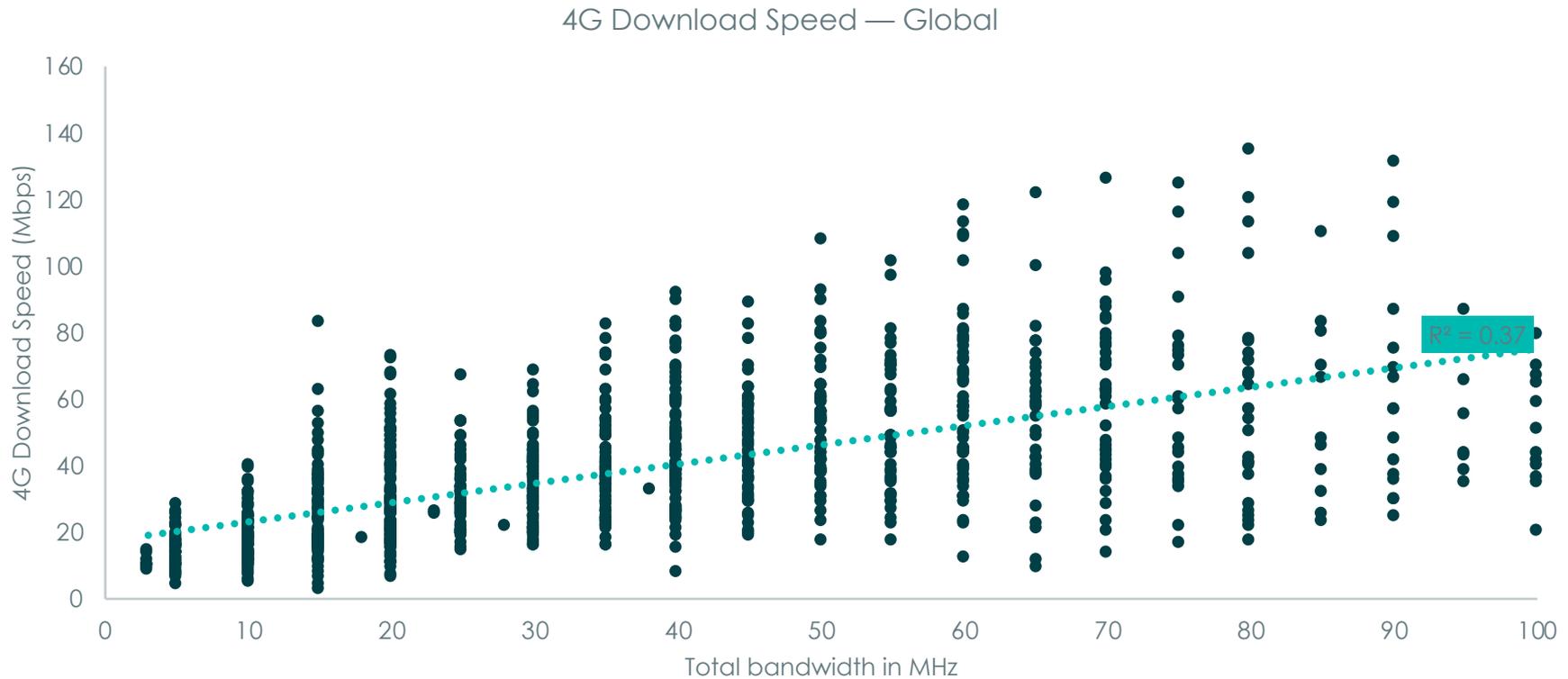


5G: Average Download Speed vs Spectrum Capacity



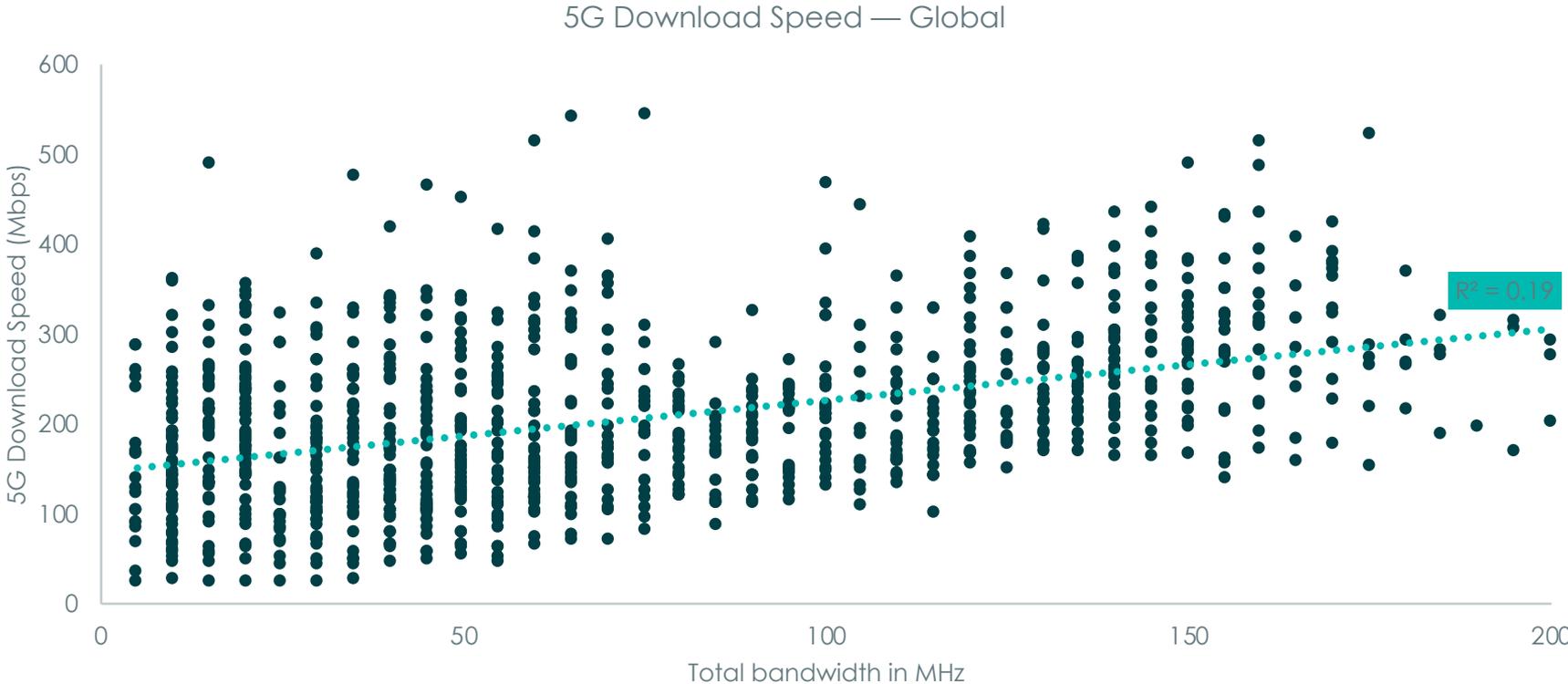
Data collection period: 1 November – 29 January 2023

The study details results in over 115 markets globally



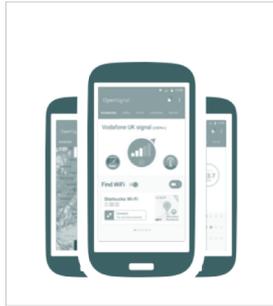
Data collection period: 1 November – 29 January 2023

