Allocation limits advice for 850 MHz expansion and 900 MHz band spectrum allocation

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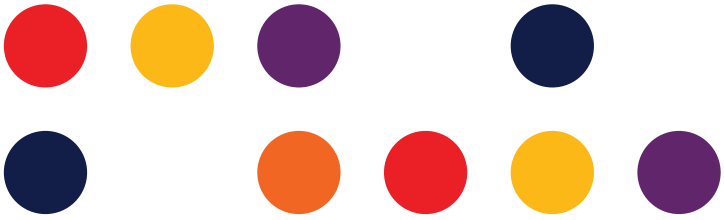

Public

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***Disclaimer**: Certain statements in this submission are based information available to TPG Telecom Ltd (**TPG**) at the time of writing. The statements reflect TPG's views based on available information about the auction design, the Minister's proposed approach to guaranteeing 2x5 MHz in the 900 MHz band for only TPG and Optus, geographic and frequency lot configuration, and past approaches to setting starting prices and spectrum access charges.*

Given a number of the above matters are still not finalised, for the purposes of this submission, TPG assumes that:

- *each TPG and Optus are guaranteed a 2x5 MHz lot in the upper 4 lots of the 900 MHz band at the starting price*
- *the lowest 850 MHz extension lot will be set aside for Public Safety Mobile Broadband and excluded from the allocation process*
- *the 850/900 MHz licences are national, and*
- *Telstra will not be given a guaranteed lot in the 900 MHz band.*

TPG may update or revise the statements as a result of new information or future events.

Summary

TPG welcomes the opportunity to make this submission to the Australian Competition and Consumer Commission's (**ACCC**) Consultation Paper on its allocation limits advice for 850 MHz expansion band and 900 MHz band spectrum allocation (**850/900 MHz allocation**).

Sub-1 GHz spectrum[1] is critical to the provision of mobile services in Australia, enabling broad geographic coverage in regional areas and deep indoor coverage in urban environments. Prior to the merger that formed TPG (in May 2020), the distribution of sub-1 GHz spectrum was skewed heavily in favour of Telstra across most of Australia (see **Table 1**). The concentration in sub-1 GHz holdings has been a key factor behind Telstra's enduring dominance of the mobile services market.

[1] Sub-1 GHz spectrum means spectrum that is both suitable for mobile services and available, or imminently available, for use in Australia. Currently, this is limited to spectrum in the 700, 850 and 900 MHz bands.

Table 1: Pre-TPG merger sub-1 GHz holdings[2]

MNO	Sydney, Melbourne, Brisbane, Adelaide, Perth, Gold Coast, Newcastle, Wollongong, Geelong^		Rest of Australia	
	Paired MHz	*Share of industry sub-1 GHz spectrum*	*Paired MHz*	*Share of industry sub-1 GHz spectrum*
TPG	23.2	29%	18.2	23%
Telstra	38.4	48%	43.4	54%
Optus	18.4	23%	18.4	23%

Notes: ^Includes surrounding areas.

The proposed 850/900 MHz allocation will have a profound and lasting impact on the structure of the Australian telecommunications market. Analysts suggest that spectrum is a major driver for mobile services competition and long-term industry outcomes.[3] There is a strong correlation between each mobile network operator's (**MNO**) share of sub-1 GHz spectrum and its revenue share.[4] To that end, the proposed 850/900 MHz allocation could promote competition in downstream markets by improving the distribution of sub-1 GHz spectrum but there is a risk that it (again) results in excess concentration of sub-1 GHz spectrum holdings in the Australian market and leads to poor outcomes for downstream competition.

Allocation limits for the proposed 850/900 MHz allocation are essential. In the absence of effective allocation limits, there is a prospect of excess concentration of sub-1 GHz spectrum and the valuations for some bidders could comprise the economic value of the spectrum *plus* an economic rent associated with the deprival of spectrum to competitors. Large incumbents have the ability and incentive to utilise the economic rents to outbid rivals and acquire large spectrum holdings to insulate themselves from competition. Smaller operators are unlikely to have the same ability to bid in this manner due to financial constraints and lack of access to the infrastructure and subscribers required to maximise economic rents. Hence, without allocation limits, there is likely to be reduced competition in downstream markets

