

# MCom






MINISTÉRIO DAS COMUNICAÇÕES





Hermano Tercius

Secretary of Telecommunications













# Country Overview

No.		Country	Area (Km <sup>2</sup> )
1		Russia	17,098,242
2		Canada	9,984,670
3		China	9,706,961
4		United States	9,372,610
5		Brazil	8,515,767

No.		Country	Population
1		<a href="#">India</a>	1,450,935,791
2		<a href="#">China</a>	1,419,321,278
3		<a href="#">United States</a>	345,426,571
4		<a href="#">Indonesia</a>	283,487,931
5		<a href="#">Pakistan</a>	251,269,164
6		<a href="#">Nigeria</a>	232,679,478
7		<a href="#">Brazil</a>	211,998,573

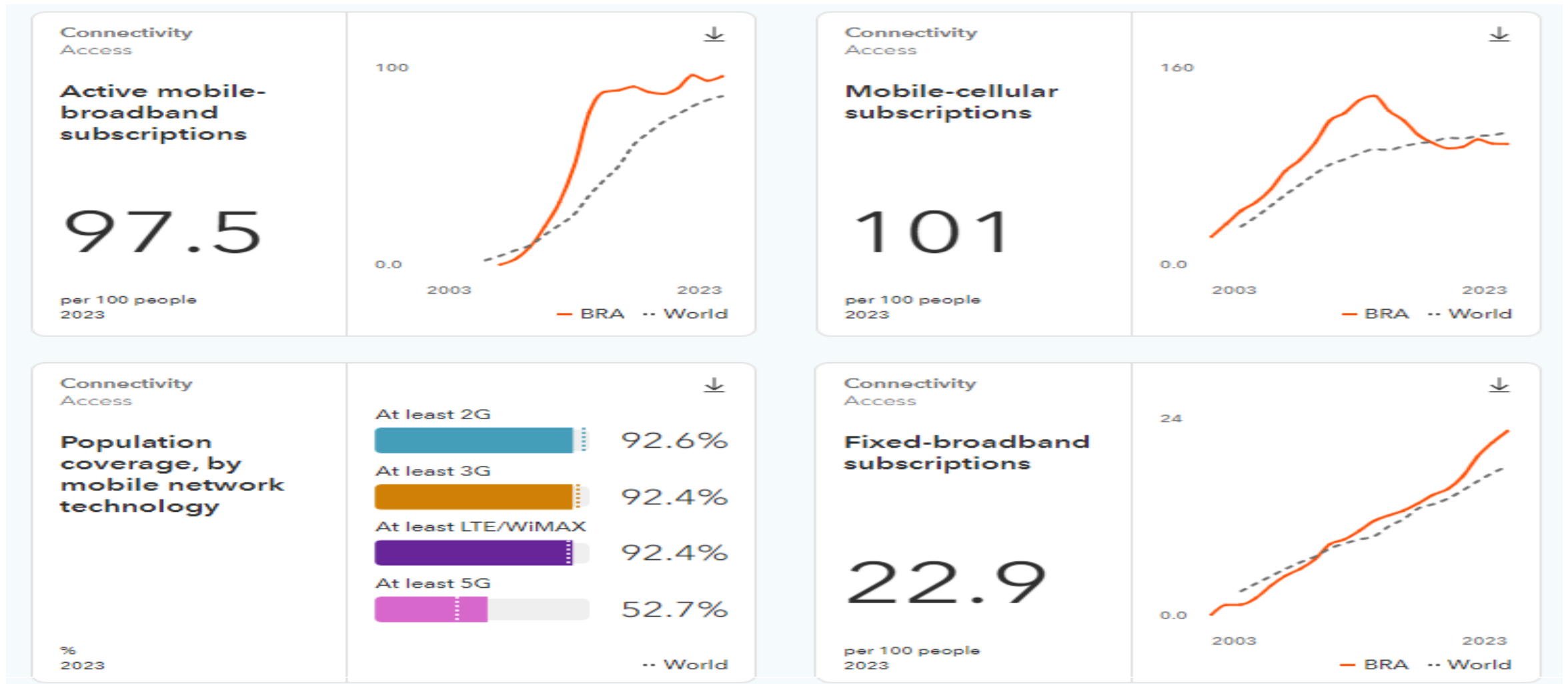


# Brazilian Economy

No.	Country	Continent	GDP (USD Billion)	GDP Per Capita USD thousand)
1 	United States	America	28,783	85.37
2 	China	Asia	18,536	13.14
3 	Germany	Europe	4,590	54.29
4 	Japan	Asia	4,112	33.14
5 	India	Asia	3,942	2.73
6 	United Kingdom	Europe	3,502	51.07
7 	France	Europe	3,132	47.36
8 	Brazil	America	2,333	11.35
9 	Italy	Europe	2,332	39.58
10 	Canada	America	2,242	54.87

Source: <https://cleartax.in/s/world-gdp-ranking-list> (July 2024)

# Brazilian Telecommunication Sector

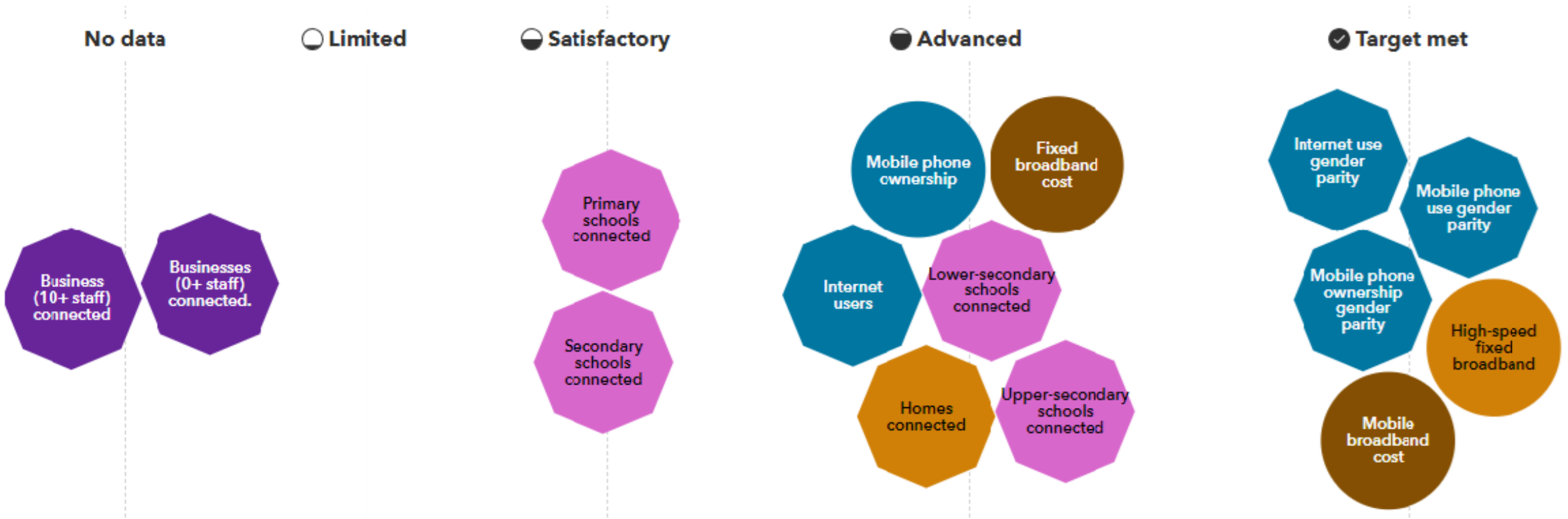


Source: <https://datahub.itu.int/dashboards/?id=2&e=BRA> (2023)

# Universal and Meaningful Connectivity



● People ● Homes ● Businesses ● Affordability ● Schools ● Infrastructure



Source: <https://datahub.itu.int/dashboards/umc/?e=BRA> (2023)

# Penetration of telecommunication services



345.061.876 telecommunication services subscriptions

Fixed broadband

📶 49,6M

Mobile phone

📱 262,4M

Pay TV

📺 10,0M

Fixed phone

☎️ 23,1M

23,3

Density

(per 100 people)

