



ACCC Regional Mobile Infrastructure Inquiry

nbn submission

8 August 2022

Public version



Introduction

Thank you for the opportunity to comment on the issues set out in the 'Regional Mobile Infrastructure Inquiry Consultation Paper, 1 July 2022'.

nbn's consideration of communications towers is focused on supplying fixed wireless (**FW**) broadband services, ensuring **nbn** meets the Government's Statement of Expectations, the Statutory Infrastructure Provider (**SIP**) obligations, and our role as the default SIP for Australia. This includes the Federal Government's expectation that **nbn** will assist in reliably and affordably meeting the current and future broadband needs of households and businesses, including in regional and remote areas of Australia, and will continue to upgrade the network technologies to support Retail Service Providers (**RSPs**) to meet demand from end-users and improve customer experience.¹ **nbn** does not supply mobile carriage services using its communications towers or FW network.

nbn's FW network currently comprises approximately 2,400 sites in rural, regional and outer-metro fringe areas, with the initial build all but completed. We estimate that approximately [C-i-C] [C-i-C] new/replacement sites per year will be required [C-i-C] [C-i-C]. In addition, the upgrade paths for the FW network are regularly reviewed to improve the customer experience. This has implications for **nbn's** use of existing sites, with upgrades introducing new technology to improve performance generally every year or two.

nbn has created a dedicated fund to co-invest with governments and local councils to continue to enhance broadband services for Australia's regional and remote communities.² In addition, the Federal Government recently announced a \$750m investment for **nbn's** FW network, comprising a Federal Government contribution of \$480m and \$270m by **nbn**. This will allow **nbn** to fast-track an uplift of the performance of the FW network. **nbn** will use the latest 5G technology to vastly extend the range, speed and capacity of its existing FW network, while reducing latency, to deliver the best possible customer experience. Importantly, as a result of recent advances in 5G technology, and in particular **nbn's** extensive testing and future implementation of 5G millimetre wave technology, the enhancements will be delivered primarily using the existing network of **nbn** FW towers.³

nbn's FW network is loss-making

The Department of Communication's Bureau of Communications Research (**BCR**) determined that **nbn's** FW network is loss-making and non-commercial. In 2015, it estimated that the net present value (**NPV**) loss for FW and satellite services to FY2040 was approximately \$9.8 billion, using a post-tax nominal discount rate of 6.46%. In FY2015 real terms, this loss represented a per-month subsidy of approximately \$105 for each FW premises activated.⁴

In 2020, using BCR's financial model and methodology, the ACCC prepared updated estimates of the financial losses associated with **nbn's** FW and satellite networks. The revised estimated NPV of total expected losses (i.e. losses between 1 July 2009 and 30 June 2040) was \$12.949 billion.⁵

¹ NBN Co Limited Statement of Expectations, 26 August 2021.

² NBN Co Limited Corporate Plan 2022, page 13.

³ **nbn** media statement, '\$750 million investment to 5G-enable **nbn** Fixed Wireless to deliver faster speeds to regional Australia', 22 March 2022.

⁴ BCR, 'NBN non-commercial services funding options: Final report', March 2016.

⁵ ACCC, 'Report on modelling of the Regional Broadband Scheme levy initial base component', October 2020, page 15.



Given the loss-making and non-commercial nature of the FW network, it is unlikely that the services offered by **nbn** using its FW network across the entire footprint, including rural, regional and outer-metro fringe areas, would be offered under a normal competitive environment.

nbn's use of towers for its FW network

The supply of broadband services over **nbn**'s FW network involves data transmitted by radio signals to premises connected to the **nbn** network. Data travels from **nbn**'s radio frequency antennas located on a tower, to a **nbn** outdoor antenna fitted to end-users' premises. The operation and upgrade of **nbn**'s FW network therefore relies on access to tower sites across **nbn**'s FW footprint, which includes metro-fringe, regional and rural areas of Australia.

Approximately 70% of **nbn**'s ~2,400 sites are **nbn**-owned tower structures. The remainder [C-i-C] [C-i-C] are co-locations on towers owned by:

- Axicom;⁶
- Amplitel (with a 51% shareholding by Telstra);⁷
- Australia Tower Network (**ATN**) (an Optus and AustralianSuper joint venture);
- BAI Communications (**BAI**); and
- TPG/VHA.

Other entities with whom we have co-location arrangements include Vertel, Win TV, power authorities, and local councils.

Following the completion of the capital-intensive build phase of **nbn**'s FW network, operating costs contribute an increasing proportion of overall expenses for the network, driven largely by site rental and maintenance costs.⁸

Types of towers and spectrum used

nbn's FW transmission towers are built in chains connected to each other through microwave links, with the hub transmission tower connected directly to an exchange via fibre.

