Reconfiguring the 900 MHz band

Options paper

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Executive summary

The 890–915/935–960 MHz band (or ‘900 MHz band’) is currently apparatus licensed as three frequency division duplex (FDD) pairs. Each pair consists of either 2 x 8.4 MHz or 2 x 8.2 MHz. These licences are held by three mobile network operators—Telstra, Optus and VHA. The current frequency lot configuration is not conducive to optimally efficient carriage of 3G and 4G services. To achieve the optimal use, it is considered necessary to change the licence parameters to align with a band configuration based on 5 MHz FDD blocks.

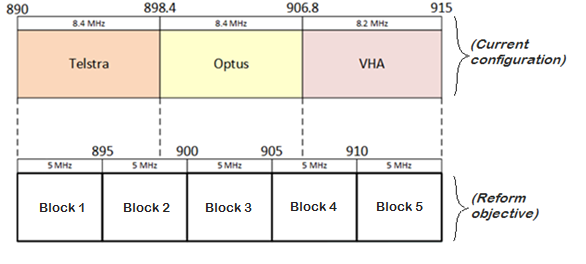
This paper provides an update to the *Reconfiguring the 890–915/935–960 MHz band: Way forward* paper. That paper stated:

… the Authority finds that a band clearance and price-based reallocation of the 890–915/935–960 MHz band … will be the most efficient and effective way of achieving a reconfiguration into 5 MHz lots and facilitating the optimal efficiency and value of the band.[[1]](#footnote-2)

However, stakeholders raised concerns that the mid-2021 clearance date could result in potential impacts on consumer services.

Given these concerns, the ACMA has reconsidered and identified two options that reconfigure the band while concurrently enabling licensees to mitigate risks to consumer services:

1. The ‘encumbered auction’ option maintains the price-based allocation approach (chosen by the ACMA in the 2017 [*Way forward*](https://www.acma.gov.au/Industry/Spectrum/Spectrum-projects/800-and-900-MHz-bands/~/link.aspx?_id=E2F6ECED7CB9499BA278A7CBC6D1A33F&_z=z) paper) but delays the date by which incumbent apparatus licensees must clear the band. This involves all available spectrum across the 900 MHz and 850 MHz bands[[2]](#footnote-3) (i.e. 2 x 25 MHz in 900 MHz, and at least 2 x 10 MHz in the 850 MHz expansion band (809–824/854–869 MHz)) being allocated as spectrum licences via price-based allocation (PBA), with those licences beginning soon after the allocation. However, this option also extends the clearance date for existing apparatus licences in the 900 MHz band to 2024 to align with the full clearance of the 850 MHz expansion band licences.
2. The ‘hybrid’ option involves administrative allocation (via conversion to spectrum licensing) of a 2 x 5 MHz block to each of the three incumbent 900 MHz licensees (which may require the ACMA to initially rationalise the apparatus licensed spectrum holdings of incumbent licensees), as well as an auction of the remaining 2 x 10 MHz (combined with the auction of the 850 MHz expansion band). This means one 2 x 5 MHz lot is administratively allocated to each of the three incumbent licensees, putting the intermediate (blocks 2 and 4) blocks to market (see Figure 1).[[3]](#footnote-4)
3. Current and proposed arrangements for the base-receive component of the 890–915/935–960 MHz band (the band is planned as an FDD pair and the corresponding base-transmit frequencies are 45 MHz higher, i.e. 935–960 MHz)



In considering the preferred approach to reconfiguring the band, the ACMA is guided by the objects of the *Radiocommunications Act 1992* (the ‘Act’), as well as the [Principles for spectrum management](https://www.acma.gov.au/Industry/Spectrum/Spectrum-planning/About-spectrum-planning/australian-spectrum-management-principles-spectrum-planning-acma).

In addition, the ACMA has identified a set of outcomes from the proposed reconfiguration process that could be used to assess the success of the reform. To be considered an effective reform process, the reconfiguration of the band should:

* result in the band being spectrum licensed
* facilitate the 1 MHz downshift in the 800 MHz spectrum licences by allocating the 2 x 1 MHz that is below the 850 MHz spectrum licences (thereby removing a key regulatory impediment to achieving the downshift)
* result in the band being configured in 5 MHz channels
* result in licensees being charged a market price, or a price informed by relevant market outcomes

enable licensees to mitigate risks to the continuity of consumer services.

A method of allocation that supports a move to larger contiguous bandwidths is expected to lead to an increase in technical efficiency.

