GSMA

600 MHz in Brazil
Bridging the Gap Towards Digital Inclusion

Low-band spectrum such as 600 MHz can act as a bridge towards digital inclusion, levelling up access to connectivity between urban and rural areas and helping deliver a lifeline towards economic growth.

Reallocating the 600 MHz band (614-698 MHz) from TV broadcasting to mobile broadband presents a promising route for Brazil to enhance its digital infrastructure and address growing demands for connectivity.

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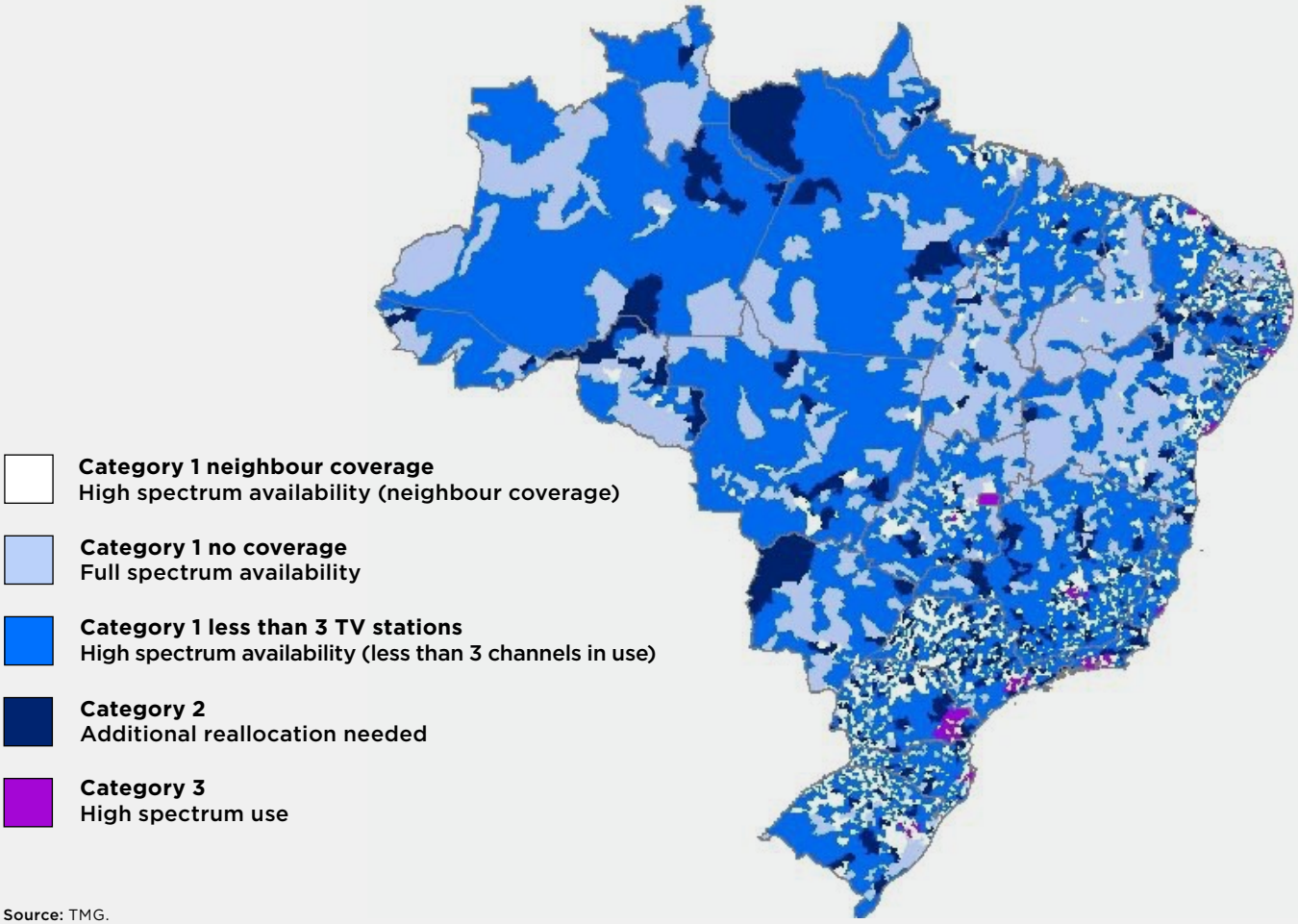
Low-band spectrum is a driver of digital equality, reducing the gap between urban and rural areas and delivering affordable connectivity. Without sufficient low-band spectrum, the digital divide is likely to widen, and those living in rural areas will be excluded from the latest digital technologies.

Low bands play an important role in achieving the social goals of widespread connectivity. Their superior propagation characteristics make them particularly suitable for providing coverage in rural and remote areas.