Allocation limits should be set at **40% of the sub-1 GHz spectrum** immediately available post-allocation (that is, 2x100 MHz). This proposed allocation limit will minimise the potential for concentration of spectrum holdings while encouraging an economically efficient use of the spectrum. It considers bidders' spectrum endowments, which means the amount of new spectrum that can be acquired will vary between bidders at the proposed 850/900 MHz allocation. Critically, the proposed limit encourages economically efficient allocation of the

[2] References to the Merger here and in other parts of this submission refer to the merger between TPG Telecom Limited and Vodafone Hutchison Australia Pty Limited in July 2020.
[3] Macquarie Research (2014), *Wireless spectrum*, 23 January.
[4] Mobile service revenue in 2019: TPG (then Vodafone Hutchison Australia) - $2.4 billion (18%); Telstra - $7.3 billion (55%); and Optus - $3.7 billion (28%). Source: Company annual reports.

850/900 MHz spectrum at auction by ensuring that the maximum total demand from incumbents (2x40 MHz) is 160% of the expected supply (2x25 MHz).[5]

TPG Telecom supports the use of Australia-wide lots for the geographic configuration of the proposed 850/900 MHz allocation. Consumers have an expectation that they will be able to access mobile services wherever they travel in Australia, and sub-1 GHz spectrum is well-suited to providing wide-area coverage. Geographic lots for the proposed allocation should not be defined in a manner that arbitrarily impedes deployment of Australia-wide services. Moreover, the Australian Communications and Media Authority (**ACMA**) has identified an objective to downshift existing spectrum licences in the 850 MHz band. The downshift will be easier to implement if the proposed 850/900 MHz allocation adopts Australia-wide lots. There is a significant risk that the economic benefits of the downshift will be delayed (or potentially rendered unachievable) if there are different holders of spectrum licences that are relevant for the downshift across Australia.

The ACCC should provide its advice on allocation limits under the scenario of Australia-wide lots. TPG recognises that there are differences between incumbents' existing 850 MHz holdings for certain areas (that is, Sydney, Melbourne, Brisbane, Adelaide, Perth, Gold Coast, Newcastle, Wollongong, and Geelong) and the rest of Australia. The ACCC may consider that this warrants the adoption of a particular geographic lot configuration. However, it would be incorrect to take this approach.

Geographic lot configuration should promote competition in downstream markets and encourage the economically efficient allocation and use of the spectrum. The legacy geographic configuration from the allocation of the 850 MHz band in 1998 does not achieve these objectives.[6] In particularly, there has been a critical concentration of sub-1 GHz spectrum to the detriment of downstream competition in key geographic segments including Canberra, the Sunshine Coast, Hobart, and parts of northern NSW. The acute shortage of sub-1 GHz spectrum is observable from the relatively high auction prices competitors are willing-to-pay for imperfect mid-band spectrum substitutes in these regions compared to other regions (e.g., regional 1800 MHz auction, omnibus auction, and the 3.6 GHz auction).

Bundling these types of areas in a broadly defined regional category is likely to advantage Telstra because it removes the complementary areas (i.e., the metropolitan areas) where competitors are strongest while retaining the complementary areas where Telstra is strongest (i.e., regional and remote Australia). If different geographic lot configurations to the use of

[5] The maximum total demand and expected supply excludes two 2x5 MHz lots identified by the Minister as having grounds to be guaranteed to Optus and TPG Telecom however the methodology is resilient to the potentially different approaches the Minister could take to the set aside. The lowest 2x5 MHz of the 850 MHz extension band is also excluded.

[6] TPG notes that the ACMA has indicated during the 850/900 MHz Tune-up on 15 December 2020 that the current 850 MHz licence boundaries are suboptimal. TPG supports the ACMA's view.

Australia-wide lots are contemplated by the ACCC then they should be the subject of a public consultation before decisions are finalised.[7]

The ACCC should have regard to technology influences on the frequency bandwidth should when setting allocation limits. Channel sizes for the deployment of internationally harmonised 4G networks include 1.4 MHz, 3 MHz, 5 MHz and multiples of 5 MHz thereafter up to 20 MHz. The channel sizes for 5G networks start at 5 MHz and, for sub-1 GHz, typically increase in multiples of 5 MHz thereafter. Therefore, from the perspective of setting allocation limits, the practical minimum frequency bandwidth is 2x5 MHz and MNOs can utilise this amount of spectrum as evidenced by TPG's (then Vodafone Hutchison Australia) acquisition of 2x5 MHz from unsold 700 MHz auction and the potential that TPG (or Optus) may only end up with 2x5 MHz in the 900 MHz band if the Hon Paul Fletcher, Minister for Communications, Cyber Safety and the Arts (**Minister**) guarantees this spectrum through the proposed 850/900 MHz allocation process. The ACMA has also indicated a preference to use frequency lot sizes of 2x5 MHz.[8] Given these considerations, the ACCC should be comfortable setting allocation limits at any multiple of 2x5 MHz.