Of the options outlined in this paper, the ACMA considers the ‘encumbered auction’ option to be the approach that best meets the objectives of the reform, and also is more likely to achieve the broader policy objectives. The ACMA recognised that the resolution of the allocation issues associated with the 900 MHz band will provide certainty to incumbents and other parties potentially interested in accessing spectrum in the band.

The following table presents a summary of the ACMA’s view of whether each option achieves the 900 MHz-specific objectives outlined above.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Status quo | Encumbered auction | Hybrid option |
| Spectrum licensed? | ✖ | ✔ | ✔ |
| Facilitate downshift? | ✖ | ✔ | **?[[4]](#footnote-5)** |
| 5 MHz configuration? | ✖ | ✔ | ✔ |
| Market price? | ✖ | ✔ | ✖ |
| Enable licensees to mitigate risks to consumer services? | ✔ | ✔ | ✔ |
| Enables move to larger bandwidth? | ✖ | ✔ | ✖ |

A final decision on a preferred configuration and allocation method will take into account the responses to this paper.

In the case of options involving clearance of apparatus licences and reallocation of the spectrum as spectrum licences, the ACMA and the Minister for Communications would be required to follow the steps outlined in the Act for reallocation of encumbered spectrum (Part 3.6 refers). In the case of options involving the conversion of apparatus licences to spectrum licences, the ACMA is empowered to make recommendations to the minister about designation of the relevant parts of the spectrum for spectrum licences (Part 2.2. refers). Nothing in this options paper should be taken to fetter the ACMA’s or the minister’s discretion in the exercise of their respective powers under the Act.

# Summary of issues for comment

The ACMA invites comments on the issues set out in this options paper or any other relevant issues. Interested stakeholders are encouraged to respond to a range of questions:

1. The ACMA identified a set of outcomes to be achieved from this process—are these the appropriate outcomes? Are there any other additional outcomes that should be included in this analysis?
2. Are the reform options presented in this paper appropriate, and are there any implementation issues that haven’t been identified?
3. Stakeholders raised concerns that the mid-2021 clearance date will result in consumer service discontinuity. Does the proposed mid-2024 clearance date provide enough time to create an alternative pathway for the deployment of services at risk?
4. Can stakeholders provide up-to-date information on consumer migration to 4G compatible handsets, including estimates of the numbers of consumers yet to migrate, and information on the timing and speed of consumer migration?
5. The encumbered auction option includes an approach whereby incumbent apparatus licences and spectrum licences would potentially ‘overlap’. Do stakeholders have any concerns with this proposed approach?
6. Are there any issues associated with the hybrid option that raise any concerns for stakeholders?
7. Are there any other mitigation techniques to consider that support reconfiguration of the band into 5 MHz configuration whilst mitigating risks to consumer services?
8. The ACMA may progress reconfiguration of 900 MHz independently of the allocation of the 850 MHz expansion band. Would doing so change the view on the optimal approach to reconfiguration?
9. The ACMA is aware that due to public safety mobile broadband (PSMB) negotiations there is a request to set aside 2 x 5 MHz of spectrum for a PSMB network. While the lot location for this spectrum in the 850 MHz expansion band has not been identified, it is expected that the remaining blocks at the top or bottom of the band would be put to market. Do stakeholders have a view on the relative technical efficiency of the remaining blocks of spectrum for carrier services?
10. The [*Draft five-year spectrum outlook 2019–23*](https://www.acma.gov.au/theACMA/draft-five-year-spectrum-outlook-2019-23) (FYSO) forward allocation scenarios outlined the feasibility of allocating the 850 MHz expansion band and 900 MHz band at the same time as 26 GHz band, which, at the time of publication of this paper, is expected to be in Q1/2 2020–21. Do stakeholders have a view on the timing of the proposed allocations?

# Background

## Problem

The 890–915/935–960 MHz band (or ‘900 MHz band’) is currently apparatus licensed as three frequency division duplex (FDD) pairs. Each pair consists of either 2 x 8.4 MHz or 2 x 8.2 MHz. These licences are held by three mobile network operators—Telstra, Optus and VHA. These are held by three mobile network operators—Telstra, Optus and VHA. Historically, these licences were used for 2G mobile telecommunications services, which have been, or are being, switched off.