Brazilian cities can be split into three categories of 600 MHz use:

1. Cities with spectrum availability.
2. Cities requiring additional reallocation.
3. Cities with high spectrum use.

Figure 1
Brazilian municipalities per category of TV broadcasting occupation of the 600 MHz band



Source: TMG.

The regulatory framework to reallocate the 600 MHz band should consider three interrelated factors:

1. The current level of occupation of the band in each geographic area.
2. The need to amend existing regulations to implement the reallocation mechanism.
3. The reduction of reallocation costs.

A migration plan for the 600 MHz band should consider the following elements:

- Publish or update all necessary regulations for the band's mobile allocation, destination and conditions of use.
- Consider technical studies to create clusters for all Brazilian cities based on levels of reallocation complexity.
- Design a phased approach for the availability of the band for mobile services, including block configuration and auction rules.
- Develop the assignment process focused on delivering digital inclusion and not raising revenue or recovering unnecessary costs.
- Create an implementation group to manage the migration, formed by Anatel, the Ministry, Operators and Broadcasters.
- Ensure international coordination, where necessary.

Table 1
The regulatory framework

	Number	Required action
1. Urban areas with spectrum availability (typically smaller towns)	5,186	**A.** If needed, encourage reallocation on a voluntary basis to the lower UHF band.
2. Urban areas requiring additional reallocation (typically mid-sized cities)	298	**A.** Encourage the allocation on a voluntary basis to the lower UHF band. **B.** Introduce multiprogramming.
3. Urban areas with high spectrum use (typically larger cities)	86	**A.** Encourage reallocation on a voluntary basis to the lower UHF band. **B.** Introduce multiprogramming. **C.** Terminate licenses that are not in use or are underutilised. **D.** Reallocate channels to the VHF band. **E.** Design a monetary intervention to promote reallocation.

Phase 1 – Clearing the Band

Reallocating the 600 MHz band holds significant promise for Brazil's connectivity goals, especially in light of surging data demands and the need for equitable digital access. The process is technically complex, though feasible, provided that policymakers adopt a flexible, region-specific approach supported by updated regulations.

Figure 2
TV broadcasters' regulatory process

Clear roadmap, including timeline and responsibilities	Publication of technical rules to guide usage of the band	Clear identification of costs and funding
– Establish plan to conduct the process and consult with relevant stakeholders. – Include a feasible, but concise timeline for the reallocation to ensure cooperation and commitment. – Assign responsibilities to actors involved in the process, including telecom operators and broadcasters.	– Include details of channelling, spectrum assignment, and interference measures. – Anatel and Ministry to define treatment of existing broadcasters, with priority to seek voluntary migration.	– Identify the costs incurred by TV broadcasters to conduct the reallocation. – Analyse the actual usage of channels and consider multichannelling. – Focus on digital inclusion. – Determine levels of compensation and assign funding.

Figure 3
TV broadcasters' regulatory framework

For the successful reallocation of TV broadcasters, the regulatory framework should:

1 Implementation feasibility	2 Spectrum availability	3 Amendments to regulatory framework	4 Identification of costs and funding
– Assess feasibility of the process, including conducting consultations and sharing information with relevant stakeholders to guide the process.	– Analyse spectrum availability in the UHF band and, if needed, reallocate TV broadcasters in the VHF band.	– Amend current regulations that may limit the transition including to allow multichannelling.	– Clearly identify actual costs of the process and sources of funding.