[7] The ACMA indicated it intends to consult on alternate lot configurations in January and February 2021. The ACCC should conduct a targeted consultation with selected stakeholders if the ACMA informs it of an intention to deviate from the use of Australia-wide lots.
[8] ACMA (2020), *850/900 MHz allocation process*, Tune-up session, 9 December.

1 Principles for setting allocation limits

The ACCC requires a clear set of economic principles if it is to be effective in determining whether and what allocation limits might be required for the proposed 850/900 MHz allocation. The ACCC's past advice on allocation limits has not been clear or consistent on this point.

1.1 Previous advice on allocation limits

A survey of the ACCC's previous advice demonstrates that it has not used a consistent framework in providing advice on allocation limits. For the digital dividend auction, the ACCC indicated that the principal reason for the imposition of competition limits was to prevent monopolisation and stated:

> *Applying a competition limit to prevent monopolisation requires the competition limit to be set somewhere in the range of 50-60 per cent of the available spectrum.*[9]

The outcome of the digital dividend auction was that Telstra acquired 2x20 MHz in the 700 MHz band and 2x40 MHz in the 2500 MHz band – double the spectrum that Optus acquired at the auction.

For the regional 1800 MHz, the ACCC was concerned that selling spectrum to highest bidder could weaken competition in downstream markets stating that:

> *…auction policy should consider future competition in downstream because an incumbent's value may include not only use of the spectrum to enhance its network, but also the value of keeping spectrum from a competitor.*[10]

However, the ACCC did not properly account for existing holdings when it advised an allocation limit of 2x25 MHz (of the 2x60 MHz available) for all bidders at the auction (e.g., Telstra held up to 2x15 MHz in some regions). Consequently, Telstra was able to accumulate 2x40 MHz in the 1800 MHz band while its next closest rival was only able to obtain 2x25 MHz.

For the 3.6 GHz auction, the ACCC identified "the promotion of competition in relevant downstream market as the most relevant factor to consider" in advising on allocation limits.[11] It

[9] ACCC (2011), *ACCC advice to the Minister regarding digital dividend and 2.5 GHz spectrum auction competition limits*, 27 July, p7.
[10] ACCC (2015), *Competition limits advice for 1800 MHz spectrum in regional areas*, May, p2.
[11] ACCC (2018), *Allocation limits advice for the 3.6 GHz spectrum allocation*, July, p1.

again identified concerns that “the value a bidder places on the spectrum may not only include that it can derive from use of the spectrum, but also the value of keeping the spectrum away from its competitors”.[12] It advised an allocation limit that considered existing holdings in the 3.4-3.7 GHz frequency range and was set at 2x45 MHz for Sydney and Melbourne, 2x60 MHz for other regions. This prevented Optus from acquiring spectrum in capital cities but limited its rival incumbents to less than half of Optus’ holdings in Sydney and Melbourne. The advice appeared to place special emphasis on setting aside spectrum for the pre-merger TPG Telecom entity. The Minister did not implement the advice.

1.2 The purpose of allocation limits

Allocation limits should promote competition in downstream markets while encouraging an economically efficient allocation of spectrum. Vigorous downstream competition is the best way to encourage efficient use of spectrum as competing firms have strong incentives to utilise their spectrum assets.

In determining whether allocation limits are required, the ACCC should primarily be concerned by the potential for economic rents that could be associated with two forms of concentrated outcome from the allocation process:

- one firm with significantly more spectrum post-allocation than its rivals (monopolisation risk); and
- two firms with significantly more spectrum post-allocation than their rivals (duopolisation risk).