Even with the early 5G market, the trend continues



Data collection period: 1 November – 29 January 2023

Opensignal approach quantifies the real-world experience



Capturing on-device
mobile experience



Analysing billions of
records to reveal true
experience



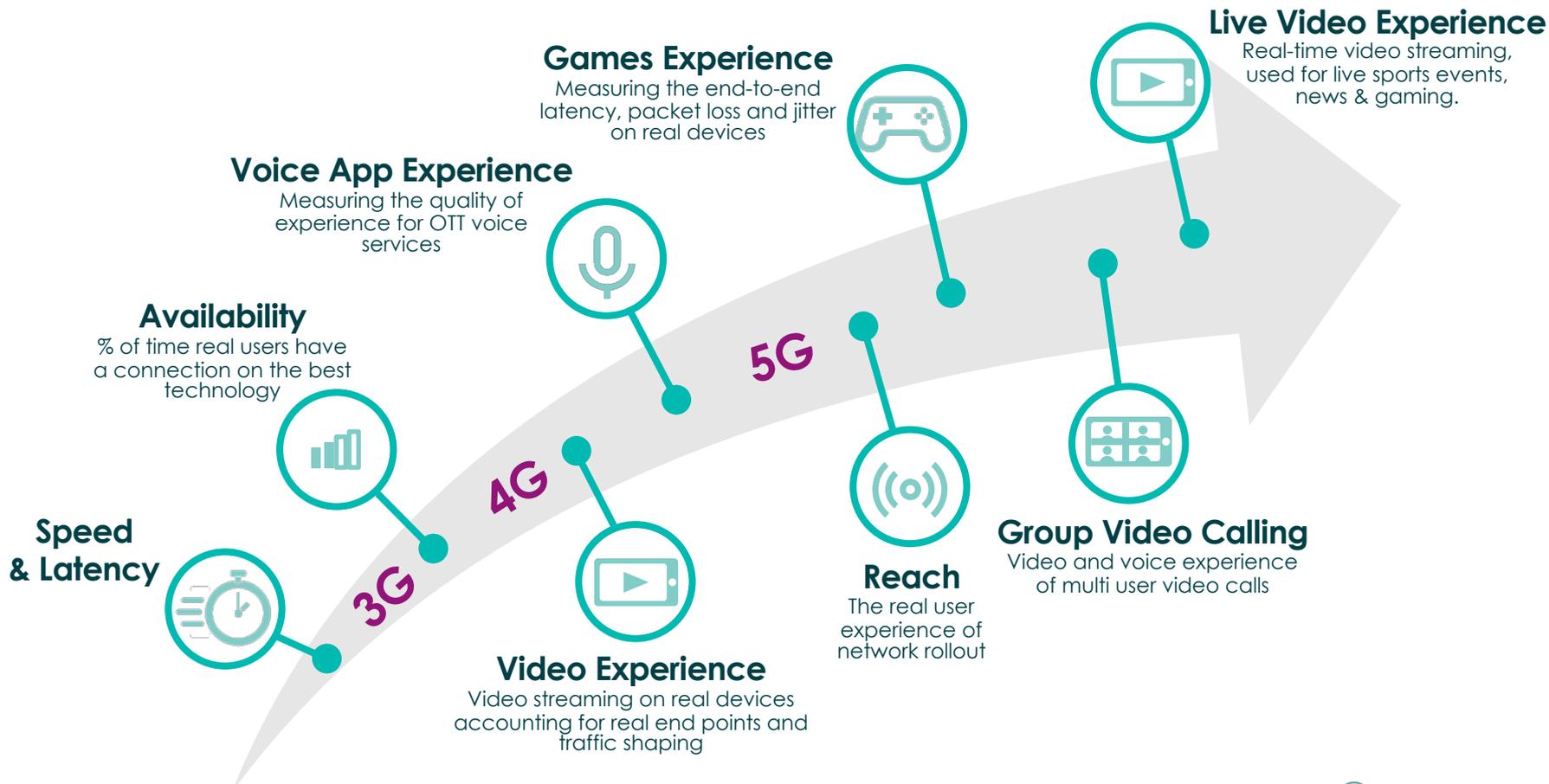
Delivering business
intelligence for
competitive advantage

End to end experience
measurements
Representative sample

Innovative Data Science
and Analytics

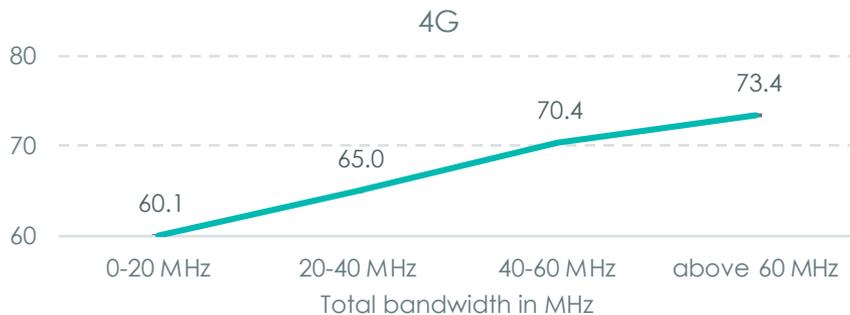
Impartial respected reports
Insights into real
experience