The current frequency lot configuration is not conducive to optimally efficient carriage of 3G and 4G services. To achieve the optimal configuration for these services, it is necessary to change the licence parameters to align with a band configuration based on 5 MHz FDD blocks. While licensees have expressed an interest in deploying narrowband Internet of Things (NB-IoT) in the ‘remaining’ 3.2/3.4 GHz paired (i.e. the spectrum leftover after 2 x 5 MHz is put to use for 3G/4G), the ACMA considers this to be an inefficient use of this spectrum as anticipated traffic demand for NB-IoT could be met with a much smaller allocation. In addition, the 5 MHz block-based configuration is no barrier to deploying NB-IoT technologies if operators wish to do so, and therefore has little bearing on the threshold question of whether reform is necessary.[[5]](#footnote-6)

Stakeholders raised concerns that a proposed mid-2021 clearance date may result in discontinuity of consumer services. Of the three incumbent licensees, only Telstra agreed that band clearance and auction is the best method of band reconfiguration. Vodafone and Optus stated that their preferred approach was to convert the apparatus licences to spectrum licences in their current configuration. The ACMA has reconsidered and identified the options below.

An issue that is associated with the reconfiguration of the 900 MHz is the allocation of the 850 MHz expansion band. Following a review of the 803–960 MHz band in 2015, 2 x 15 MHz of spectrum that is adjacent to the existing 850 MHz spectrum licences (825–845/870–890 MHz) was identified as being optimised and potentially available for use in the medium term for mobile broadband. This band (809–824/854–869 MHz) is known as the ‘850 MHz expansion band’.

Due to its impending availability, and close substitutability with the 900 MHz band, there is a unique opportunity to allocate the expansion band in the same process as the 900 MHz band (should it be decided to reconfigure some or all of that band by auction). The ACMA is aware that through COAG public safety mobile broadband (PSMB) negotiations, there is a request to set aside 2 x 5 MHz of spectrum for a PSMB network. At the 12 December 2018 meeting of COAG all jurisdictions agreed to a strategic roadmap that set out a plan to design, implement and operate PSMB, and to continue to work together to resolve the supporting spectrum arrangements in parallel with proof of concept trials.

In addition, this paper includes consideration of the 1 MHz downshift in the 850 MHz spectrum licences. The ACMA has previously noted that the addition of a 1 MHz guard band between the 850 MHz band base-transmit segment and the 890–915/935–960 MHz base-receive segment will significantly increase the usability of the lower segment in the 900 MHz band. This can only be achieved via a downshift of the existing 850 MHz band spectrum licences. The ACMA has indicated previously that this downshift would occur when the 850 MHz licences expire in 2028 and will make recommendations to the minister accordingly (in relation to band configurations that will support the downshift) at an appropriate time to operationalise this. However, the ACMA has also foreshadowed it will look at ways to expedite this process so the benefits can be realised sooner.

The [*ACMA’s long-term strategy for the 803–960 MHz band* decision paper](https://www.acma.gov.au/theACMA/review-of-the-803-960-mhz-band) set up the process of clearing the two blocks of 1 MHz of spectrum into which the downshift would ultimately occur.

The relevant question for the purposes of this paper is to identify the appropriate means by which this 1 MHz can be allocated as a spectrum licence. It is necessary to allocate this 1 MHz paired as spectrum licences in order to enable the agreement necessary to achieve the downshift of the 800 MHz spectrum licences prior to 2028.

## Objectives and policy goals

Any assessment of options aimed at reconfiguring the 900 MHz band should be referenced against the object of the Act which is to provide for management of the radiofrequency spectrum in order to, among other things[[6]](#footnote-7):

* maximise, by ensuring the efficient allocation and use of the spectrum, the overall public benefit derived from using the radiofrequency spectrum
* provide a responsive and flexible approach to meeting the needs of users of the spectrum
* encourage the use of efficient radiocommunications technologies so that a wide range of services of an adequate quality can be provided.

The ACMA is also guided by its [Principles for spectrum management](https://www.acma.gov.au/Industry/Spectrum/Spectrum-planning/About-spectrum-planning/australian-spectrum-management-principles-spectrum-planning-acma) (the Principles), which are to:

* allocate spectrum to the highest value use (HVU) or uses
* enable and encourage spectrum to move to its HVU
* use the least cost and least restrictive approach to achieving policy objectives
* to the extent possible, promote both certainty and flexibility

balance the cost of interference and the benefits of greater spectrum utilisation.