When there is one spectrum-rich firm, rival firms may not have sufficient capacity to undercut the price or quality of offers made by the spectrum-rich firm. As such, the spectrum-rich firm may face few constraints when raising prices in downstream markets. The spectrum-rich firm does not need to deploy all its spectrum to realise these benefits so spectrum may not be efficiently used. Similar welfare-reducing outcomes could emerge when there are two firms with significantly more spectrum than rivals though the problems will be less severe than the scenario with one spectrum-rich firm. If the potential for economic rents is significant allocation limits may be required.

The assessment of allocation limits should consider both the spectrum available through the allocation process and relevant supply-side substitutes (including the potential for site densification and existing spectrum holdings).[13] Supply-side substitutes are a key determinant

[12] Ibid, pp.1-2.
[13] Substitutes may not be symmetric – for instance, sub-1 GHz spectrum may be an adequate substitute for mid-band spectrum, but mid-band spectrum is not an adequate substitute for sub-1 GHz spectrum.

in whether concentrated spectrum holdings are likely to generate economic rents post-allocation. Inadequate consideration of supply-side substitutes (e.g., the failure to identify existing spectrum holdings) could lead to an unanticipated concentration in spectrum holdings post-allocation and have a detrimental impact on competition in downstream markets.

The ACCC must strike a balance between mitigating the potential harms caused by monopolisation/duopolisation of the spectrum and enabling sufficient competitive tension in the 850/900 MHz allocation process to encourage an economically efficient allocation of spectrum. Using allocation limits to over-engineer an equal, or near equal, distribution of spectrum may not be economically efficient. MNOs will value spectrum differently due to differences between existing spectrum holdings, site deployments and the geographic distribution of MNOs' subscribers. Allocation limits must provide MNOs who highly value the spectrum highly with an opportunity to acquire it. In this context, the purpose of allocation limits is to minimise economic rent as a driver of bidders' spectrum valuation.

1.3 Principles for setting allocation limits

The ACCC has identified three criteria relevant to is assessment of allocation limits for the proposed 850/900 MHz allocation:

- promoting competition in downstream markets for the long-term interest of end-users and to encourage investment in infrastructure and innovation, including in regional Australia;
- supporting deployment of 4G and 5G technologies; and
- supporting continuity of services.

TPG supports the ACCC having regard to whether allocation limits will promote competition in downstream markets. Given there are few supply-side substitutes to sub-1 GHz spectrum (see Section 2), allocation limits should minimise the potential for concentrated spectrum holdings post-allocation while encouraging an economically allocation of the spectrum.

There are legitimate competitive and technological reasons for incumbents to pursue different spectrum outcomes at auction. Setting allocation limits that ensure excess demand among (expected) incumbent bidders encourages an economically efficient allocation of spectrum by enabling bidders to pursue different outcomes. That said, the ACCC must remain cognisant that the level of excess demand should not be so high as to encourage a bidder to value the economic rents associated with denying scarce spectrum resources to rivals.

The ACCC's advice on allocation limits should have regard to the technologies likely to be used in the 850 and 900 MHz bands. For instance, both 4G and 5G deployments can utilise carrier bandwidths of 5 MHz (or multiples thereof) so there is merit in having an allocation limit set with a 5 MHz multiple. That said, the ACCC's advice on allocation limits should generally

remain technology-neutral to have enduring value as technology may not be deployed in the manner expected by the ACCC and MNOs have a history of re-purposing spectrum to take advantage of more efficient technologies. If the ACCC's advice is underpinned by technology-based reasoning rather than economic principles it could be prone to error and may not be in the long-term interest of end-users.

The continuity of services is a relevant consideration for the ACCC's allocation limits assessment. TPG (and Optus) extensively use the 900 MHz band to deliver mobile services. The Minister has indicated that he is inclined to guarantee 2x5 MHz of spectrum in the 900 MHz band for both TPG and Optus to support continuity of services. Spectrum provided through such a guarantee should be treated in a similar manner to existing holdings for the purpose of setting allocation limits.

2 Demand for the 850 and 900 MHz bands

The 850 MHz expansion and 900 MHz bands are internationally harmonised 3GPP bands which are supported by numerous consumer devices. Both bands enable the provision of mobile services using 3G, 4G or 5G technologies, and both bands are strong candidates to support mobile networks' sub-1 GHz coverage and capacity requirements. For these reasons, we expect strong demand from all MNOs in the proposed 850/900 MHz allocation.