102,0

Density

(per 100 people)

4,7

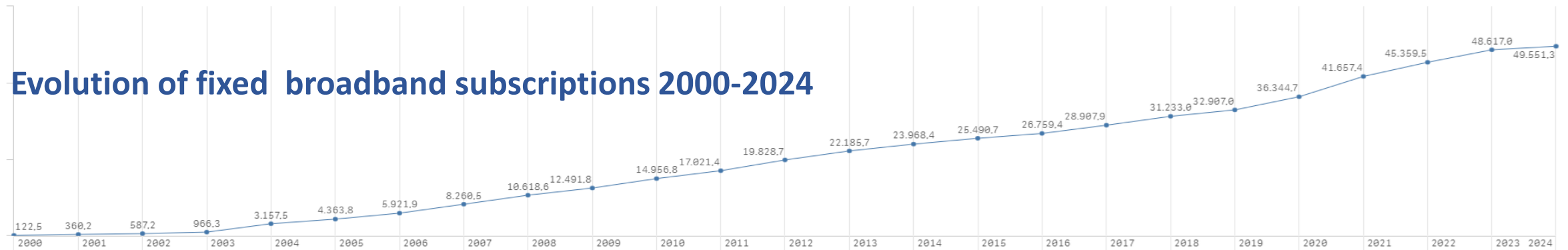
Density

(per 100 people)

10,8

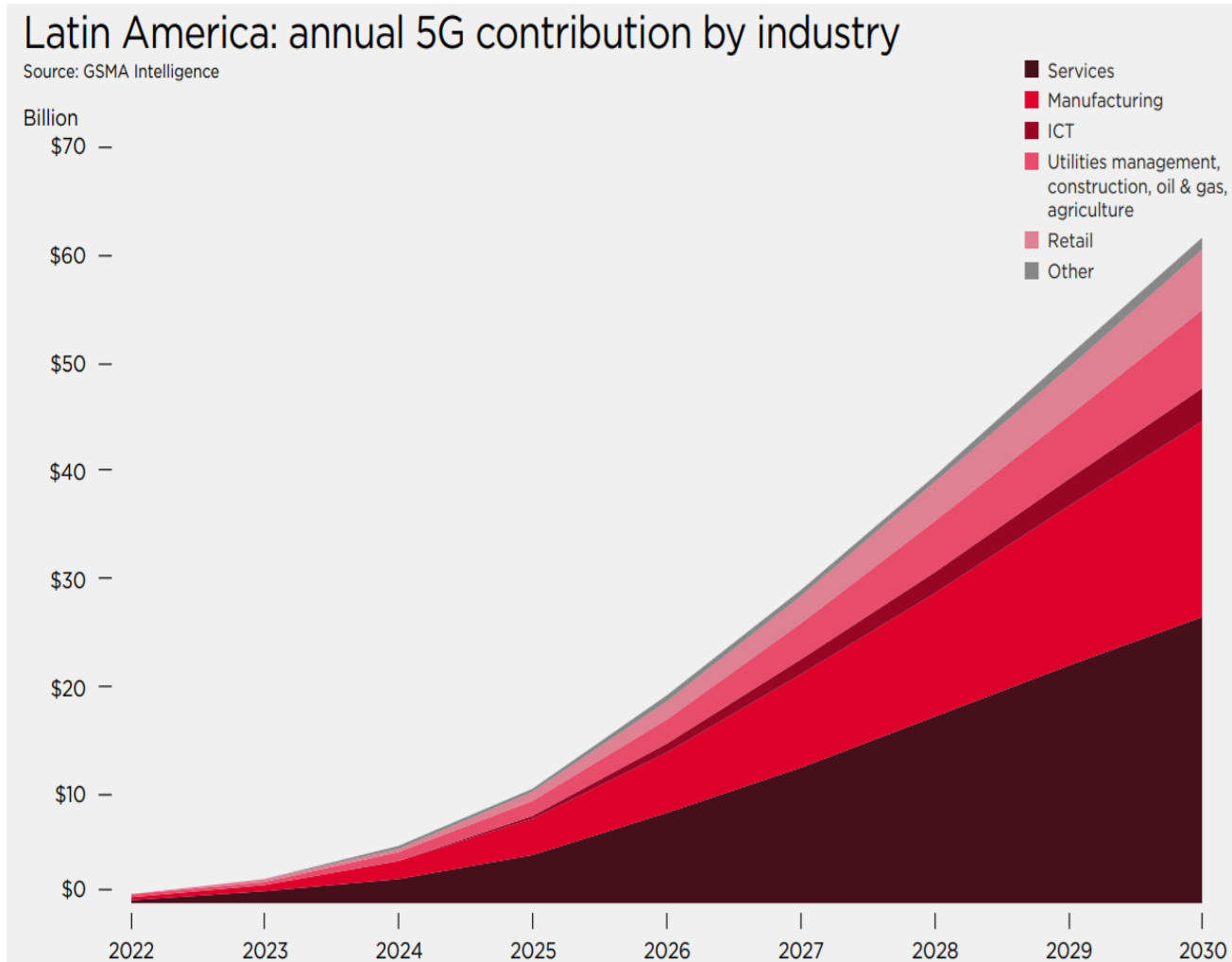
Density

(per 100 people)

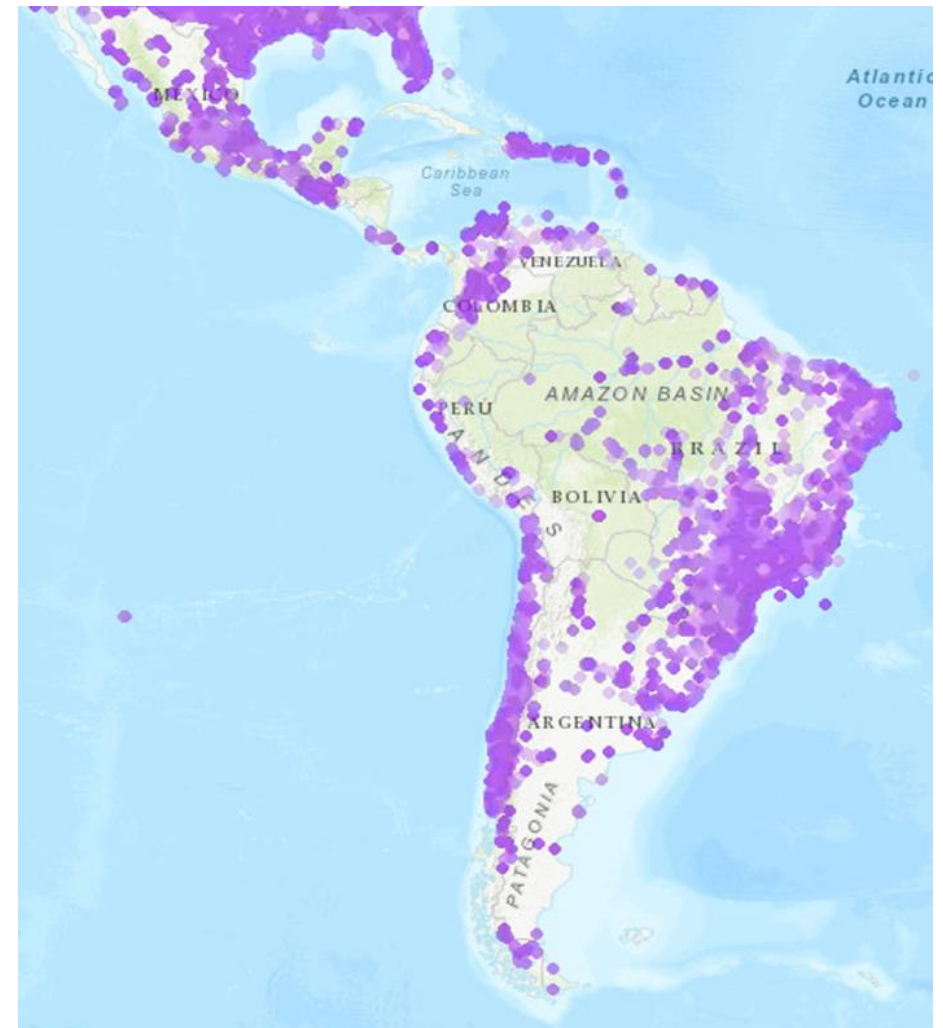


Source: <https://informacoes.anatel.gov.br/paineis/aceessos/panorama> (August 2024)