The ACMA considered a set of outcomes from this process that would indicate the success of the reform. To be considered an effective reform process, the reconfiguration of the band should:

* Result in the band being spectrum licensed (or the equivalent under the new Act)—long-term licences with strong property rights encourage long-term investment to develop new technologies and to provide flexibility in deploying new services.
* Facilitate the 1 MHz downshift in the 800 MHz spectrum licences by removing a key regulatory impediment[[7]](#footnote-8)—the downshift is necessary to introduce a guard band between the 850 MHz and 900 MHz bands at 889–890 MHz, which will help alleviate the coexistence issues and maximise the efficiency of the band by increasing the amount of spectrum capable of providing 4G/5G services.
* Result in the band being configured in 5 MHz channels—to achieve the optimal use of the band, it is necessary to change the licence parameters to align with a band configuration based on 5 MHz FDD (paired) blocks.
* Result in licensees being charged a market price, or a price informed by relevant market outcomes—market-determined or informed prices can enhance the efficient use of spectrum by encouraging spectrum to be used by the licensees who value it most.
* Enable licensees to mitigate risks to the continuity of consumer services—the ACMA notes stakeholders’ concerns about the critical nature of 900 MHz to regional 3G coverage.
* Facilitate a move to larger contiguous bandwidths, increasing technical efficiency—individual sub-1 GHz commercial mobile bands are relatively small, so allocation of each band in isolation tends to promote fragmentation and hinder the assembly of larger (and more efficient) contiguous holdings.

## Purpose of this paper

This paper outlines two options to achieve the reconfiguration of the 900 MHz band, and is seeking feedback from key stakeholders on these options.

**Consultation questions:**

1. The ACMA identified a set of outcomes from this process that would indicate the success of the reform—are these appropriate? Are there any other additional outcomes that should be included in this analysis?

# Options

The ACMA has identified alternative options that aim to mitigate stakeholder concerns while concurrently facilitating the reconfiguration of the band into 5 MHz channel bandwidths. This section also outlines the ACMA’s consideration of relative benefits and risks of converting the 900 MHz incumbent apparatus licences into spectrum licences.

The ‘encumbered auction’ option maintains the price-based allocation approach (identified by the ACMA in the 2017 [Way forward](https://www.acma.gov.au/Industry/Spectrum/Spectrum-projects/800-and-900-MHz-bands/~/link.aspx?_id=E2F6ECED7CB9499BA278A7CBC6D1A33F&_z=z) paper) but delays the date by which incumbent apparatus licensees must clear the band. This option involves all available spectrum across the 900 MHz and 850 MHz bands (i.e. 2 x 25 MHz in 900 MHz, and at least 2 x 10 MHz in the 850 MHz expansion band) allocated as spectrum licences via price-based allocation (PBA), with those licences beginning soon after the allocation. However, this option also extends the clearance date for existing apparatus licences in the 900 MHz band to mid-2024 rather than mid-2021 previously identified. to align with the full clearance of the 850 MHz expansion band licences. In addition, the 2 x 1 MHz lot that is below the 850 MHz spectrum licensed band can be attached to the lower lot of the 900 MHz band, meaning that the eventual winner of the lower 900 MHz lot would also win that 2 x 1 MHz lot (making it in effect a 2 x 6 MHz lot, with the 2 x 5 MHz and the 2 x 1 MHz being discontiguous).

The ‘hybrid’ option involves administrative allocation (via conversion to spectrum licensing) of a 2 x 5 MHz block to each of the three incumbent 900 MHz licensees (which may require the ACMA to initially rationalise the apparatus licensed spectrum holdings of incumbent licensees), as well as an auction of the remaining 2 x 10 MHz (combined with the auction of the 850 MHz expansion band).[[8]](#footnote-9) This means one 2 x 5 MHz lot is administratively allocated to each of the three incumbent licensees and putting the intermediate (blocks 2 and 4) blocks to market.[[9]](#footnote-10)

These two options are outlined below and compared with the status quo which sees the band retained in its current configuration under the current apparatus licencing framework.

## Option 1: Encumbered auction

The encumbered auction approach is similar in approach to the 2018 3.6 GHz auction in which some incumbent licensees have been given up to seven years before being cleared from the band. The key difference in the 900 MHz context is that the incumbents are likely to be the same group of parties as the bidders. Nevertheless, the effect is similar—incumbent operators are provided with certainty of tenure which will allow them time to update their networks if they are unsuccessful in purchasing spectrum at auction. This underlines one key element of this option—a reasonable period between the auction and the apparatus licence termination date would provide incumbent licensees with the opportunity to mitigate risks to consumer services. This is one of the drivers in the current auction timeline outlined by the ACMA in the FYSO 2019-23.[[10]](#footnote-11)

This approach also enables licensees to gradually transition from their current configuration to the new spectrum licensed configuration prior to the end of the reallocation period.

It is proposed that interference protection between an apparatus licensee and the spectrum licensee be dealt with via a licence condition on the apparatus licence restricting the deployment of new sites. This approach allows the apparatus licensee to continue to service its currently serviced customers, while providing the spectrum licensee with the confidence to deploy its network in a manner that does not interfere with incumbent services.