TPG plans to use the 2x5 MHz of 900 MHz spectrum the Minister is inclined to guarantee to support continuity of 3G mobile services.

[CIC begins] [CIC ends]

TPG wants additional sub-1 GHz spectrum. It is not possible to answer the ACCC's questions regarding the desired quantity of spectrum as this is a function of price. Some of the major determinants of price are the auction design, allocation limits and starting prices.

TPG intends to use any newly acquired spectrum for 5G mobile services. There is no difference between how TPG intends to use spectrum between metropolitan and regional areas.

3 Relevant downstream markets

TPG agrees with the ACCC's assessment that the relevant downstream market is the retail mobile services market. It does not consider that there are likely to be other future relevant markets that have not been identified.

The ACCC states that the retail mobile services market is a national market. It further states that MNO's coverage in regional areas influences demand in metropolitan areas and that competition in metropolitan areas affects the prices of services available to consumers in regional areas due to nationally consistent service offerings. The ACCC should recognise the limit that an indirect competitive constraint has on mobile services competition in regional segments. A more competitive distribution of sub-1 GHz spectrum will directly boost competition in the regional geographic segments in ways that cannot be replicated by indirect competitive constraints (see **Section 4**).

4 State of competition in relevant markets

TPG regards the retail mobile services market as competitive but notes that certain segments of the market are dominated by Telstra. This includes the enterprise segment and the provision of retail mobile services in regional Australia.

[CIC begins] [CIC ends]

The proposed 850/900 MHz allocation will have a significant influence on mobile services competition in the regional segment. The historic imbalances in sub-1 GHz spectrum, together with significant subsidies for site deployment from state and federal governments, have been major contributors to Telstra's competitive advantage in regional and remote Australia. Prior to the merger between TPG Telecom and Vodafone Hutchison Australia (**VHA**), Telstra had more than double the regional sub-1 GHz spectrum holdings of its competitors:

- TPG (then VHA): 2x18.2 MHz
- Optus: 2x18.4 MHz
- Telstra: 2x43.4 MHz

The Merger increased TPG Telecom's regional sub-1 GHz spectrum holdings by 2x10 MHz but they remain well short of Telstra's holdings in regional areas.

The proposed 850/900 MHz provides an opportunity for a step-change in the level of competition in the regional geographic segment. It increases the amount of sub-1 GHz spectrum in-market and has the potential to significantly alter the distribution of sub-1 GHz

spectrum. Sub-1 GHz spectrum is critical for mobile services competition in regional areas. Any allocation outcome that does not significantly reduce the ratio of Telstra's sub-1 GHz spectrum holdings will have a detrimental impact on competitive investment and outcomes in regional and remote Australia.

5 Current spectrum holdings

Australian MNOs have diverse spectrum holdings, and their use of different spectrum bands varies considerably. Before considering allocation limits, the ACCC should identify substitute spectrum to the 850/900 MHz bands and assess the current use of existing 900 MHz holdings.

5.1 Substitute spectrum

Existing sub-1 GHz bands should be considered in any assessment of allocation limits. These bands are substitutes. The cost of deploying a site grid for coverage is comparable across each of the sub-1 GHz bands (and much lower than higher frequency bands). While there are differences in propagation characteristics and the level of device support, these differences are negligible given the coverage benefits provided by sub-1 GHz spectrum.

Bands above 1 GHz bands should not be considered in the assessment of allocation limits. The higher frequency bands are not substitutes for the sub-1 GHz bands. The propagation characteristics of higher frequency means many more sites would be required to provide equivalent coverage to the sub-1 GHz bands. For this reason, it is not economically feasible to deploy broad-based indoor and outdoor coverage solutions using bands above 1 GHz.

