

Policy Trends in the Aftermath of Single Wholesale Networks





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1. Spectrum policy for coverage and adoption



Expanding the coverage of mobile networks, while enhancing service quality and adoption, including in underserved areas, is a prominent government policy issue in all areas of the world. While competitive mobile markets have proven effective in delivering network expansion, government policies can also facilitate network development.

Modern licensing trends for mobile spectrum focus on delivering value for governments and consumers by encouraging growth in the quality and availability of mobile networks. Since the economic downturn of the early 2010s, followed by the 2020 pandemic crisis, the requirement to use mobile in support of both social needs and economic growth has been reflected in mobile licensing.

This has seen governments move away from high-cost, punitive licensing processes to licensing conditions which encourage roll-out and expand coverage. It has also seen governments move away from interventionist policies such as single wholesale networks (SWNs) to other, more collaborative policies which encourage investment in underserved areas, deliver mobile capacity and encourage adoption.

The coverage gap,¹ the proportion of any population which lives outside of mobile coverage, is decreasing and stands at around 5% globally. It is closing most quickly in those areas where coverage was a lower percentage of the population covered in the first place while the final few percentage points in countries with a lower coverage gap tend to close more slowly.

Meanwhile the usage gap, the percentage of people living within mobile coverage but not accessing mobile broadband, stands at 40% globally but is higher in middle-income countries. Spectrum policy can have a direct impact on lowering the usage gap by encouraging the quality and affordability of mobile services.

All governments must carefully consider their approach to increase the quality and reach of next-generation mobile broadband. The GSMA supports policies which encourage governments, regulators, and mobile operators to collaborate on long-term solutions.

1. <https://www.gsma.com/r/somic/>

1. Affordable access to low-band spectrum promotes mobile coverage and increases capacity.

- Low bands (< 1 GHz) offer capacity for wider coverage and promote digital equality, bringing the latest technologies to remote areas.
- Research² shows high spectrum prices are linked to slower network speeds as well as lower coverage.
- Constraints on low-band spectrum³ will increase base station density, increase the cost of covering sparsely populated areas and restrict the business case for rural coverage.

2. Setting-out a robust spectrum roadmap allows long-term planning and minimises OpEx.

- Spectrum roadmaps allow operators to plan their networks with the maximum efficiency, enhancing the business case for base stations in less-populated areas.
- Mobile networks require long-term insight on their likely access to spectrum in low-, mid- and high-bands to facilitate planning.
- Predictability, driven by national broadband plans and spectrum roadmaps, encourages investment in underserved areas.

3. Technology neutrality and spectrum re-farming deliver efficiency.

- Technology neutrality enables spectrum to be used efficiently by mobile operators. It allows the newest, most energy-efficient technologies offering the highest quality of service, to be available throughout their footprint.
- Allowing consumers to take advantage of the most spectrally efficient technologies enhances download speeds, increasing the productivity of mobile services.

4. Voluntary infrastructure sharing will support wider coverage.

- Voluntary infrastructure sharing, including public, and spectrum trading, can avoid duplication of network infrastructure.
- Voluntary sharing can support improved mobile services by enabling cost-effective implementations via higher investments.

5. Voluntary spectrum leasing or trading can maximise efficiency.

- Unused, or lightly-used, spectrum can be shared, transferred, or leased in order to be used more efficiently.
- Voluntary sharing encourages efficiency by allowing spectrum rights to be transferred to those who will make better use of them.

6. Elimination of sector-specific taxation delivers growth.

- High taxes impact cost of ownership and as this increases, adoption of mobile services is limited.⁴
- As such, high-taxes pose a risk to the growth of the services among citizens, limiting the social and economic benefits associated with mobile technology.

7. Resilient assignment processes help streamline planning.

- Predictable licensing and regulatory frameworks support operators' long-term investments required to support digital economies. Poor auction / assignment design can lead to inefficient or failed assignments that undermine competition.⁵

8. Streamlining of Quality-of-Service requirements will support roll-outs.

- Strenuous conditions on quality of service will often not be the most beneficial approach when developing rural coverage.
- Stringent coverage obligations may lead to costly duplication of network infrastructure and force operators to deploy networks at a speed which is commercially damaging to their business plans.
- Measures that improve the commercial viability of extending coverage are more likely to be achieved, and at lower cost, than seeking to enforce licence obligations.

2. <https://www.gsma.com/spectrum/resources/effective-spectrum-pricing/>

3. <https://www.gsma.com/spectrum/wp-content/uploads/2022/07/5G-Low-Band-Spectrum-1.pdf>

4. <https://www.gsma.com/publicpolicy/regulatory-environment/taxation>

5. <https://www.gsma.com/spectrum/resources/spectrum-auctions/>



SHARING TO ENHANCE COVERAGE: CASE STUDIES

UK: Non-Spot Network



The UK's Shared Rural Network (SRN) project is a non-mandated joint operator and government initiative designed to improve mobile coverage in rural areas of the UK. The overall objective of the project is to increase total 4G coverage to 95% by 2026.