Leading experiential metrics - from network performance to experience

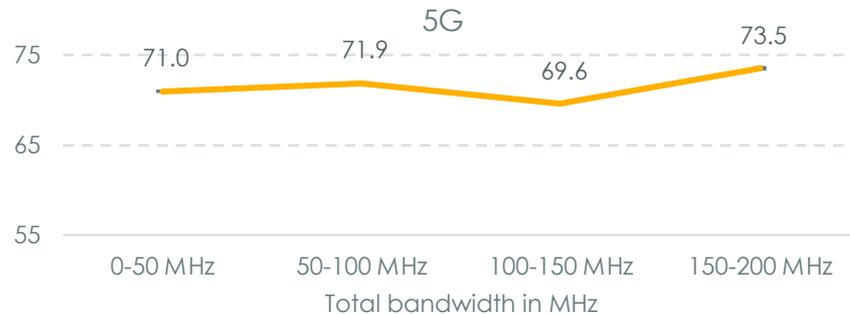
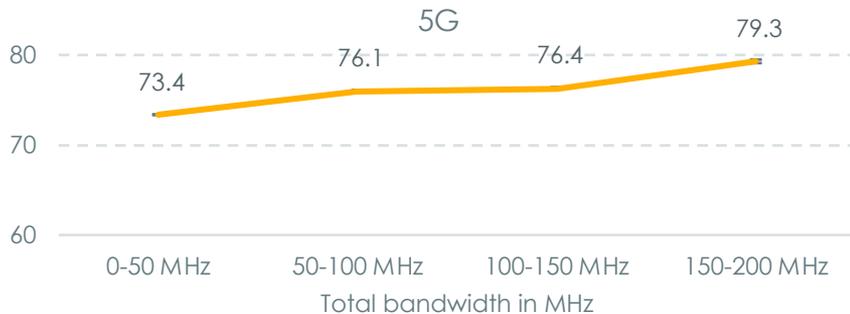
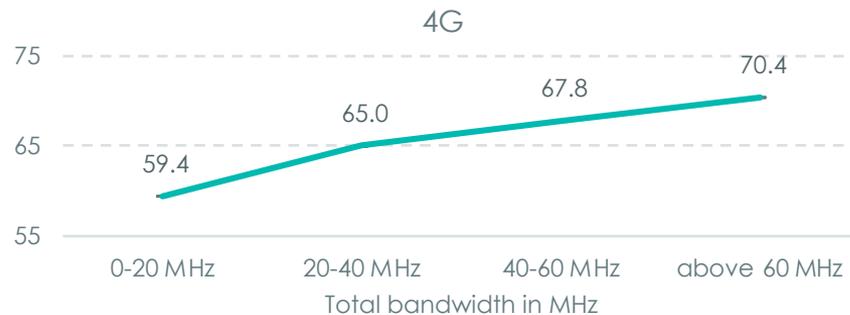


More spectrum capacity also correlates with users' improved multiplayer gaming & video streaming experience globally