# Cellular 5G networks in Latin America



Source: <https://www.gsma.com/about-us/regions/latin-america/wp-content/uploads/2023/08/290623-5G-in-Latam-ENG.pdf/5g>

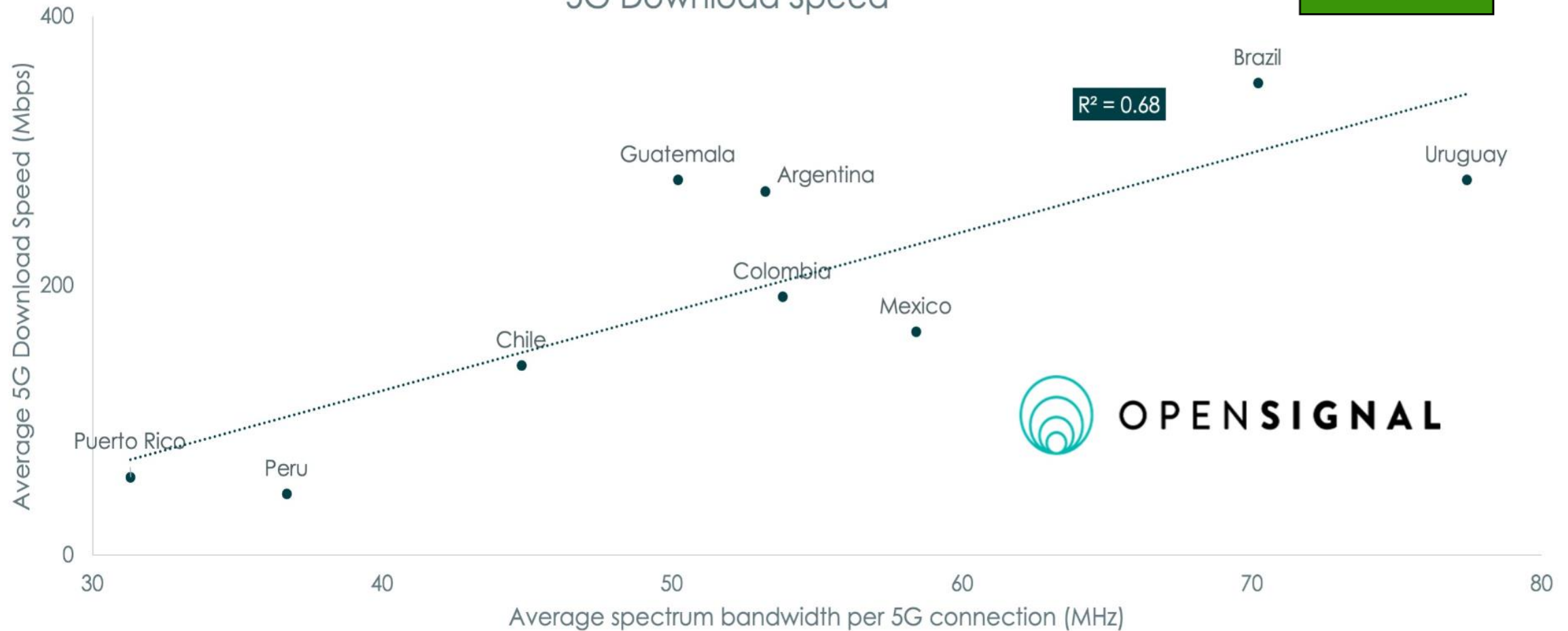


Source: <https://www.nperf.com/en/map/5g> (2024)

# 5G services in Latin America



5G Download Speed



Source: <https://www.opensignal.com/2024/09/19/35ghz-spectrum-the-driving-force-behind-5g-experience-in-latam> (May-July 2024)



# Highlights on Brazilian public policies



New PAC – Growth acceleration program  
Decree nr. 11,632/2023



National Program to Improve Quality and Mobile Broadband Coverage (ConectaBR) - Ordinance MCOM nr. 10,787/2023



Enec – National Connected Schools Strategy  
Decree nr. 11,713/2023



National Pole Sharing Policy  
MCOM/MME Interministerial Ordinance No. 10,563/2023



Research initiative on future mobile networks  
Universities, research institutions, and industry partners.

# The New PAC



The "Novo PAC" (New PAC) is a major investment program launched by the Brazilian government, launched in 2023. The program aims to accelerate economic growth, generate employment, and improve infrastructure across Brazil.

The Novo PAC plans to invest R\$ 1.7 trillion (US\$ 340 billions) in various sectors, including R\$ 371 billion (US\$ 74 billion) from the federal budget, R\$ 343 billion (68 billion) from state-owned companies, R\$ 362 billion (72 billion) from financing, and R\$ 612 billion (120 billion) from the private sector.

The investments will focus on infrastructure projects, social programs, and initiatives to promote sustainable development.

# PAC telecommunications



INCLUSÃO DIGITAL E CONECTIVIDADE

R\$ **27,9** Bi

investimento

R\$ **20,3** Bi

2023 a 2026

R\$ **7,6** Bi

Pós 2026

NOVO **PAC**  
DESENVOLVIMENTO E SUSTENTABILIDADE



CONECTIVIDADE NAS  
ESCOLAS E NAS  
UNIDADES DE SAÚDE



5G  
↓↑  
EXPANSÃO DO 4G E  
IMPLANTAÇÃO DO 5G



INFOVIAS



SERVIÇOS  
POSTAIS



TV DIGITAL

- ❖ 5G deployed in 100% of state capitals and the Federal District
- ❖ Operators are anticipating some obligations of the 5G Auctions Rules:
  - Brazil is one of the top leaders in 5G Standalone (Release 16).
  - More than 314 municipalities with 5G