5.2 Current use of the 900 MHz band

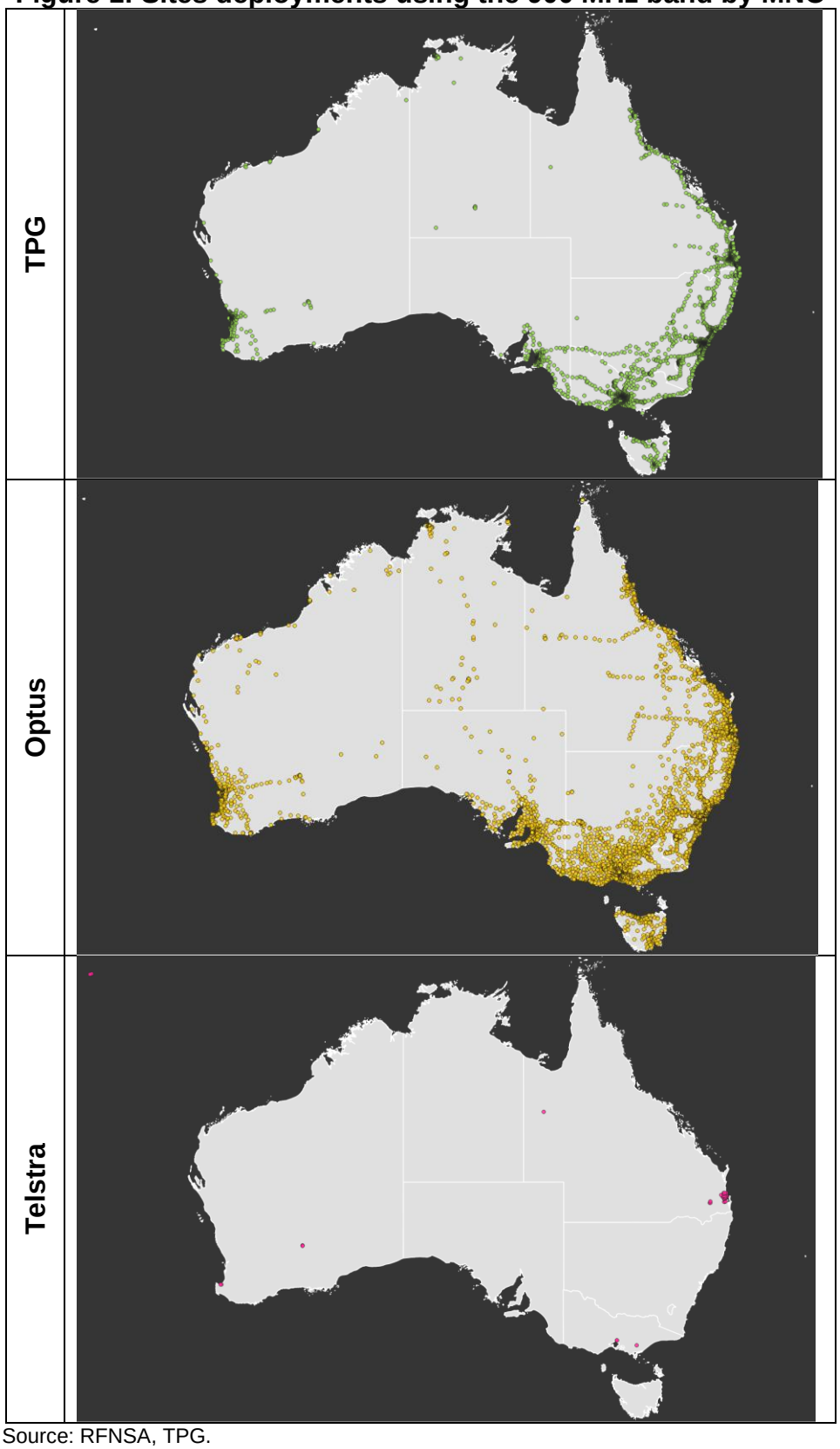
TPG and Optus rely on their existing 900 MHz holdings to deliver 3G services and both MNOs have extensive deployments using their existing spectrum (see **Figure 1**). There would be significant economic and social costs from the disruption to TPG's 3G services that might be caused by a loss of access to the 900 MHz band. This problem does not affect Telstra as it uses the 850 MHz band for 3G services.

Telstra appears to under-utilise its spectrum holdings in the 900 MHz band. It either does not use, or appears to make tokenistic use, of the 900 MHz band in many geographic areas (see **Figure 1**). Telstra does have small clusters of sites deployed around Toowoomba, north of Brisbane and on Christmas Island. However, the latter is not relevant to the ACCC's deliberations as Christmas Island lies outside the spectrum re-allocation declaration. It

appears as if Telstra's 900 MHz services could be migrated to another sub-1 GHz band at relatively low cost though we require more information to provide a definitive view.