Incumbent licensees are each currently paying approximately $28 million in annual apparatus licence fees. If they are able to purchase spectrum licences at auction, and transition to the appropriate frequency range, they would have an incentive to hand in their apparatus licence prior to the mid-2024 clearance date.

One of the key issues for licensees is the uncertain timeline for the proliferation of Voice Over LTE (VoLTE)-enabled devices among consumers. The ACMA sought information from incumbent licensees on the expected timing and speed of consumer migration towards the use of VOLTE handsets, but still has no clear indication of intended migration paths. In the absence of receiving any further information to support a more detailed assessment, the ACMA considers that the proposed timeline outlined in this option (i.e. a mid-2024 clearance date for existing apparatus licences) provides enough opportunity for carriers to mitigate risks to the continuity of consumer services.

The benefits and risks identified for the encumbered auction option are as follows:

### Benefits

* Competitive allocation of the 900 MHz band and the 850 MHz expansion band enhances the likelihood that the spectrum is allocated to its highest value use (relative to both the status quo and an approach that includes administrative allocation/conversion).
* Combined allocation of the 900 MHz and 850 MHz under this option offers appropriate incentives for an incumbent licensee to potentially exit the 900 MHz band in favour of the 850 MHz band, resulting in holdings of larger contiguous blocks. Mobile network operators have increasing returns to scale between 5 MHz and 10 MHz holdings, and therefore larger contiguous blocks are public welfare-enhancing.
* The long-term apparatus licence tenure for incumbents in the 900 MHz band (until mid-2024) provides protection for incumbents concerned about losing access to the band. Therefore, this option enables licensees to mitigate risks to consumer services.
* Should the three incumbent licensees be successful in purchasing spectrum licences at auction, this option provides them with the ability to transition to the new, more efficient configuration prior to 2024.
* This approach will result in a spectrum price that reflects market value which will help ensure spectrum is used efficiently.
* Long-term licences encourage long-term investment and development of new technologies, enhancing the efficiency of use of the spectrum.
* Relative to both the status quo and option 2, this option better provides for a new entrant to purchase spectrum to enable entry into the market, as it includes the opportunity to purchase more than 2 x 5 MHz of contiguous spectrum in the 900 MHz band.
* This option most easily facilitates the allocation of the 2 x 1 MHz below the current 850 MHz band. This approach entails attaching the 2 x 1 MHz to the lower 2 x 5 MHz lot in the 900 MHz band, which supports an environment for the market to facilitate the downshift by commercial negotiation.[[11]](#footnote-12)

### Risks

* There remains some risk that incumbent licensees may not be successful in purchasing spectrum licences in the price-based allocation.
* If this were to occur, and the licensee were unable to mitigate the loss of the spectrum, this may result in a reduction in the quality and potentially the availability of consumer services. However, the ACMA considers this risk to be negligible, for the following reason.
* In the event an incumbent licensee loses access to the 900 MHz/850 MHz expansion band (or it purchases spectrum heavily encumbered by another licensee), it has until 2024 to create an alternative pathway for the deployment of services at risk. This process provides adequate time to avoid significant consumer disruption. Indeed, a licensee may also be able to maintain access to the band via third-party authorisations and licence trading.

## Option 2: Hybrid option

A version of the hybrid option was consulted on in the *Reconfiguring the 890–915/935–960 MHz band* consultation paper released in 2017. The 2017 consultation paper framed the hybrid option as being the choice between two sub-options:

* Administrative allocation (via conversion to spectrum licensing) of a 2 x 5 MHz block to each of the three incumbent licensees, the lower (block 1), middle (block 3) and upper (block 5) to Telstra, Optus and Vodafone respectively, and putting the intermediate (blocks 2 and 4) blocks to market
* Administrative allocation of three blocks, the order in which they were allocated being determined by a market allocation process—that is, each carrier would be guaranteed 2 x 5 MHz, but would need to compete for which block they obtain.

However, for simplicity and certainty of implementation, this paper only considers the first sub-option.

The benefits and risks of the hybrid option are as follows:

### Benefits

* The option, as with the encumbered auction option, results in the successful reconfiguration of the band as spectrum licensed 5 MHz channels, albeit in a more fragmented manner. Nevertheless, long-term licences in the appropriate long-term configuration promote investment certainty for licensees.
* Each incumbent licensee is administratively allocated a spectrum licence for a single 2 x 5 MHz lot, and as such is guaranteed ongoing access to the band for the duration of that licence. This helps mitigate risk to continuity of consumer services.