To deliver the programme, EE (BT), Vodafone, O2 and Three UK will invest £532m to eliminate the majority of 'partial not-spots' – areas which receive coverage from at least one, but not all, operators. The UK Government will provide a further £500m to build new masts to eliminate 'total not-spots' – hard to reach areas where there is currently no coverage at all.

This was a collaborative solution, put together through commercial agreements between the mobile operators and has proved far more successful than the monopoly wholesale approach of SWNs. The UK example, rather than a government monopoly, is a single, commercially shared network with a focus solely on areas where competitive networks are not currently commercially viable.



Brazil: RAN Sharing Agreements



TIM & Vivo (2015 and 2020): RAN sharing agreement for a single grid approach allowing for increased network capacity and spectrum efficiency through frequency sharing in the multi-operator core networks RAN sharing (MOCN). The spectrum used is in 2.5 GHz. According to the agreement between the operators, the network sharing encompasses 349 municipalities in 22 states, in particular, locations with low population density.

Vivo & Claro (2021): RAN sharing agreement for Claro to share Vivo's 3G networks, including spectrum and 81 radio base stations in cities with less than 30 thousand inhabitants and in highways. The main goal is to optimise the network at places with low population density and ensure that rural coverage was enhanced.



2. The demise of Single Wholesaler Networks



Single wholesale networks (SWN), which some countries considered and tried to develop in the mid-late 2010s, are fading as a trend. Policymakers in some countries considered SWNs instead of relying on competing mobile networks to deliver mobile broadband services in 4G or 5G. These are also known as single-distributor, government-initiated monopolies or wholesale open access networks (WOAN).

Supporters of SWNs argued that they would address some concerns better than the traditional model of network competition in some markets. These concerns generally included inadequate competition or lack of coverage in rural areas, inefficient use of radio spectrum, and fears that the private sector may lack incentives to maximise coverage or investment. However, SWNs have not proved successful in solving any of these problems to date and the plans have largely been abandoned for competition-based approaches.

Government-initiated network monopolies mandate mobile operators and others to rely on wholesale services from the SWN as they serve and compete for retail customers. While there are variations in the SWN proposals discussed and implemented by different governments, in most cases, operators are also limited to provide mobile broadband in one technology (4G or 5G) solely via the SWN.

SWNs: Expectations vs Reality









Expectations	 Higher coverage	 Faster MBB adoption	 Lower Prices	 Competition and GoS
Reality	Coverage growth slower in comparison to competitive roll-out	Adoption has been limited and did not follow SWNs coverage roll-out	Prices have not been reduced and users may pay a premium	Lower levels of innovation, social-economic benefits and restricted quality of service
Expectations	 Investment-friendly environment	 Easy capacity availability	 Spectrum efficiency	 Less issues to government
Reality	SWN licensees have not been able to recoup investments	Negotiations not commercially attractive	Idle or non-used spectrum ranges	Governments to solve challenges via reversions and investments

Table 1
Global examples of deployments, updates and reversals

Country	SWN	Spectrum	Status
Malaysia	Digital Nasional Berhad (DNB) – Government owned	700 MHz 3.5 GHz 28 GHz	Original SWN has achieved some coverage (70%) but low 5G take-up (5%). Second network to be developed. Tech neutrality not yet available for MNOs' current holdings.
Rwanda	Korea Telecom Rwanda Networks (KTRN) – Government – KT Corp	800 MHz	All coverage targets were met with the original SWN. However, 4G adoption is low (7%). A new 2022 broadband policy reversed plans and allowed technology neutrality for existing MNOs, allowed 4G and 5G competition and made additional low-band spectrum available.
Belarus	beCloud 4G	800 MHz 1800 MHz 2.6 GHz	Operational. 4G SWN has been operated by beCloud since 2015, but in partnership with all other MNOs. LTE penetration reached 61% and population coverage 98% in 2023. QoS is a challenge - Ookla rates Belarus at 135 out of 145 countries globally.
Mexico	Red Compartida by Altán Redes – Government: majority shareholder – Morgan Stanley – World Bank (IFC) – China-Mexico fund	700 MHz	Some coverage achieved (71%) but targets not met and have been extended (twice) to 2028. Bankruptcy filed in 2022 and low percentage of mobile subscribers (7%) using network.
Poland	Poland 5G	700 MHz	Plans cancelled. Proposal included in a draft law on cybersecurity was widely criticised. Legislator abandoned the introduction of the Polish 5G company in early 2023.
Colombia	Red Compartida	3.5 GHz	Plans cancelled. A 5G SWN was briefly considered in 2021. The idea was refuted and faded away in months. By the end of 2023, Colombia is set to hold a competitive 3.5 GHz auction for 5G.
South Africa	Wholesale open-access network (WOAN)	700 MHz 2.6 GHz 3.5 GHz	Plans cancelled. WOAN was part of the National Integrated ICT Policy White Paper, published in 2016. The lack of interested investors and support by industry players led to policy amendment by the cabinet in 2022.
Kazakhstan	Government-led SWN	3.5 GHz	Plans cancelled. Proposal of a 5G SWN did not get support after discussions between industry and government. At the end of 2022, a competitive 3.5 GHz auction was held, and new rounds of low and mid-bands are in the pipeline.