Across the ~2,400 sites, radio coverage and fibre hub sites make up approximately [C-i-C] [C-i-C] respectively, with the balance [C-i-C] [C-i-C] made up of repeater sites. In this context:

- Radio coverage sites are those which have a direct wireless connection from antennas on the tower to end-users via a roof-mounted subscriber dish. These sites are connected to the rest of the FW network via microwave transmission dishes.

⁶ In April 2022, Australian Tower Network announced it had agreed to acquire Axicom. See: [AustralianSuper, Singtel and Australia Tower Network to acquire Axicom](#).

⁷ Brendon Riley, 'Introducing Amplitel, the largest mobile infrastructure provider in Australia', 1 September 2021. See: <https://exchange.telstra.com.au/introducing-amplitel-the-largest-mobile-infrastructure-provider-in-australia/>.

⁸ BCR, 'NBN non-commercial services funding options: Final report', March 2016, Figure 3: Fixed wireless opex breakdown, FY2011–18.



- Like radio coverage sites, fibre hub sites typically have a direct wireless connection to end-users and microwave transmission to other FW sites, but importantly they also have a fibre connection to a nearby exchange which allows all sites in the chain to access the **nbn** fibre network.
- Repeater sites do not have a connection to end-users. They are designed to provide microwave transmission between FW sites only, in situations where this is needed due to surrounding topography.

The costs of establishing new towers are discussed in detail below. We note that these costs may be slightly lower for repeater sites, but they are generally similar regardless of the type of tower being built. This is because costs are largely driven by things like power and access requirements, and these do not differ based on the type of tower involved. Third parties are able to co-locate on any type of **nbn** tower.

nbn uses its 2.3 GHz and 3.4 GHz band spectrum holdings, with upgrade plans accelerated by the \$750 million FW network investment expediting the deployment of its recently acquired 28GHz band holdings. **nbn** also uses point-to-point apparatus licences across a range of bands as microwave links.

Tower site selection process

Below, we have provided details about the range of considerations generally relevant to the selection of a tower site, based on **nbn**'s experience. We would expect these considerations to be similar for all telecommunications network providers (including mobile network operators (**MNOs**) and other FW network operators).

The considerations involved in an own-build generally include:

- Technical ability to meet network service objectives. This involves consideration of antenna heights and positioning relative to end-users, line-of-site for backhaul using microwave transmission and/or location of the nearest fibre optic connection point.
- Estimated delivery timeframes, including those associated with contractual arrangements with the landowner and planning approvals.
- The site acquisition risk, including being able to readily secure property and town planning approvals, which involves consideration of council and community attitudes.
- The ability to secure long-term tenure.
- Initial build costs including provision of mains power.
- Operational costs including rental arrangements with landowners.

In assessing the suitability of a co-location as opposed to an own-build, relevant considerations include:

- The technical capabilities of a site to meet a carrier's network requirements. This includes the location of the site and the location of equipment on the tower (i.e. height and aspect). **nbn**'s experience has been that, in a regional context, many existing towers simply do not offer enough height to meet **nbn**'s FW technical requirements. In regional locations, it is generally desirable to be as high as possible to extend the range of the signal and/or ensure line-of-site microwave connections with neighbouring sites. Typically, if an existing tower is ~50m high and there are two operators in place, there is generally no space for our equipment higher than ~40m. A difference of 10m in height could result in 5-10km less radial coverage.



- Co-locations have a lower site acquisition risk than own-builds (notwithstanding that planning approvals may still be relevant), given the existing nature of the tower structure. Timeframes for deployment are often shorter as well. Co-locations can, however, involve upfront costs for structural upgrades / strengthening (which can be expensive), and ongoing opex costs are also higher due to site sharing fees.

As noted above, generally speaking, one of the main considerations for telecommunications network providers in assessing potential sites for own-builds or co-locations is the technical capability of the site, determined by the location of the site and the location of equipment on the tower (i.e. height and aspect). In this regard, we note the locations of **nbn**-owned towers have been determined based on their ability to provide end-users with a service on **nbn**'s FW network:

- Given the loss-making nature of **nbn**'s FW network, we would not expect **nbn**'s FW end-users to be serviced by any other FW network operator under a normal competitive environment. Therefore, we would generally expect low levels of interest from other FW network operators to obtain access to **nbn**'s towers, and this has been our experience to date.
- We expect site selection by MNOs would be driven first and foremost by their own mobile network requirements rather than any FW offering (based on their existing FW offerings). This is notwithstanding that a MNO's technical ability to offer a FW service using its mobile network infrastructure would improve the commercials associated with both their mobile network and FW offering.