# 5G Deployment Status in Brazil

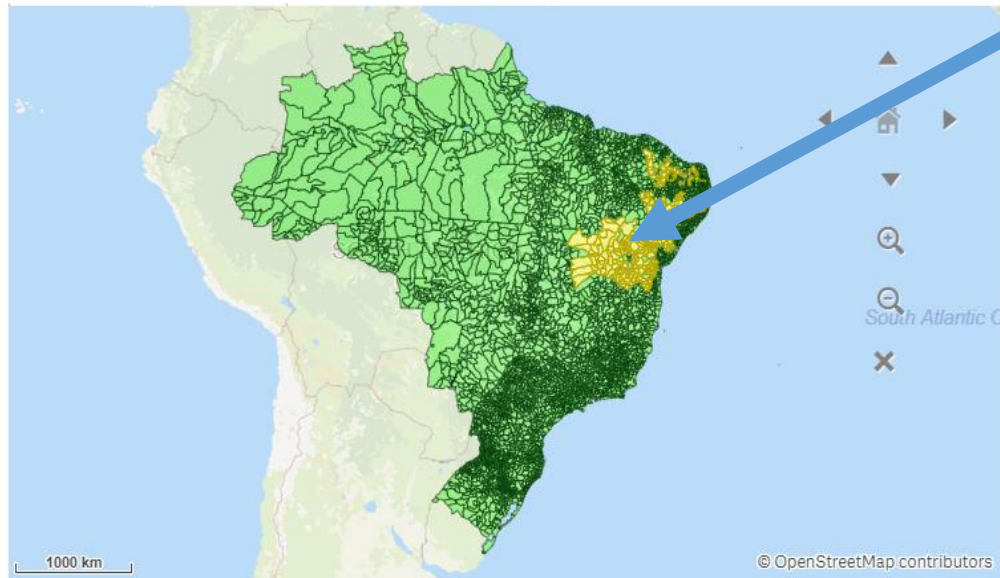
5.570  
Number of  
municipalities

5.191  
Cleared  
for 5G

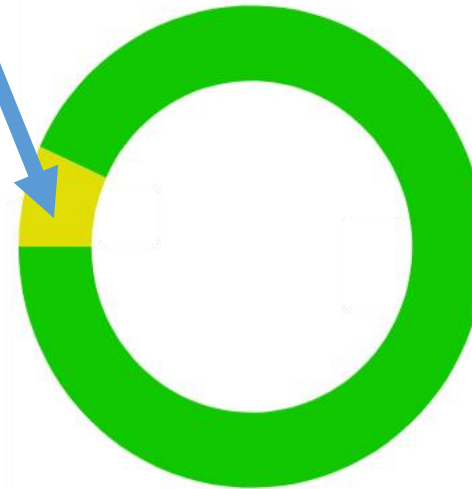
379  
Panned  
for 5G

204,7M  
Population  
cleared

213,3M  
Total  
Population



7%

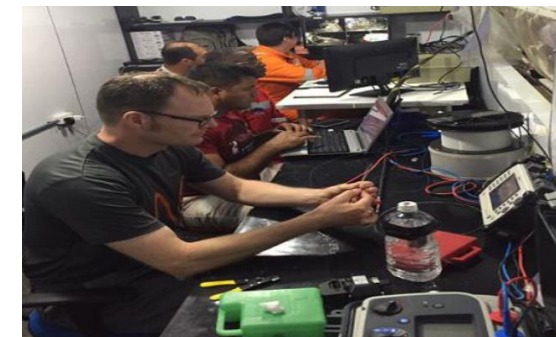


93%  
Cleared  
for 5G

Source: <https://informacoes.anatel.gov.br/paineis/espectro-e-orbita/gaispi-liberacao-e-planejamento-3-5-ghz>

# Connected North

Programa Amazônia Integrada e Sustentável (PAIS)  
Integrated and Sustainable Amazon



**59 municipalities**

Digital Inclusion  
Schools, Hospitals, Homes, Communities

**10 million**

People accessing  
broadband Internet

**12,000 Km**

Subriver optical cable

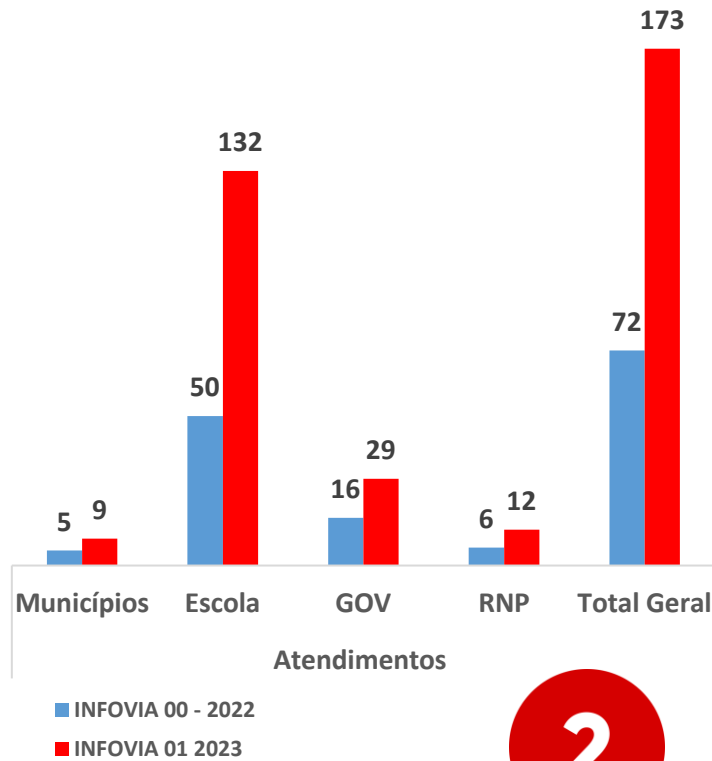


**SDG**

4 Quality Education  
9 Infrastructure  
10 Reduced inequalities  
11 Sustainable cities and communities



# New information pathways



**2**

Tefé → Tabatinga

**13** cities  
**130** schools  
**39** connected places  
(city halls, hospitals, Courts & Army Forces)

**3**

Macapá → Belém

**05** cities  
**50** schools  
**15** connected places  
(city halls, hospitals, Courts & Army Forces)

**4**

Boa Vista → Manaus

**04** cidades  
**40** schools  
**12** connected places  
(city halls, hospitals, Courts & Army Forces)

# Connected Schools

## National Strategy for Connected Schools ENEC



✓ Decree nr. 11,713, 26th September 2023, establishing EneC



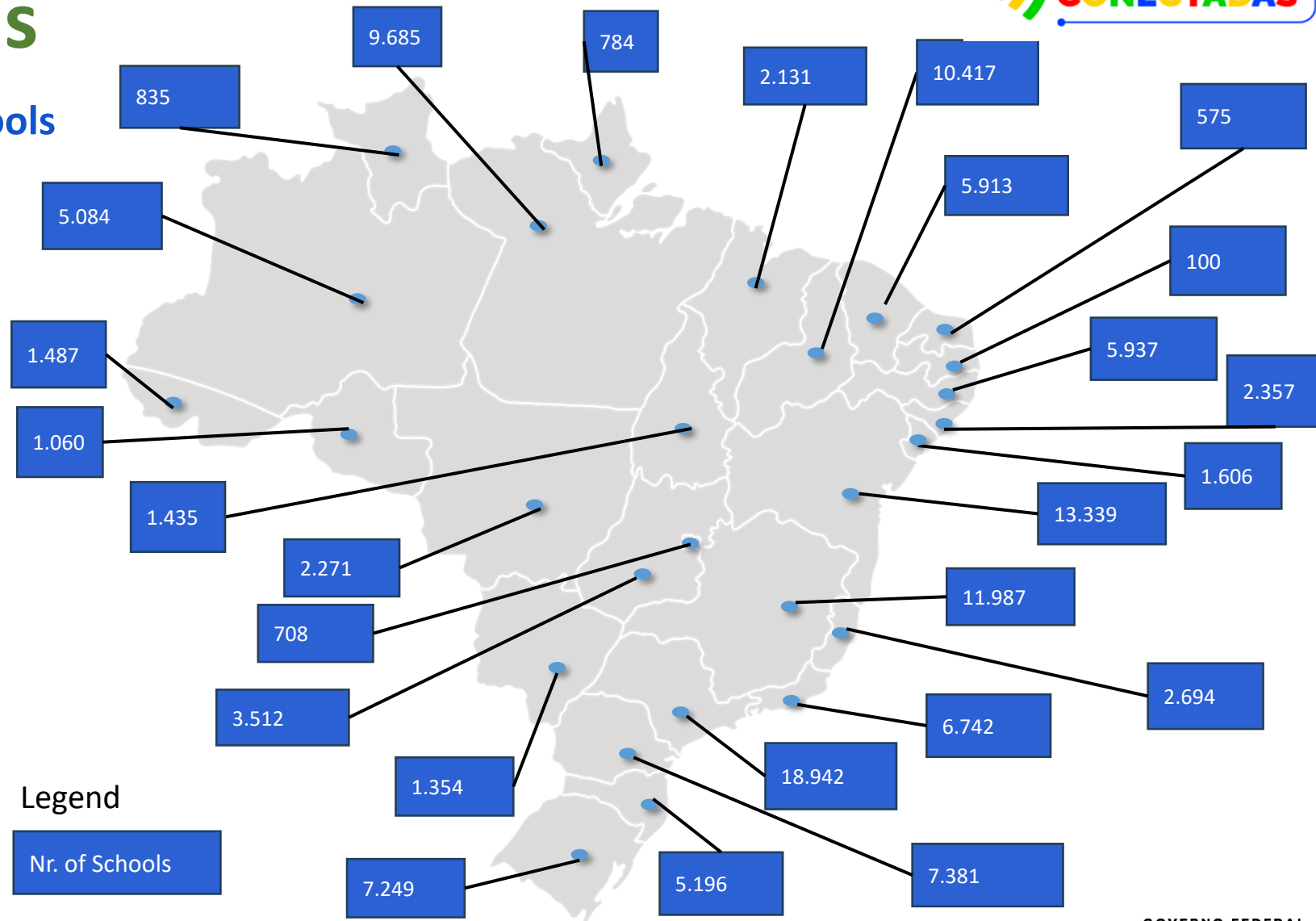
Objective: bring connectivity with **adequate speed and internal network** to the **138,355** schools in the public basic education network by **2026**