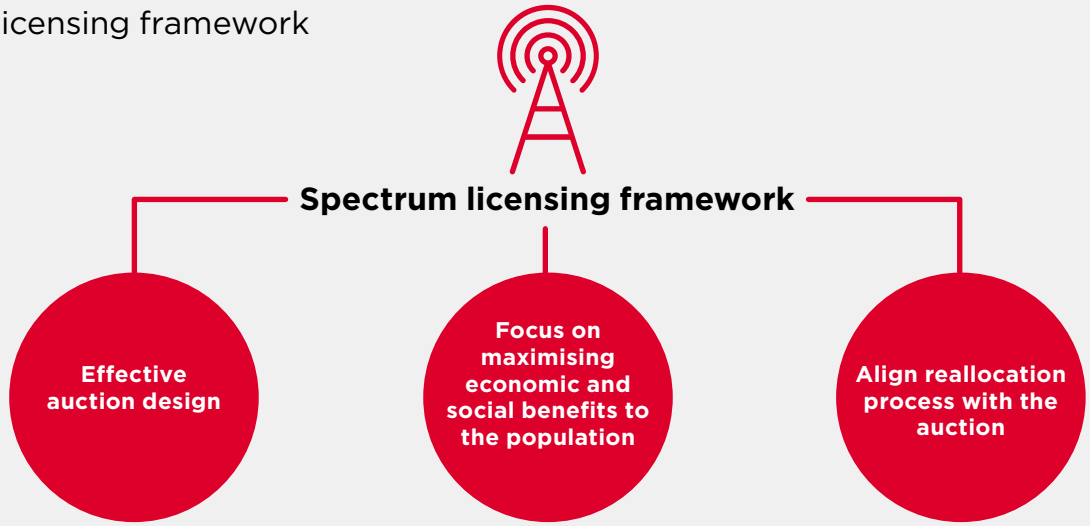
Phase 2 – Assigning 600 MHz to MNOs

An efficient framework to assign the 600 MHz band for mobile broadband is required. To do so, Anatel should:

1. Establish an efficient auction design and licensing process.
2. Ensure that spectrum prices focus on cost recovery and promoting digital connectivity.
3. Auction the spectrum ahead of the completion of the reallocation process.

The following section provide recommendations to achieve these objectives.

Figure 4
Spectrum licensing framework



Designing an effective auction framework to license the 600 MHz band for mobile services requires balancing multiple aims:

1. **Equitable cost recovery:** Reserve prices should cover broadcasters' reallocation expenses while remaining low enough to encourage robust participation by mobile operators.
2. **Phased licensing:** Initiating the auction process before every municipality is cleared can accelerate 5G deployments in areas already free of TV stations, optimising spectrum use.
3. **Clear cost allocation:** Establishing an independent entity or fund to manage broadcaster reimbursement helps preserve transparency and fairness, minimising disputes among stakeholders.
4. **Flexible implementation:** The auction must allow operators to deploy services in phases, enabling a smooth rollout that progresses at the pace of broadcast migration and market demand.

International experience

The 600 MHz band is already available elsewhere in the world in countries where it has been successfully cleared and/or assigned to MNOs.

Canada

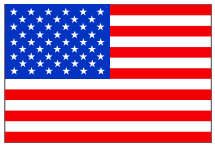
- Coordination with neighbouring countries.
- Effective management of relationships with broadcasters.
- Spectrum availability for broadcasters.

Mexico

- Regulatory foresight and proactive planning.
- Streamlined reallocation process.
- Addressing demand challenges.

Saudi Arabia

- Minimal existing use of the 600 MHz band.
- Cross-sector regulatory coordination.



United States

- Addressing political resistance from TV broadcasters.
- Evaluating process complexity and costs.

Summary

The following recommendations should be considered to address the different steps of the reallocation process:

1. **Develop a phased, flexible timeline:**
   Establish a structured yet adaptable timeline that balances independently the implementation of TV 3.0 with the gradual release of the 600 MHz band. This timeline should provide flexibility for delays in regulatory approvals and technological deployments, ensuring alignment between broadcasters and mobile operators.

2. **Freeze licensing of new TV stations in the 600 MHz band:**
   To avoid further spectrum congestion, MCom should temporarily halt the issuance of new licences for TV stations in this band. This measure will facilitate smoother reallocation by reducing the need to accommodate new players during the transition.

3. **Incorporate economic incentives:**
   Addressing the financial burden on broadcasters for relocating channels will require targeted economic incentives. A well-structured auction should include mechanisms to compensate broadcasters while simultaneously ensuring costs for mobile operators are kept low to maximise the spectrum's impact on digital inclusion.

4. **Strengthen technical coordination and conduct interference analysis:**
   A comprehensive technical framework should manage interference between mobile and TV broadcasting services. This includes defining minimum separation distances, adjusting antenna parameters, and optimising channel assignments. In congested areas, shared channels and multiprogramming must be deployed to maximise spectrum efficiency.

5. **Reassess TVA channel usage:**
   Many TVA channels, originally licensed for subscription TV, now function as free-to-air broadcasters, creating regulatory inconsistencies. Reevaluating their role and incorporating them into the broader reallocation plan will free up additional spectrum, particularly in urban areas with high demand.

6. **Enhance stakeholder collaboration:**
   Close cooperation between MCom, Anatel, TV broadcasters, and mobile operators is essential. Regular stakeholder consultations, data-sharing, and collaborative technical studies will help align priorities and resolve challenges efficiently. This coordinated effort will ensure the reallocation process is transparent and inclusive.

7. **Address the costs of assigning the band for mobile services:**
   Reserve prices for the 600 MHz band auction should be carefully calibrated to reflect the actual costs of reallocation, such as compensating broadcasters, while avoiding inflated fees that could deter mobile operators from participating. The auction process must prioritise affordable access to spectrum, enabling investment in network deployment, especially in underserved rural areas. Any surplus revenue from the auction should be reinvested in enhancing digital connectivity, ensuring long-term socio-economic benefits.