Games Experience

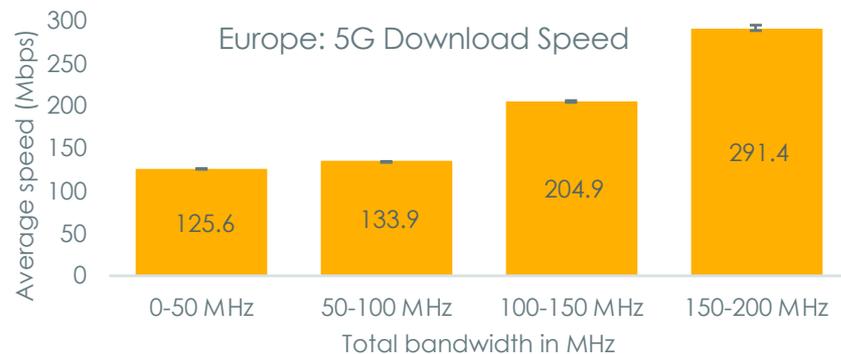
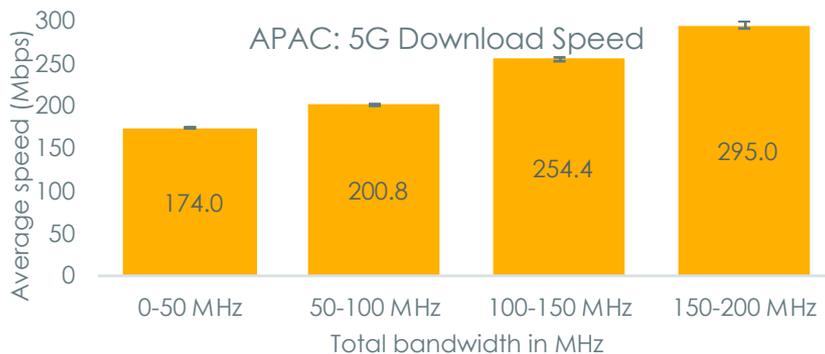
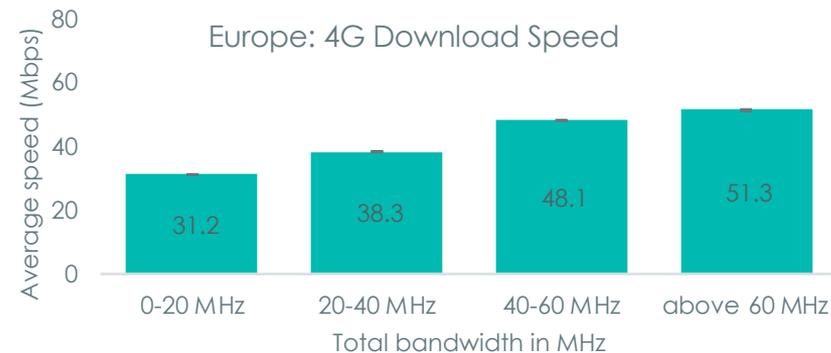
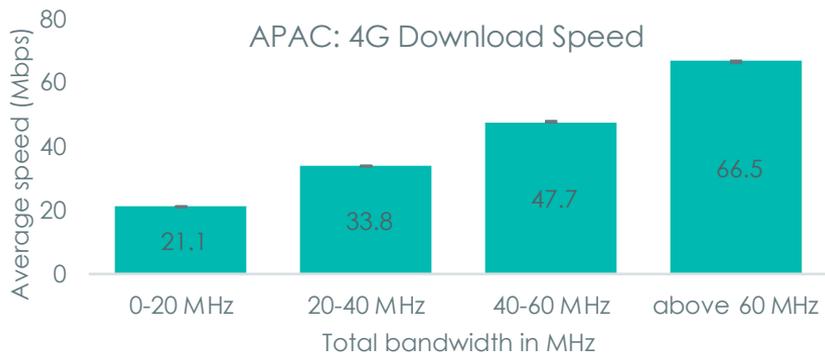


Video Experience



Data collection period: 1 November – 29 January 2023

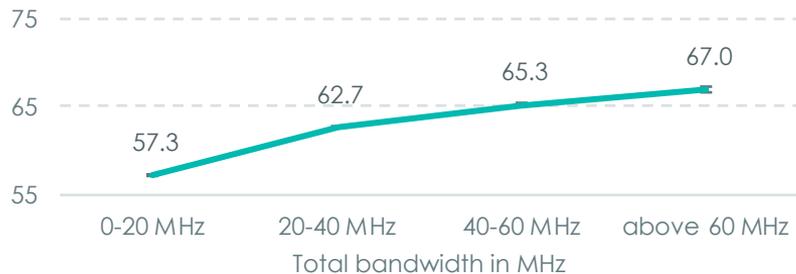
Regionally too, spectrum correlates with average download speed



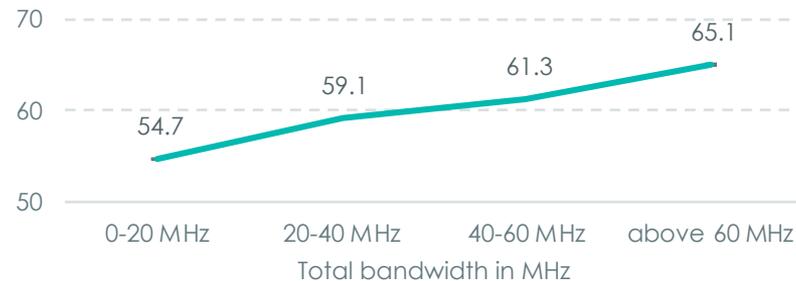
Data collection period: 1 November – 29 January 2023