We note that, for a telecommunications network provider building its own tower, there is generally no financial incentive to build a tower that could provide physical capabilities significantly above and beyond that estimated to be required, informed by the network provider's own existing and planned needs and any anticipated co-location applications. To do otherwise would significantly increase deployment costs with no guaranteed return on investment, making deployment less cost effective (noting that, for **nbn**, this would mean exacerbating the loss-making nature of our FW network). In comparison, we note that, for an infrastructure provider, the sole purpose of a tower is to generate revenue, given they do not use towers for their own network purposes.

Given the age of tower structures across industry generally, the existing physical capabilities of towers and the commercially negotiated arrangements regarding any potential upgrades are increasingly relevant in both providing, and obtaining, access.

nbn's legal obligations to provide access to its towers and tower sites

nbn and all other carriers are legally obliged to provide carriers with access to their towers and tower sites under the Facilities Access Regime.⁹

Unlike other carriers, **nbn** is also legally required to provide emergency services organisations (**ESOs**) with access to its towers (and associated sites and facilities), to allow the ESOs to install, maintain, operate or remove equipment.¹⁰

⁹ *Telecommunications Act 1997 (Telco Act)*, Schedule 1, Part 5.

¹⁰ *National Broadband Network Companies Act 2011 (NBN Companies Act)*, Part 2, Division 2, Subdivision BA.



Access to nbn sites under the Facilities Access Regime

The Facilities Access Regime requires access to be provided to carriers on a negotiate-arbitrate basis. Relevantly, the carrier as tower owner must give the other carrier access to its towers (including their sites) on such terms and conditions as are agreed between the parties, subject to any mandatory requirements under the ACCC's Facilities Access Code. Failing that, the tower owner and other carrier can appoint an arbitrator (including the ACCC) to arbitrate and determine the terms and conditions on which access is to be provided.¹¹ This framework provides more flexibility to the parties in negotiating and agreeing the terms and conditions of access. nbn has not made any requests for arbitration, or otherwise been involved in any arbitrations, under the Facilities Access Regime.

[C-i-C] [C-i-C].¹² [C-i-C] [C-i-C]

[C-i-C] [C-i-C]

[C-i-C] [C-i-C]

Access to nbn sites for ESOs

As noted above, nbn is required to provide ESOs with access to its towers (and associated sites and facilities) under the NBN Companies Act.¹³

Under the ESO regime, nbn is required to publish a standard offer (i.e. terms and conditions of access) to provide ESOs with access to nbn owned or operated towers, and associated sites and facilities, in certain circumstances. At a general level, the circumstances that must be considered in relation to the provision of access include the following:¹⁴

- access must be for the sole purpose of enabling a person to install, maintain, operate or remove equipment;
- nbn needs to be reasonably satisfied that it would not be reasonable for the person to access another tower not owned or operated by nbn 'in the vicinity' of the nbn tower; and
- nbn must be satisfied that installation of any equipment is 'technically feasible' (with set criteria).¹⁵

[C-i-C] [C-i-C].¹⁶

¹¹ Telco Act, section 36(1)-(2) of Schedule 1.

¹² [C-i-C] [C-i-C]

¹³ NBN Companies Act, Part 2, Division 2, Subdivision BA.

¹⁴ NBN Companies Act, section 19A.

¹⁵ NBN Companies Act, section 19A(7).

¹⁶ [C-i-C] [C-i-C]



ACCC consultation paper questions

We have provided responses to some of the ACCC's questions below.

nbn does not provide a mobile network or temporary mobile roaming services. As such, we have not responded to the questions related to mobile roaming during natural disasters and other emergencies, other than to provide some information in response to question 28 regarding **nbn's** temporary network infrastructure, which helps keep end-users connected during natural disasters.

Access to towers and associated infrastructure

1. What are the typical costs incurred in providing telecommunications towers and associated infrastructure? Can you quantify these costs by providing examples?

The typical costs incurred in installing new telecommunications towers and associated infrastructure generally fall within the following categories:

1. radio and transmission planning relevant to network design;
2. site acquisition costs;
3. civil construction costs including tower fabrication/delivery and mains power connection;
4. equipment and installation costs for radio transmission equipment and antennas;
5. backhaul costs to connect sites into the wider network, which could include point-to-point apparatus licences (which involves spectrum), fibre optic connection to sites, and/or fibre optic line rental from a third party; and
6. operational costs including site rental to landowners and electricity.

The typical costs incurred in establishing a co-location would generally fall within similar categories, with licence fees payable to tower owners and, in many circumstances, additional site rental payable to landowners as well. As noted below, co-location structures may also require strengthening, which can be expensive and may mean a new structure is more cost effective.