TPG infers from the ACCC's Consultation Paper that Telstra's under-utilisation of the 900 MHz band has persisted since the 2G shutdown in 2016. The prolonged under-utilisation of highly valuable spectrum by Telstra is not economically efficient - it deprives spectrum-scarce rivals from access to critical low-band spectrum and highlights why the ACCC should limit dominant incumbents from pursuing disproportionately large spectrum allocations.

Figure 1: Sites deployments using the 900 MHz band by MNO



Source: RFNSA, TPG.

6 Setting allocation limits

Allocation limits are necessary for the proposed 850/900 MHz allocation. Allocation limits will promote downstream competition and encourage investment across metro and regional areas.

Without allocation limits, excess concentration in sub-1 GHz spectrum holdings could occur as an outcome of the allocation process. Significant imbalances in sub-1 GHz holdings may have a deleterious, long-term impact on competition due to the critical role this spectrum plays in providing indoor and outdoor coverage. Over broad geographic areas, it is not economically feasible to replicate the level of coverage offered by sub-1 GHz spectrum with site densification or spectrum in other bands.

The ACCC should set allocation limits based on the total supply of substitute spectrum (including spectrum already allocated) as this encourages efficient use of the spectrum. There are technical benefits and cost efficiencies to an operator from having all sub-1 GHz concentrated in one or two bands. For instance, it would be preferable to have 2x20 MHz in the 850 MHz band than rather than 2x10 MHz in the 700 MHz band and 2x10 MHz in the 850 MHz band. The moderate propagation benefit of the 700 MHz band is more than offset by the gains in spectral efficiency from a single 20 MHz carrier and the cost savings from deploying equipment at sites for one spectrum band rather than two. The 700, 850 and 900 MHz are supply-side substitutes and the ACCC should primarily be concerned by excess concentration across this broadly defined group not excess concentration within any one band.

The ACCC should set the allocation limit at 40% of the sub-1 GHz spectrum available for use immediately after new licences commence. There will be 2x100 MHz of sub-1 GHz spectrum available for use after the proposed 850/900 MHz allocation – 2x45 MHz in the 700 MHz band, 2x30 MHz in the 850 MHz band and 2x25 MHz in the 900 MHz band. The proposed limit accounts for differences in incumbents' sub-1 GHz holdings and is resilient to the different approaches the Minister could take to setting aside 5 MHz in the 900 MHz band to support continuity of services. The impact of the proposed 40% limit on each incumbent (and potential new entrants) is illustrated in **Table 3** (Scenario with no set aside, illustrative purposes only), **Table 3** (Scenario with 5 MHz set aside for TPG & Optus) and **Table 4** (Scenario with 5 MHz set aside for MNOs, illustrative purposes only).

With the use of Australia-wide lots for the proposed 850/900 MHz allocation, there is a minor consideration of how to treat existing holdings as these differ in quantity for different parts of Australia. Given the concentrated sub-1 GHz holdings and high market shares for Telstra outside the major capital cities, to promote competition in downstream markets it may be prudent for the ACCC to set allocation limits based on existing sub-1 GHz holdings in regional areas. Alternatively, the ACCC could recommend allocation limits based on the maximum existing holdings for each MNO irrespective of where they occur in Australia – this is the

approach illustrated in **Tables 2, 3 and 4**. The latter methodology is consistent with the approach taken to setting allocation limits for the 3.6 GHz auction.

Table 2: Impact of proposed 40% sub-1GHz limit on the spectrum that can be acquired at auction – No set aside scenario (paired MHz)

MNO	Existing holdings		Set aside	Limit on spectrum acquired at auction
	Selected areas^	Rest of Australia	National	National
TPG	25	20	0	15
Telstra	30	35	0	5
Optus	10	10	0	30
New entrant (if any)	0	0	0	40#

Notes: ^Selected areas include Sydney, Melbourne, Brisbane, Adelaide, Perth, Gold Coast, Newcastle, Wollongong and Geelong, and their surrounding areas.
Allocation limit is more than the spectrum available at auction.