In less mature 5G regions we see a trend with 4G, but not yet on 5G

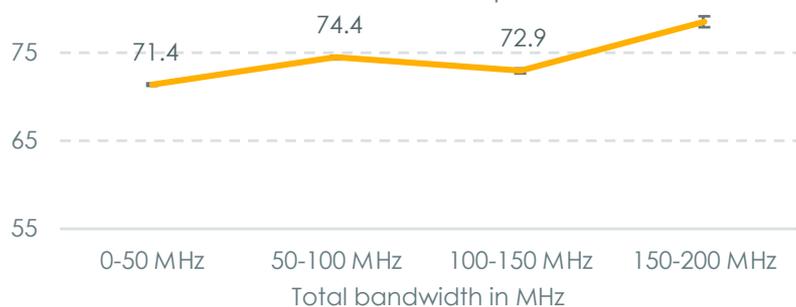
LATAM: 4G Games Experience



North America: 4G Video Experience



LATAM: 5G Games Experience



North America: 5G Video Experience



Data collection period: 1 November – 29 January 2023

How Spectrum Affects Global Mobile Network Experience

- Goals

- Investigate how the amount of spectrum relates to the quality of mobile users' experience
- Provide quantitative evidence to support discussions around:
 - Spectrum licensing
 - Coverage obligation terms
 - Debates with other spectrum users on allocation of spectrum for mobile usage, e.g. 6G, TV, WiFi for example in the run up to WRC

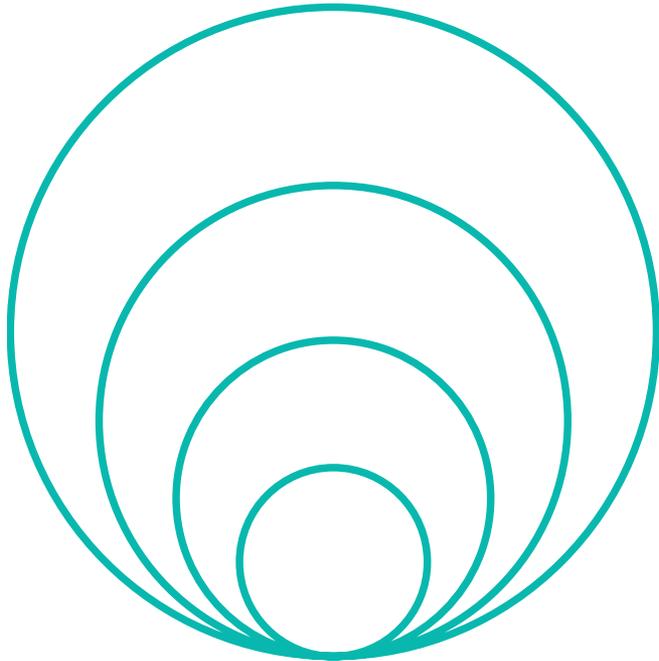
- Approach

- Analyze >115 international countries/markets and approximately 300 operators
- Means results are relevant globally
- Investigate various experiences, e.g. Video Experience, Games Experience, Download & Upload Speed
- Enables analysis how markets differ based on various segmentations

- Initial Findings

- Globally we observed faster 4G and 5G download speeds with wider spectrum bandwidths dedicated to connections
- At this relatively early stage of 5G deployment, the correlation between bandwidth used and average speeds is stronger for 4G ($R^2 = 0.375$) than for 5G ($R^2 = 0.1867$)
- 5G Download speeds across regions rise with more bandwidth
- Video Experience — we see affects of spectrum capacity for mobile video streaming, a key drive of mobile data usage for users worldwide.
- Games Experience — also see an impact, even though multiplayer gaming is based on reliable fast transmission of small packets of data.
- Conclusion: greater spectrum availability improves many aspects of the mobile experience.