Planned investment: R\$8.8 billion



Pilot project **completed**: 175 schools in 5 regions



Reference: Dec/2023

# Mobile Broadband Quality and Coverage (ConectaBR)



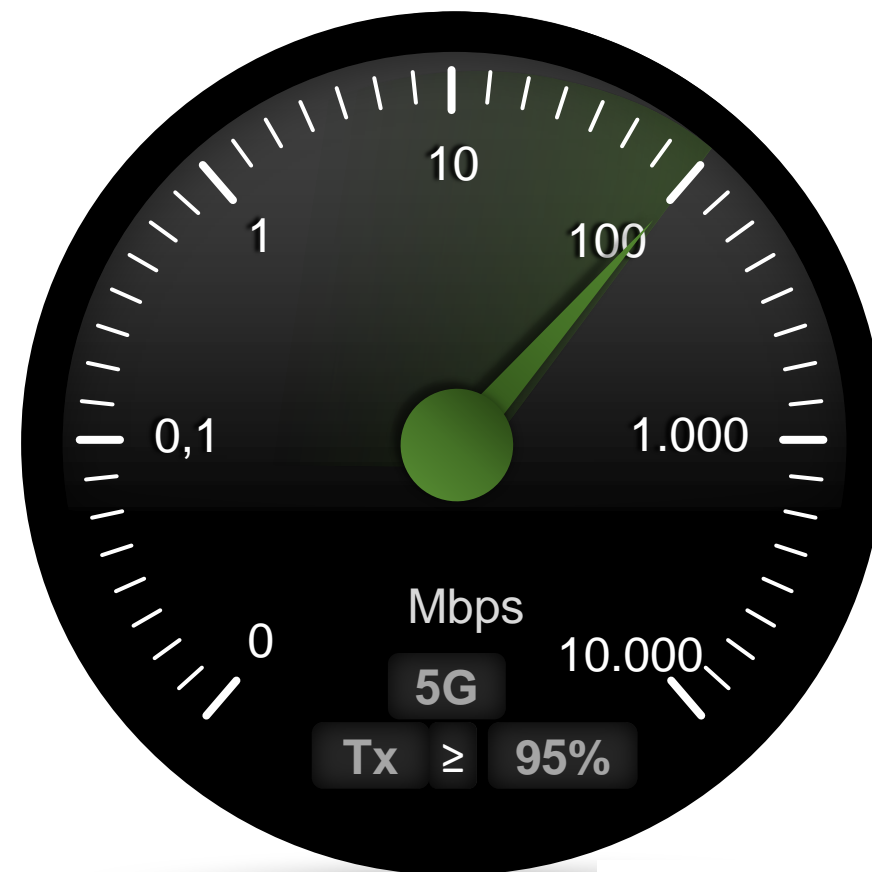
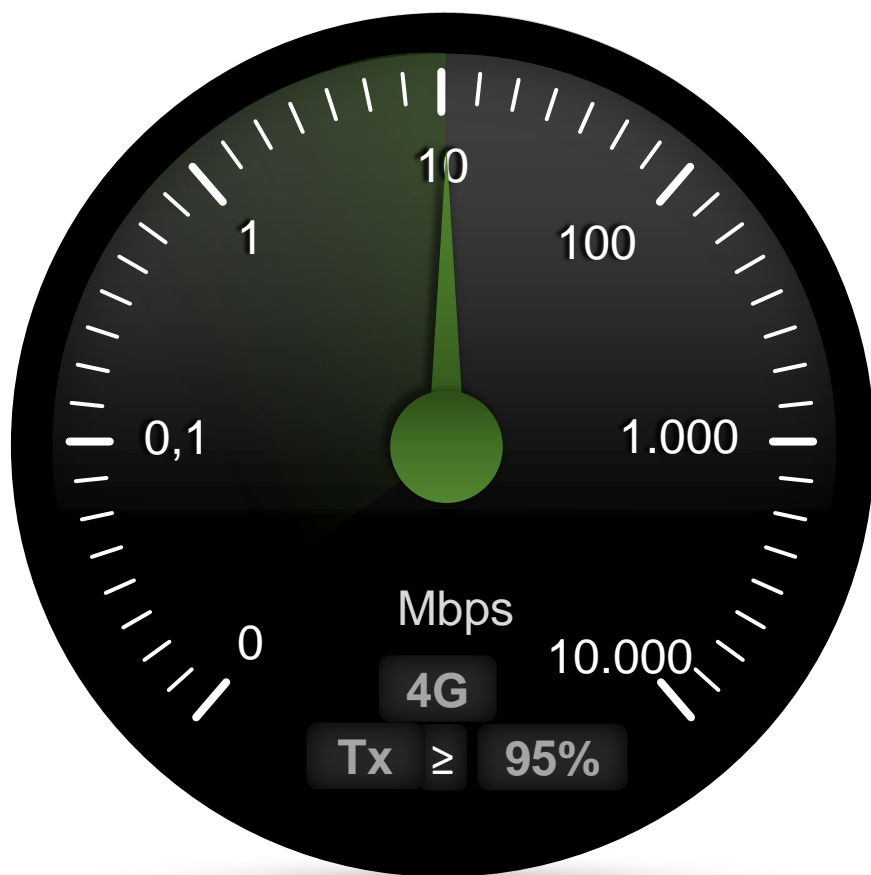
<https://oglobo.globo.com/epoca/o-impacto-do-celular-em-aldeias-indigenas-23408432>

<https://portal6.com.br/2022/06/08/5g-impuro-falha-em-superar-4g-em-teste/>

<https://olhardigital.com.br/2019/07/03/noticias/g-no-mundo-testes-de-velocidade-foram-feitos-em-11-cidades/>