### Risks

* The auction of the remaining two 2 x 5 MHz lots is heavily constrained given that each lot is only likely to be bid on by the neighbouring licensee. Therefore, the auction outcome may not be reflective of the full market demand for 900 MHz spectrum.
* This option continues the ‘fragmented’ nature of spectrum holdings in the band, as each incumbent licensee will obtain 2 x 5 MHz in the band. While the intermediate blocks (blocks 2 and 4) could still be offered in a combined allocation with the 850 MHz expansion band, the efficiency gains associated with an incumbent licensee exiting the 900 MHz band in favour of the 850 MHz expansion band may not be realised.[[12]](#footnote-13)
* It is more complex to allocate the 2 x 1 MHz that is below the 850 MHz spectrum licences under the hybrid option. The options for allocating the 2 x 1 MHz under this option are either via auction in the same process as the remaining 900 MHz lots/850 MHz expansion band (but as a separate lot), or via direct allocation.
* Pricing the converted spectrum licences may be challenging, given the inherent uncertainty associated with the value of spectrum. However, the ACMA notes that recent allocations of sub-1 GHz spectrum may offer useful price comparisons. Nevertheless, there is expected to be some pricing complexity resulting from the heterogeneity within the band.

## Downshift in the 850 MHz spectrum licences

The addition of a 1 MHz guard band between the 850 MHz band base-transmit segment and the 900 MHz base-receive segment will significantly increase the usability of the lower segment in the 900 MHz band. This can be achieved via a downshift of the existing 850 MHz band spectrum licences[[13]](#footnote-14), and as such, could only occur prior to 2028 with the consent of the spectrum licensees in question (Telstra and VHA).

[*The ACMA’s long-term strategy for the 803–960 MHz band decision paper*](https://www.acma.gov.au/theACMA/review-of-the-803-960-mhz-band)set up a clearance process for the two blocks of 1 MHz of spectrum into which the downshift would ultimately occur. The relevant question for the purposes of this paper is the appropriate means by which this 1 MHz can be allocated as a spectrum licence. Allocating this spectrum as a spectrum licence is necessary to remove any regulatory impediments to achieving the downshift.

Under the encumbered auction option, the 2 x 1 MHz could be allocated by appending it to the lower lot in the 900 MHz band, which supports an environment for the market to facilitate the downshift by commercial negotiation. The owner of the lower 900 MHz lot is a beneficiary of the downshift and would be able to use the 2 x 1 MHz in negotiations with 850 MHz spectrum licensees to facilitate the downshift.

Under the Hybrid option, the allocation of the 2 x 1 MHz is more complex. The options for allocating 2 x 1 MHz would be either via auction in the same process as the remaining 900 MHz lots/850 MHz expansion band (but as a separate lot), or via direct allocation.

## Summary

The ACMA considers that the encumbered auction option is the approach that best meets the objectives of the reform, and also is more likely to achieve the broader policy objectives.

The hybrid option is likely to improve upon the status quo, given that it will increase investment certainty and facilitate a reconfiguration to efficient bandwidths. Nevertheless, the hybrid option is considered to be suboptimal relative to the encumbered auction.

The following table presents a summary of the ACMA’s view of whether each option achieves the 900 MHz-specific objectives outlined above.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Status quo | Encumbered auction | Hybrid option |
| Spectrum licensed? | ✖ | ✔ | ✔ |
| Facilitate downshift? | ✖ | ✔ | **? [[14]](#footnote-15)** |
| 5 MHz configuration? | ✖ | ✔ | ✔ |
| Market price? | ✖ | ✔ | ✖ |
| Enable licensees to mitigate risks to consumer services? | ✔ | ✔ | ✔ |
| Enables move to larger bandwidth? | ✖ | ✔ | ✖ |

**Consultation questions:**

1. Are the reform options presented in this paper appropriate, and are there any implementation issues or suggestions that haven’t been identified?
2. Stakeholders raised concerns that the mid-2021 clearance date will result in consumer service discontinuity; does the proposed mid-2024 clearance date provide enough time to create an alternative pathway for the deployment of services at risk?
3. Can stakeholders provide up-to-date information on consumer migration to 4G compatible handsets, including estimates of the numbers of consumers yet to migrate, and information on the timing and speed of consumer migration?
4. The encumbered auction option includes an approach whereby incumbent apparatus licences and spectrum licences would potentially ‘overlap’. Do stakeholders have any concerns with this approach being employed in this context?
5. Are there any issues associated with the hybrid option that raise any concerns for stakeholders?
6. Are there any other mitigation techniques that will see the reconfiguration of the band into 5 MHz configuration whilst mitigating risks to consumer services?

# Timing considerations

Both the encumbered auction option and the hybrid option require that spectrum be allocated via price-based allocation. The Draft *five-year spectrum outlook 2019–23* (FYSO) forward allocation scenarios outlined the feasibility of allocating 850 MHz/900 MHz at the same time as 26 GHz. The potential timing of the allocations is presented in the Table 1.