Advancing connectivity for all



Improving business performance – commercial and network insights that enable operators to compete and win effectively

Improving network experience – competitive intelligence and actionable insights for operators to improve network experience

Powering sales and marketing – impactful branded assets across full range of sales and marketing channels to grow market share

The independent source of the truth - trusted by stakeholders across the industry to reveal the true end to end network experience

Trusted Independent partner

Independent

Editorially independent public reports - never sponsored

Trusted

Insights trusted by regulators, analysts and over 150 clients globally

Revealing Network Experience

Experiential metrics measuring typical end to end experience

Scientific Analysis

Sophisticated methodology applied consistently

Valued Candid Partner

Global teams with years of industry experience



Openly sharing the standards we uphold for published content

Why does Opensignal work with governments and institutions?

- Providing independent analytics to support evidence-based regulatory approaches and policymaking
- Helping regulators and policymakers manage consumer expectations and proactively engage with industry (vs a compliance model)
- Independence is critical – a trustworthy third-party source of data is powerful in providing a “buffer” from political pressures and ensuring that connectivity policy is impactful on the ground
- Robust methodology – data integrity and the strictest privacy standards are fundamental to our work
- Regional and international comparisons are possible due to globally standardized methodology
- Evolving the regulatory discussion from static QoS compliance to end-to-end, quality of experience approaches.



Statistics Canada



هيئة الاتصالات والفضاء والتقنية
Communications, Space & Technology Commission



2022 government partnerships



Home UK World Business Politics

Ofcom report shows growing 5G coverage

15 December 2022



About seven in 10 UK properties can now get reception from at least one mobile operator, a new report from media regulator Ofcom.

This is up from about half of all UK household months ago, the Connected Nations report says.

The number of mobile phones able to use 5G also risen significantly, doubling in the past year. One in five handsets, the Ofcom report found.

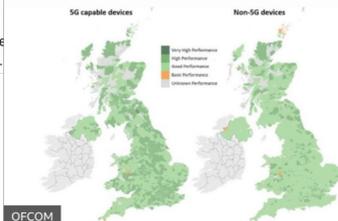
Ofcom analysed crowdsourced data from Opensignal to help judge the quality of service across the UK.

It found for 5G devices many more areas achieve a "high performance" level than for non-5G devices, but found that - even for 5G - few areas met the "highest performance" level.

Ofcom told the BBC it wanted to see investment in 5G networks.

It said "The UK's mobile companies are still in the process of rolling out 5G and are at different stages of extending their networks. So customers' experience will vary by their location and network.

"We'll be taking further steps over the coming year to shine a light on this, so people can see for themselves which operators are leading the way for quality of service."



OFCOM

Combined operator performance comparing 5G and non-5G devices, Ofcom analysis of Opensignal data.

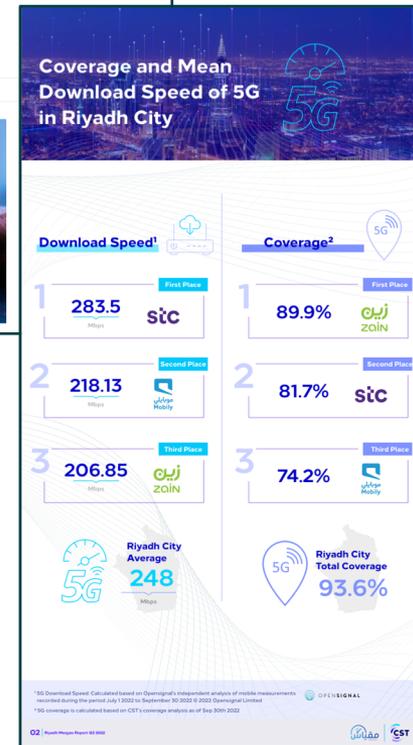


OECD publishing

DEVELOPMENTS IN SPECTRUM MANAGEMENT FOR COMMUNICATION SERVICES

OECD DIGITAL ECONOMY PAPERS

October 2022 No. 332



Thank you

Ian Fogg, VP Analysis
@ianfogg42, ianfogg@mastodon.social
ianfogg@opensignal.com

Ceri Howes, VP Government and External Affairs
cerihowes@opensignal.com

Roundtable

Lucas Gallitto
Head of LATAM
GSMA



Roundtable Discussion

- 1) What are the plans for Spectrum in your market to fulfil the needs of next-generation mobile services?
- 2) How does spectrum pricing sit within the pillars to encourage investments in your market?

Closing Remarks

GSMA | Ministerial
Programme

#MWC23MP