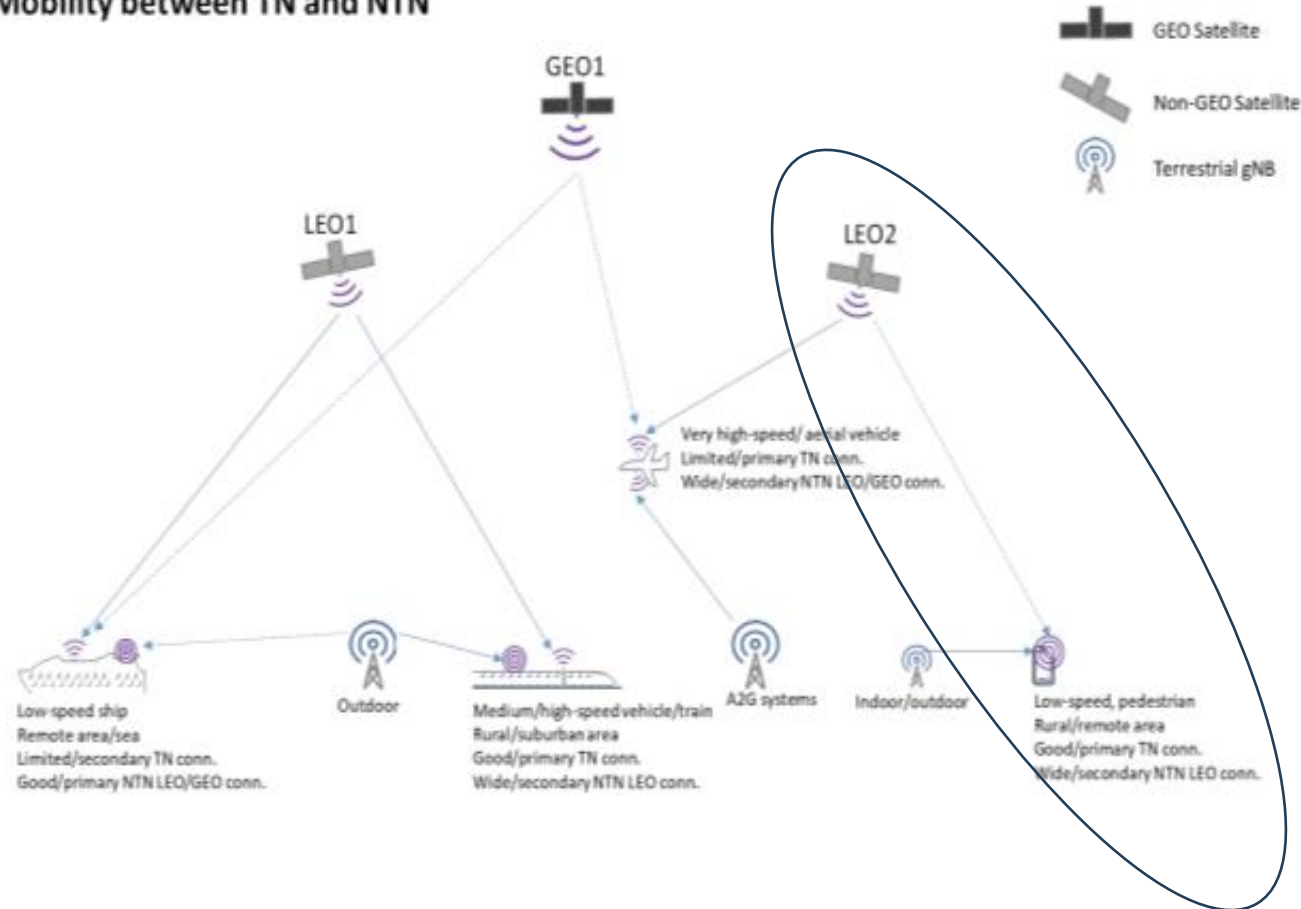


# National Program to Improve Quality and Mobile Broadband Coverage - "ConectaBR"



# National Program to Improve Quality and Mobile Broadband Coverage - "ConectaBR"

Mobility between TN and NTN



# National Pole Sharing Policy – “Poste Legal”



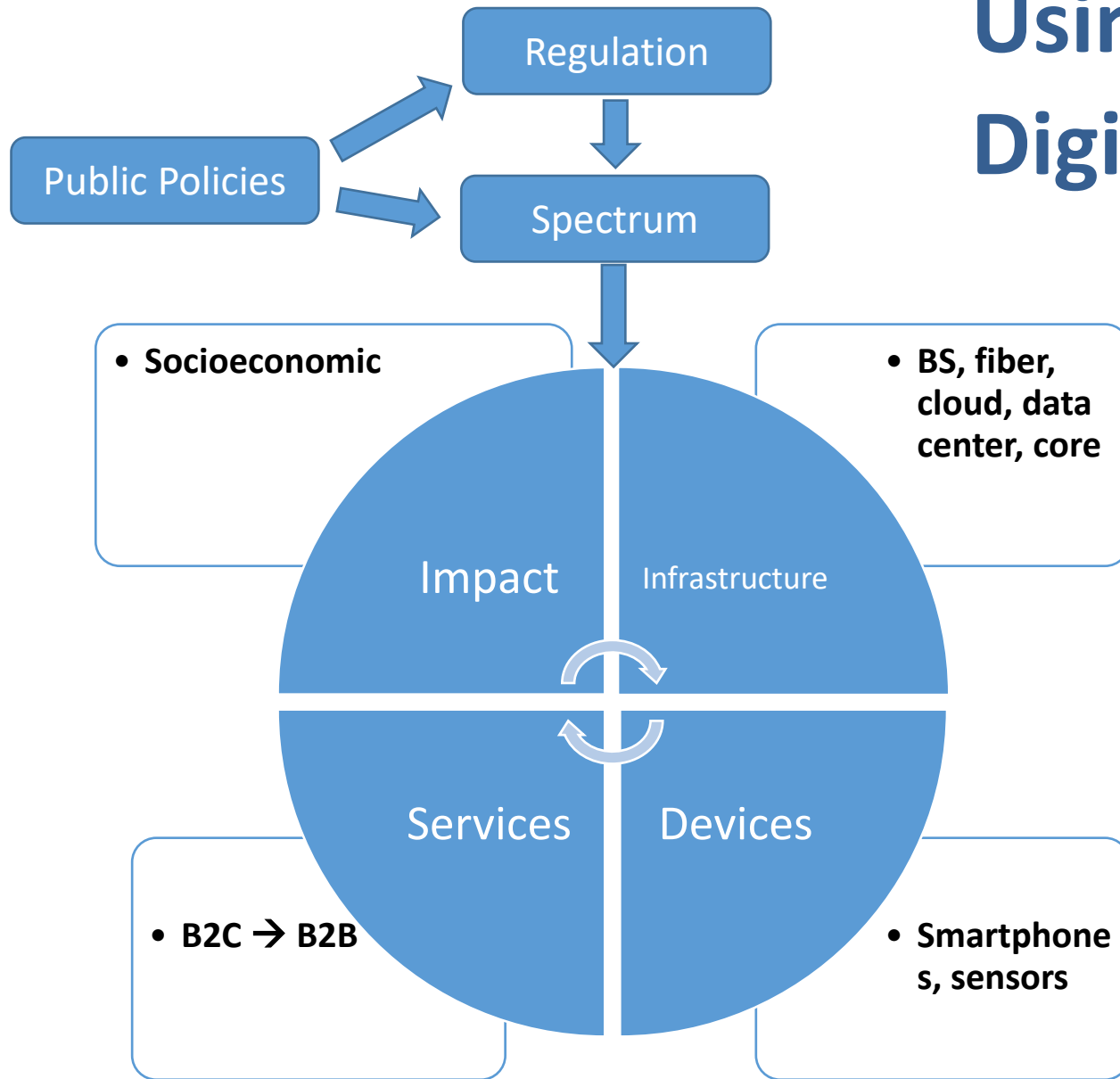
Urgent need to organize the occupation of poles

Users of telecommunications services and consumers of electricity are the same people:  
focus on **citizens**

The value for occupying a fixing point must be based on costs, avoiding intersectoral subsidies

Possibility of specific conditions to encourage digital inclusion in remote and rural areas

# Using 5G and Beyond for Digital Transformation



❖ We are living a digital transformation in Brazil!