1. Potential timing of allocations (note: Consistent with the FYSO, dates are in financial years)

| Band | ACMA planning decision | Minister decision where applicable | Allocation/Auction |
| --- | --- | --- | --- |
| **26 GHz** | Q4  2018–19 | Q1 2019–20 | Q1/2 2020–21 |
| **850/900 MHz** | Q2 2017–18 (planning decision- complete)  Q4 2018–19 (configuration options 900 MHz) | Q1/2 2019–20 | Q1/2 2020–21 |

The key dates in the availability of the 850 MHz expansion band are a driver for the ACMA’s thinking on preferred allocation timing. The proposed implementation process makes large parts of the band available from the key milestone date of 30 June 2021, while the whole band is available from 30 June 2024. The ACMA considers that allocation of the 850 MHz band should occur prior to the 2021 key milestone date in the 850 MHz implementation process in order to avoid valuable spectrum remaining unused.

The ACMA is aware there are discussions underway regarding the allocation of spectrum for a PSMB capability. The Australian Government has agreed to set aside 2 x 5 MHz of spectrum in the 850 MHz expansion band for this capability.

At the 12 December 2018 meeting of COAG, leaders took a significant step towards achieving a federated national PSMB capability. All jurisdictions agreed a strategic roadmap that sets out a plan to design, implement and operate PSMB and to continue to work together to resolve the supporting spectrum arrangements in parallel with proof of concept trials. In December 2018, the NSW Telco Authority on behalf of all jurisdictions issued a request for proposal from the telecommunications industry, to support a proof of concept for trial of a national PSMB capability.

The outcomes of these trials may be considered as an input into the decision over lot location for the spectrum used for a PSMB capability. It is expected that the other spectrum lots in the band, which would be at the top or bottom of the band, would be put to market.

Resolution of this issue may influence the allocation of the 850 MHz band. If there is a delay in the allocation of the 850 MHz band, it may be preferable to progress the reconfiguration of 900 MHz independently of the allocation of the 850 MHz expansion band.

It should be noted that there are additional timing requirements for the Hybrid option. This option requires conversion of three 900 MHz apparatus licences to spectrum licences, along with the auction of two 2 x 5 MHz lots (along with spectrum available in the 850 MHz expansion band). The conversion of apparatus licences to spectrum licences requires that the pricing for the converted licences be administratively determined (as opposed to via auction). Pricing may be challenging, given the inherent uncertainty associated with the value of spectrum. As a result, there is a risk that this approach may lead to an extended process.

**Consultation questions:**

1. The ACMA may progress reconfiguration of 900 MHz independently of the allocation of the 850 MHz expansion band. Does this change the view on the optimal approach to reconfiguration?
2. The ACMA is aware that due to public safety mobile broadband (PSMB) negotiations there is a request to set aside 2 x 5 MHz of spectrum for a PSMB network. While the lot location for this spectrum in the 850 MHz expansion band has not been identified, it is expected that the remaining blocks at the top or bottom of the band would be put to market. Do stakeholders have a view on the relative technical efficiency of the remaining blocks of spectrum for carrier services?
3. The *Five-year Spectrum Outlook 2018–22* (FYSO) forward allocation scenarios outlined the feasibility of allocating the 850 MHz expansion band and 900 MHz band at the same time as 26 GHz band, which would be in Q1/2 2020–21. Do stakeholders have a view on the timing of the proposed allocations?

# Invitation to comment

## Making a submission

The ACMA invites comments on the issues set out in this discussion paper.

* [Online submissions](http://www.acma.gov.au/theACMA/Consultations/Consultations) can be made via the comment function or by uploading a document. Submissions in Microsoft Word or Rich Text Format are preferred.
* Submissions by post can be sent to:

The Manager

Economic Advisory Section

Spectrum Allocations Branch

Australian Communications and Media Authority

PO Box 13112

Law Courts PO

Melbourne Vic 8010

**The closing date for submissions is COB, Friday 24 May 2019.**

Consultation enquiries can be emailed to Economics.AdvisorySection@acma.gov.au

Publication of submissions

The ACMA publishes submissions on our website, including personal information (such as names and contact details), except for information that you have claimed (and we have accepted) is confidential.

Confidential information will not be published or otherwise released unless required or authorised by law.

Privacy

[*Privacy and consultation*](https://www.acma.gov.au/theACMA/About/Corporate/Accountability/privacy-and-consultations) provides information about the ACMA’s collection of personal information during consultation and how we handle that information.