Table 3: Impact of proposed 40% sub-1GHz limit on the spectrum that can be acquired at auction – Optus & TPG set aside scenario (paired MHz)

MNO	Existing holdings		Set aside*	Limit on spectrum acquired at auction
	Selected areas^	Rest of Australia	National	National
TPG	25	20	5	10
Telstra	30	35	0	5
Optus	10	10	5	25
New entrant (if any)	0	0	0	40#

Notes: ^Selected areas include Sydney, Melbourne, Brisbane, Adelaide, Perth, Gold Coast, Newcastle, Wollongong and Geelong, and their surrounding areas.
* Refers to the 900 MHz guarantee the Minister is inclined to provide TPG and Optus.
# Allocation limit is more than the spectrum available at auction.

Table 4: Impact of proposed 40% sub-1GHz limit on the spectrum that can be acquired at auction – Each MNO with 5 MHz set aside (paired MHz)

MNO	Existing holdings		Set aside	Limit on spectrum acquired at auction
	Selected areas^	Rest of Australia	National	National
TPG	25	20	5	10
Telstra	30	35	5	0
Optus	10	10	5	25#
New entrant (if any)	0	0	0	40#

Notes: ^Selected areas include Sydney, Melbourne, Brisbane, Adelaide, Perth, Gold Coast, Newcastle, Wollongong and Geelong, and their surrounding areas.

[#] Allocation limit is more than the spectrum available at auction.

Under the TPG proposal, the maximum total demand from incumbents is 2x40 MHz under the scenario where there is a 2x5 MHz set aside for TPG and Optus, which is equivalent to 160% of the available supply. This level of excess demand should ensure the proposed 850/900 MHz allocation encourages an economically efficient allocation of spectrum.

A lower limit, for instance 35% of the sub-1 GHz spectrum, would preclude Telstra from participating in the auction and mean the maximum total demand from incumbents is 100% of the available supply under the scenario of a 2x5 MHz set aside for TPG and Optus. This option may not lead to an economically efficient allocation of spectrum.

A higher allocation limit at, for instance, 45% of the sub-1 GHz spectrum creates a risk of concentrated spectrum holdings post-allocation. Specifically, it does little to reduce Telstra's share of sub-1 GHz spectrum from pre-merger levels of 54% across most parts of Australia, and it will only achieve a reduction in concentration in selected areas if Australia-wide lots are used.[14]

One way to assess concentrated spectrum holdings is to take the sum of squares for the share of sub-1 GHz spectrum held by each MNO and assess the deviation from hypothetical equal spectrum distribution (like the approach used with the Herfindahl-Hirschman Index). In a scenario where there is an allocation limit of 45% of the sub-1 GHz spectrum and Telstra acquires its maximum allocation, there could be higher levels of concentration in the selected areas than occurred pre-merger and potentially limited improvement in regional areas (see **Table 5**).[15] Such an outcome would be a regressive step for the industry.

Table 5: Sum of squared share of sub-1 GHz for scenario with a 45% allocation limit and assuming Telstra acquires its maximum allocation

MNO	Hypothetical equal spectrum distribution	Pre-merger spectrum holdings – Selected areas	Pre-merger spectrum holdings – Rest of Australia	Scenario (45% allocation limit, Telstra max) Selected areas	Scenario (45% allocation limit, Telstra max) Rest of Australia
Telstra	33	48	54	40	45
TPG	33	29	23	30-45	25-40
Optus	33	23	23	15-30	15-30
Sum of squares	3267	3674	3974	3400-3850	3550-3850

Notes: ^Selected areas include Sydney, Melbourne, Brisbane, Adelaide, Perth, Gold Coast, Newcastle, Wollongong and Geelong, and their surrounding areas.

[14] Selected areas include Sydney, Melbourne, Brisbane, Adelaide, Perth, Gold Coast, Newcastle, Wollongong and Geelong, and their surrounding areas.
[15] The assumption that Telstra acquires the maximum allocation is reasonable based on its behaviour at previous auctions.

There are compelling reasons for the ACCC to adopt an allocation limit of 40% of the sub-1 GHz spectrum for the 850/900 MHz allocation. The proposed allocation limit will promote competition in downstream markets while ensuring sufficient excess demand in the proposed 850/900 MHz allocation to encourage an economically efficient allocation of spectrum. It is also resilient to the different decisions on the 2x5 MHz set aside for continuity of services.

The proposed framework for setting limits 850/900 MHz allocation also provides a template that could be used for future ACCC advice on allocation limits and readily enables adjustments when new spectrum becomes available. This will greatly improve regulatory certainty in this critically important area.