# Economic impact in many verticals

Port



Refinery



Manufacturing



Construction



Mining



Logistics



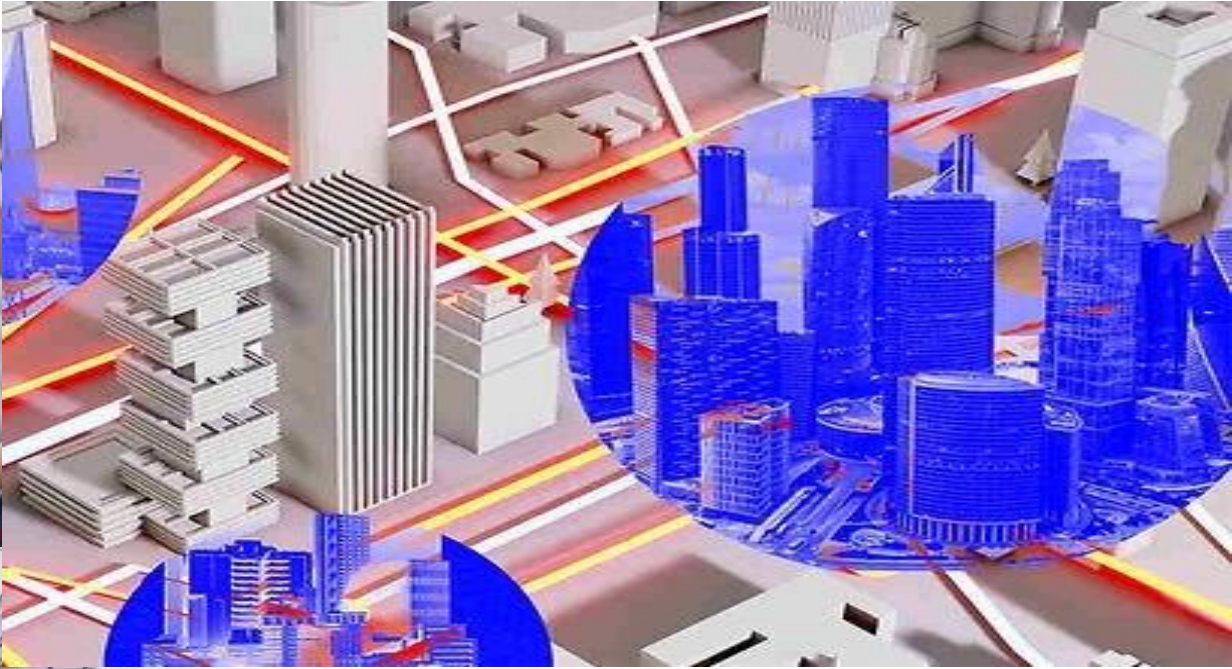
Energy



Oil & Gas



# Essential sectors already benefiting from technology



# Roadmap to 6G

Research for the foundation and design of 6G networks

Rel-21+

3GPP 6G Workshop

Rel-20

6G

5G  
ADVANCED

Rel-20

Rel-19

Rel-18

5G

Rel-17

Rel-16

Rel-15

WRC-19

WRC-23

WRC-27

WRC-31

2018

2019

2020

2021

2022

2023

2024

2025

2026

2027

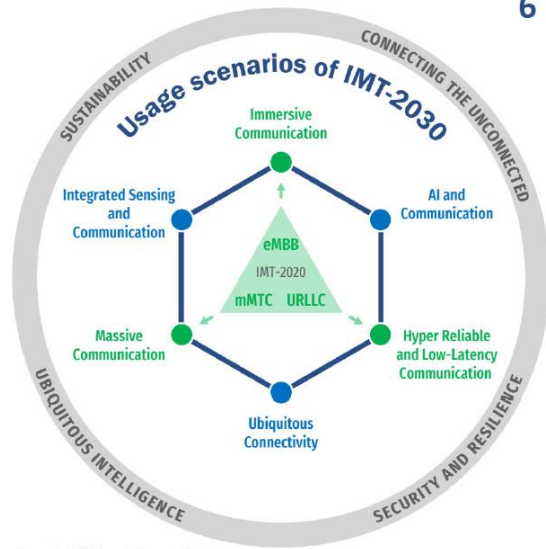
2028

2029

2030+

# 6G: Usage scenarios and capabilities

## Usage scenarios



So called "Wheel diagram"

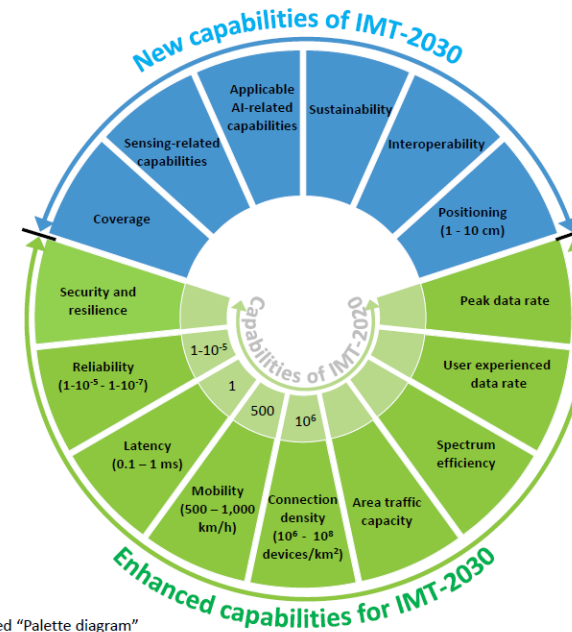
## 6 Usage scenarios

- Extension from IMT-2020 (5G)
  - eMBB → Immersive Communication
  - mMTC → Massive Communication
  - URLLC → HRLLC (Hyper Reliable & Low-Latency Communication)

- New
  - Ubiquitous Connectivity
  - AI and Communication
  - Integrated Sensing and Communication

- 4 Overarching aspects:
  - act as design principles commonly applicable to all usage scenarios
  - Sustainability, Connecting the unconnected, Ubiquitous intelligence, Security/resilience

## Capabilities of IMT-2030



So called "Palette diagram"

The range of values given for capabilities are estimated targets for research and investigation of IMT-2030.

All values in the range have equal priority in research and investigation.

For each usage scenario, a single or multiple values within the range would be developed in future in other ITU-R Recommendations/Reports.

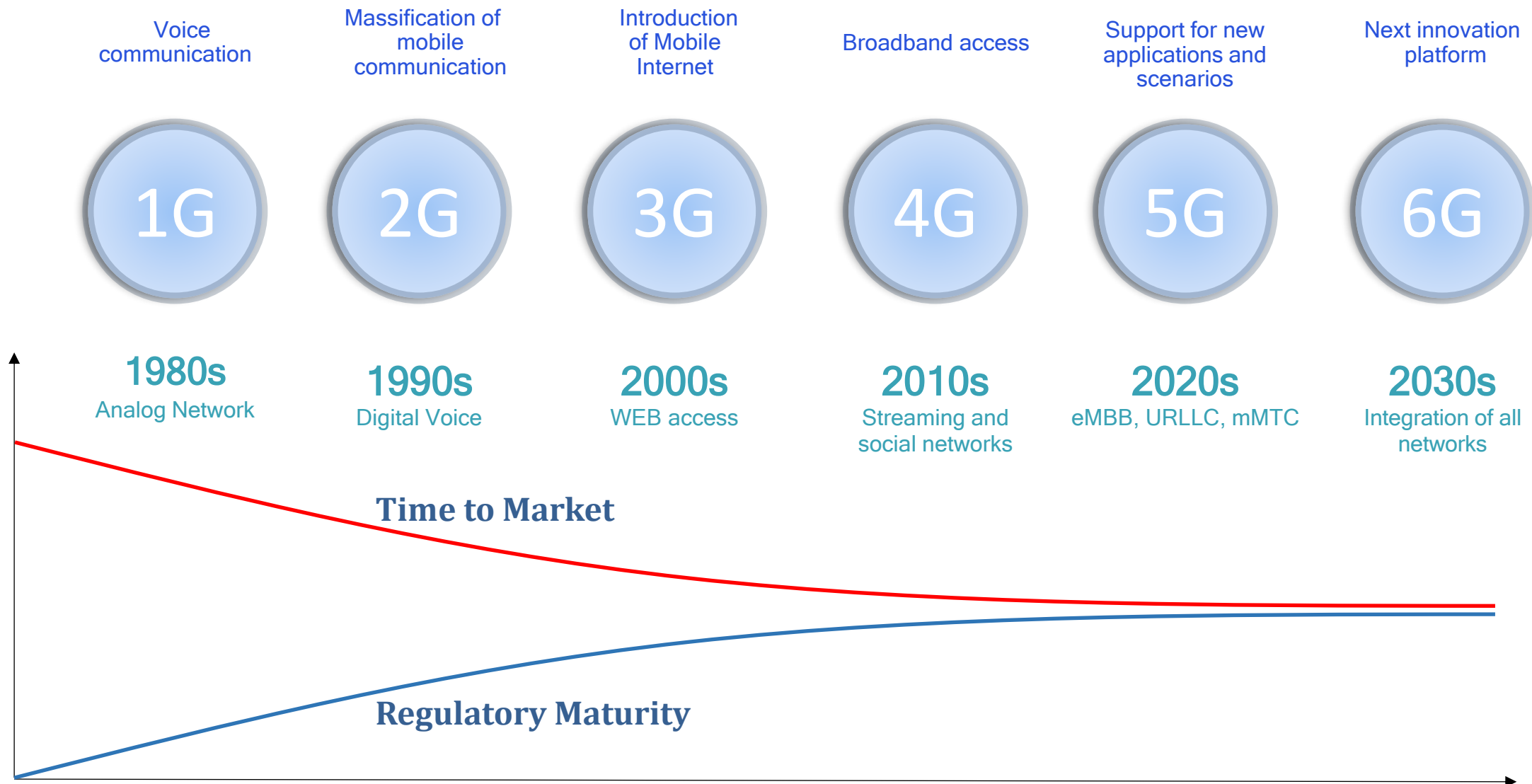
## Recommendation ITU-R M.2160-0 (11/2023)