SINGLE WHOLESALE NETWORKS: CASE STUDIES



Rwanda: Plans reversed and technology neutrality allowed



BACKGROUND

Korea Telecom Rwanda Networks (KTRN) is a wholesale-only 4G mobile network established in 2013 with a 25-year license through a partnership between the government of Rwanda and Korea's mobile network operator KT. KTRN was assigned spectrum in the 800 MHz band for its 4G network. The objective of the government was to accelerate 4G roll-out.

COVERAGE

As per the 2013 Broadband Policy, the coverage targets were as below and have been met:

Phase 1 - 40% coverage	June 2014
Phase 2 - 60% coverage	March 2015
Phase 3 - 85% coverage	June 2016
Phase 4 - 95% coverage	June 2017

Although coverage targets have been met, 4G adoption in 2023 remains in 7%.

RETAIL COMPETITION

The mobile operators could not launch their own 4G networks until July 2023 following the introduction of competition by the 2022 broadband policy. This lengthy monopoly on 4G in the country has had a negative impact on take-up of services and meant that customers have suffered from high 4G prices, lowering take-up.

IMPACT OF POLICY

Today, KT is still offering services using the 800 MHz band to provide 4G wholesale. Resellers, including the MVNO Mango, resell the service to consumers but uptake is extremely limited. With the introduction of technology neutrality, and assignment of additional spectrum in the 700 MHz, 900 MHz 1800 MHz and 2100 MHz bands, MNOs have successfully launched 4G services. 800 MHz will be available after replanning of the current usage by the regulator.





SINGLE WHOLESALE NETWORKS: CASE STUDIES

Malaysia: Plans updated and reversed towards a dual 5G network



BACKGROUND

The Malaysian government decided to proceed with the SWN approach to the national 5G rollout in 2021. The SWN operator – Digital Nasional Berhad (DNB) – would take responsibility for infrastructure rollout. Ericsson was selected as the 5G network equipment provider after a tender process in July 2021. DNB is currently fully owned by the government although there are ongoing discussions with MNOs on equity stakes.

COVERAGE

DNB reports that 5G coverage reached 66.8% of populated areas as end July 2023. The target is for DNB to achieve 80% coverage by end-2023.

RETAIL COMPETITION

All major operators (Maxis, CelcomDigi, Telekom Malaysia, U-Mobile and YTL Communications) have signed access agreements with DNB. As of Q2 2023, 5G adoption stands at around 5% in Malaysia.

IMPACT OF POLICY

The Malaysian government announced in May 2023 that a second 5G network will be allowed once DNB achieves 80% coverage of populated areas. A government task force has been set up to ensure a smooth transition to a dual network model.



Mexico: SWN operational, but under bankruptcy filing and low subscriber base



SWN IMPLEMENTED

The 4G SWN was launched by Red Compartida in 2017. In June 2022, the project was rescued by the Mexican Government after the operating company filed for bankruptcy.

COVERAGE

The initial government target was to reach 92.2% of coverage by January 2024. This date has been postponed twice and now the target is 2028. Current coverage is 71%.

RETAIL COMPETITION

Operators can deploy 4G in other bands and none of the traditional operators have services implemented in the SWN, only MVNOs.

IMPACT OF POLICY

90 MHz of the 700 MHz band are currently connecting only about 6 million subscribers, out of 85 million existing unique mobile broadband subscribers in Mexico.

3. Regulation in the modern marketplace

As detailed in the first section of this report, supportive government policies which aim to collaborate with the private sector will have a stronger impact than interventionist actions like the mandate of a single supplier as through the SWN model.

Supporters claimed that wholesale networks could deliver greater coverage than market competition. While coverage targets have indeed been achieved in some markets, this is not the case for the majority of the implementations. SWNs have not delivered higher 4G or 5G adoption in any of the above markets and have thus failed to deliver additional connectivity. In fact, mobile broadband adoption is significantly lower in SWN markets than in countries with a competitive network structure.

The inefficient use of spectrum that SWNs have often instigated has had a negative impact.

On top of this, SWNs require significant public subsidies and other forms of support such as lower spectrum fees. These support options are typically not available to competing network operators.

Network competition delivers mobile network coverage and broadband adoption but can be bolstered by supportive government policies. In areas where building networks is not economically viable there are other approaches, including voluntary network sharing, as listed in the first part of this report.

Enabling competition and encouraging private sector investment are proven methods of developing connectivity in underserved areas. The growth of mobile broadband, and with it the social and economic development of the world, depends on collaboration rather than intervention.



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