Information on the *Privacy Act 1988* and the ACMA’s privacy policy (including how to access or correct personal information, how to make a privacy complaint and how we will deal with the complaint) is available at [acma.gov.au/privacypolicy](http://www.acma.gov.au/privacypolicy).

1. [*Reconfiguring the 890–915/935–960 MHz band: Way forward*](https://www.acma.gov.au/Industry/Spectrum/Spectrum-projects/800-and-900-MHz-bands/~/link.aspx?_id=E2F6ECED7CB9499BA278A7CBC6D1A33F&_z=z), page 30. October 2017 [↑](#footnote-ref-2)
2. While this paper is primarily about the reconfiguration of the 900 MHz band, it is worth noting that the ACMA has identified (and is progressively clearing) spectrum in the 850 MHz band (809–824/854–869 MHz) with a view to creating up to 2 x 15 MHz of harmonised mobile broadband spectrum referred to as the 850 MHz expansion band. This spectrum (which will become available for use progressively between 2021 and 2024) offers an opportunity for combined 900 MHz/850 MHz allocation which may help avoid fragmentation of (and by extension, inefficiency in) sub-1 GHz spectrum holdings. [↑](#footnote-ref-3)
3. For example, a likely configuration would involve a spectrum licence for the lower block (block 1) being issued to Telstra, for the middle block (block 3) to Optus, and the upper block (block 5) to Vodafone. [↑](#footnote-ref-4)
4. Notably, this option may still result in the allocation of the 2 x 1 MHz (and thereby facilitate the downshift), but it is more complex as it means the 2 x 1 MHz must be allocated as an independent lot in the same process as the 900 MHz/850 MHz expansion band allocation or be allocated directly. [↑](#footnote-ref-5)
5. More technical analysis was included in the [*Reconfiguring the 890–915/935–960 MHz band* consultation paper.](https://www.acma.gov.au/Industry/Spectrum/Spectrum-projects/800-and-900-MHz-bands/reconfiguring-the-890-915-935-960-mhz-band) [↑](#footnote-ref-6)
6. The object of the *Radiocommunications Act 1992* is to provide for management of the radiofrequency spectrum, to achieve the goals set out in paragraphs 3(a) to 3(h). [↑](#footnote-ref-7)
7. The allocation of a spectrum licence covering the 2 x 1 MHz that is below to the current 850 MHz band removes a regulatory impediment that is potentially precluding the commercial agreement necessary to achieve the timely downshift of the 800 MHz spectrum licences, which is necessary to enhance the usability of the lower lot of the 900 MHz band. This is detailed further in the Optionssection of this document. [↑](#footnote-ref-8)
8. The other option canvassed by the ACMA during this process is referred to as the ‘conversion option’, which involves simply converting the 900 MHz apparatus licences into spectrum licences in their current configuration, which may enable licensees to trade into the efficient bandwidth configuration. This approach, as opposed to the more preferred options, is not guaranteed to result in the reconfiguration of the band, which is a key objective of the reform. [↑](#footnote-ref-9)
9. For example, a likely configuration would involve a spectrum licence for the lower block (block 1) being issued to Telstra, for the middle block (block 3) to Optus, and the upper block (block 5) to Vodafone. [↑](#footnote-ref-10)
10. A delay in auction timing would potentially reduce the time available for licensees to mitigate risks to consumer services. [↑](#footnote-ref-11)
11. The owner of the lower 900 MHz lot is a beneficiary of the downshift and would be able to use the 2 x 1 MHz in negotiations with 850 MHz spectrum licensees to facilitate the downshift. [↑](#footnote-ref-12)
12. It is possible that, post-auction, an incumbent licensee may trade their 900 MHz holdings to a competitor, which may result in each licensee holding wider contiguous bandwidths. [↑](#footnote-ref-13)
13. See Chapter 4 of [*The ACMA's long term strategy for the 803–960 MHz band*](https://www.acma.gov.au/-/media/Spectrum-Licensing-Policy/Information/Word-Document/The-ACMAs-long-term-strategy-for-the-803960-MHz-band_decision-paper-docx.docx?la=en) for details on why this is an important reform. [↑](#footnote-ref-14)
14. It is worth noting that this option may still result in the allocation of the 2 x 1 MHz (and thereby facilitate the downshift), but it is more complex as it means the 2 x 1 MHz must be allocated as an independent lot in the same process as the 900 MHz/850 MHz expansion band allocation or be allocated directly. The former opens the risk that a party other than those involved in the downshift may purchase the lot, which would make the negotiations necessary to facilitate the downshift more complex. [↑](#footnote-ref-15)