M Series: Mobile, radiodetermination, amateur and related satellite services

## Framework and overall objectives of the future development of IMT for 2030 and beyond



# Time to market and regulatory maturity



# Brasil 6G Project - Objectives

Long-term scientific research to meet the requirements imposed on 6G networks

Make Brazil an internationally recognized hub for generating knowledge in 6G networks

Coordinate scientific actions between Universities and ICTs, expanding the impact of research in 6G Networks

Create an experimentation environment to implement the proposed contributions under real operating conditions

# International Collaboration

**tsdsi**  
India's Telecom SDO

**5G** IMIF

**5G**  
americas



Global

**5G**

Event

IMT-2020

**6G**

**FLAGSHIP**

**UNIVERSITY  
OF OULU**

Telebra.il  
**5G**  
BRASIL

**6G** SNS  
IA



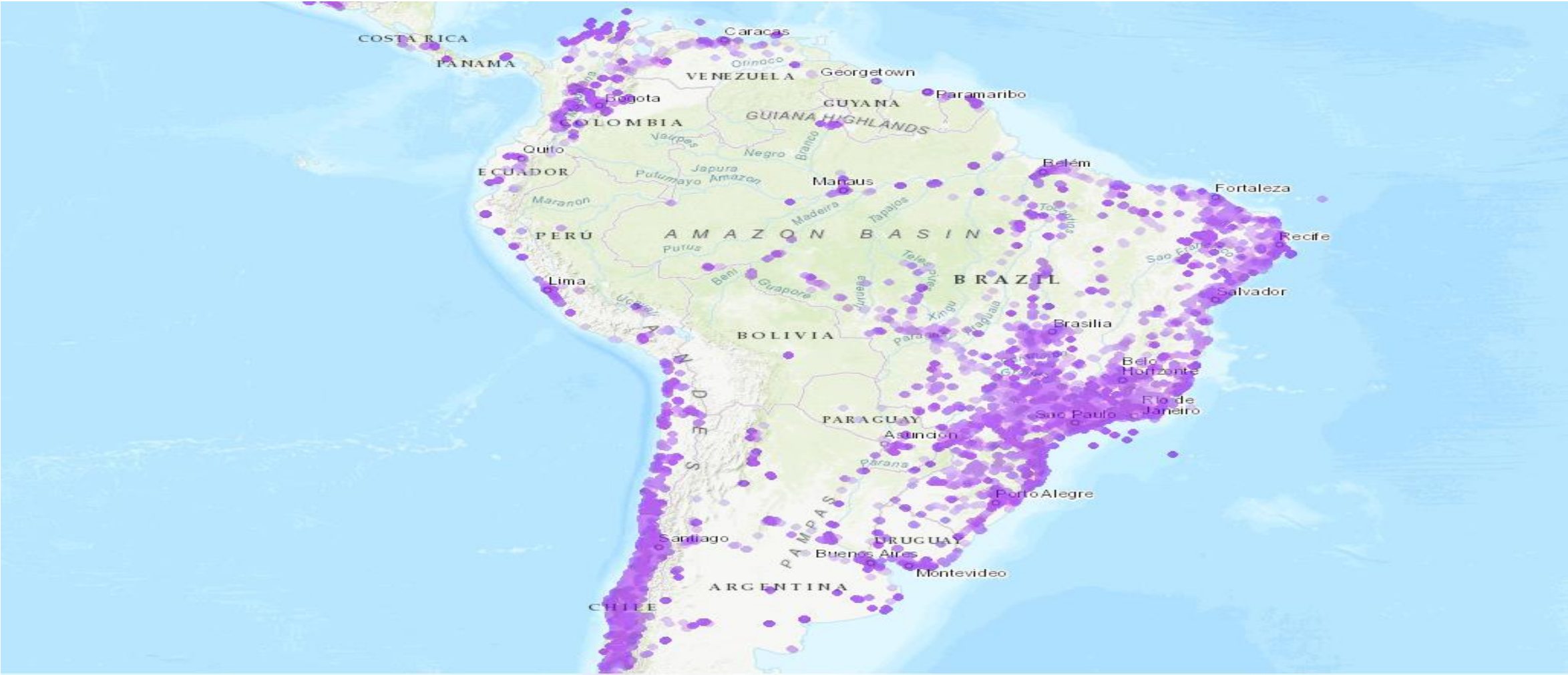
MINISTÉRIO DAS  
COMUNICAÇÕES



gov.br/**mcom**

 min**comunicacoes**

# Cellular 5G networks in South America



Source: <https://www.nperf.com/en/map/5g> (May-July 2024)

# Agenda



New Growth Acceleration Program (PAC)  
Decree nr. 11,632/2023



National Program to Improve Quality and Mobile Broadband Coverage (ConectaBR) Ordinance MCOM nr. 10,787/2023



Enec – National Connected Schools Strategy  
Decree nr. 11,713/2023



National Pole Sharing Policy  
MCOM/MME Interministerial Ordinance No. 10,563/2023



# 5G Deployment (rights and obligations)

## 3.5 GHz Band Usage (rights of the Operator)

1. 30/Jun/2022: Capitals and DF;
2. 01/Jan/2023: > 500k inhabitants;
3. 30/Jun/2023: > 200k inhabitants & 25% of municipalities of Annex XIV-B;
4. 30/Jun/2024: > 100k inhabitants & 50% of municipalities of Annex XIV-B;
5. 30/Jun/2025: 75% of municipalities of Annex XIV-B;
6. 01/Jan/2026: all other municipalities;

Oferta 5G (stand alone)		N° de municípios	2022	2023	2024	2025	2026	2027	2028	2029	2030
<b>Faixa de 3,5 GHz Lotes Nacionais</b>	Capitais	27 municípios	31 .Jul 1 ERB/ 100 mil hab	31 .Jul 1 ERB/ 50 mil hab	31 .Jul 1 ERB/ 30 mil hab	31 .Jul 1 ERB/ 10 mil hab					
	Acima 500 mil hab.	26 municípios				31 .Jul 1 ERBs/ 10 mil hab					
	Até 500 mil hab.	102 municípios					31 .Jul 1 ERBs/ 15 mil hab				
	Até 200 mil hab.	171 municípios						31 .Jul 1 ERBs/ 15 mil hab			
	Até 100 mil hab.	848 municípios							50% até 31 .Jul 1 ERBs/ 15 mil hab	100% até 31 .Jul 1 ERBs/ 15 mil hab	
<b>Faixa de 3,5 GHz Lotes Regionais</b>	Abaixo de 30 mil hab.	4396 municípios					30% até 31 .dez	60% até 31 .dez	90% até 31 .dez	100% até 31 .dez	
<b>Obrigações adicionais (ágio)</b>	Localidades	1699 municípios									100% até 31 .dez com pelo menos 1 ERB 5G



# PAIS: Connected North

**59 municipalities**

Digital Inclusion  
Schools, Hospitals, Homes, Communities

**10 million**

People accessing  
broadband Internet

**12,000 Km**

Subriver optical cable



**ODS**

4 Quality Education  
9 Infrastructure  
10 Reduced inequalities  
11 Sustainable cities and communities