For a **nbn**-owned tower, site establishment costs for the first four categories (combined) typically range from approximately [C-i-C] [C-i-C]. For a co-location site, establishment costs typically range from approximately [C-i-C] [C-i-C]. However, there have been isolated cases of both **nbn**-owned towers and co-locations exceeding [C-i-C] [C-i-C] in site establishment costs. The key cost variables include:

- transportation of personnel and equipment to the site, with higher costs for more isolated or difficult-to-reach locations;
- power connection costs;
- access track costs;



- community engagement exercises and environmental approvals costs, particularly where proposals have been subject to legal appeals; and¹⁷
- for co-location sites, tower strengthening – a large percentage of existing towers are at capacity, with additional structural load requirements potentially requiring strengthening (or even replacement) of the tower/pole, which can be very expensive (in some cases in excess of [C-i-C] [C-i-C]).

There are also costs incurred when, during the planning phase, planning approvals are not forthcoming or landowners subsequently decide not to proceed. This can occur at an advanced stage, which results in significant costs being incurred, and the need to pursue alternative locations.

Backhaul costs can be high, in terms of both initial establishment and ongoing operational costs. We have had cases where the cost to establish fibre backhaul has been over [C-i-C] [C-i-C]. We expect MNOs with large fibre footprints like Telstra face correspondingly lower backhaul costs compared to nbn, given nbn is required to establish its own fibre connections to sites, to rely on third party fibre, or to rely on microwave links (which involves point-to-point apparatus licence fees).

Operational costs in terms of site rentals and tower licence fees in general terms are as follows:

- [C-i-C] [C-i-C]
- [C-i-C] [C-i-C]

2. What costs are involved (for example, in setting up and maintaining) business practices and systems needed to support the provision of access to towers and associated infrastructure?

The relevant costs for nbn include the application management tool set up approximately 10 years ago, and personnel resources. The personnel resources include a dedicated inbound team of three full-time employees who manage the review of applications from third parties (including to co-locate at new/additional sites and to upgrade equipment at existing sites), the required technical assessments, the coordination with applicants and with other internal business units as relevant, and the ongoing management of contractual arrangements, along with other tasks.

The other internal business units engaged on a regular basis include the Acceptance and Field Operations units (relevant to technical requirements), and Billing (relevant to invoicing). Other business units engaged on a more occasional basis include the Portfolio Projects, Site Acquisition, Property, and Change Management teams, generally for other technical assessments on a case-by-case basis.

Our view is that the costs involved in setting up and maintaining business practices and systems to support the provision of access to towers and associated infrastructure would be quite variable across different types of tower owners. For some entities (e.g. infrastructure owners who do not operate a telecommunications network), the provision of access to towers and associated infrastructure would be their core business and the large volumes / scale could assist in reducing their relative costs.

¹⁷ We note our understanding that, under the Mobile Blackspots Program, carriers sometimes have exemptions from certain planning processes, which may result in significant cost savings.



3. What costs are involved in accessing land required for the establishment and operation of telecommunications tower infrastructure? Do these fees differ depending on the owner of the land (for example, public v private ownership)?

At a general level, the costs involved in accessing land fall into the following categories:

- commercial negotiations;
- initial site identification and assessment;
- property approvals (leases/licences/tower-sharing approvals);
- town planning notifications/approvals; and
- design engineering including tower design, power connection design, and access track design.

While it does differ between the different states and territories, access costs are typically higher for publicly-owned land than privately-owned land, due to the need to engage with multiple agency approval processes and the timeframes associated with obtaining approvals. There are also common additional requirements such as environmental / cultural heritage assessments and Native Title considerations.

Tenure agreements with public authorities often involve more lengthy negotiations to reach agreement, and are typically more onerous in relation to operational constraints. For example:

- NSW National Parks and Wildlife Service charges additional fees for legal and administrative costs of preparing the lease. Their leases may require users to contribute to track maintenance and weed control costs.¹⁸
- Many Crown land agreements require full consent processes for equipment upgrades and approvals for simple maintenance access, which is typically not required with private lessors. As an example, we note [C-i-C] [C-i-C].

4. What are the typical commercial arrangements for access to towers and associated infrastructure?

When **nbn** accesses a third-party tower (whether owned by a carrier or an independent infrastructure owner), and when **nbn** provides access under the Facilities Access Regime or the ESO framework, the usual practice is for a master agreement or a single site agreement to be entered into, setting out the access terms and conditions and associated pricing. A master agreement is used for larger site volumes; a single site agreement is used for smaller site volumes or for other ad hoc arrangements.

For each **nbn** site to which we provide access, we use a standard L1-6 co-location process. This generally involves the following steps:

1. **Request for preliminary information:** This involves providing preliminary information from the tower operator to the requestor for a specific site.

¹⁸ See IPART, 'Final Report - Review of Rental Arrangements for Communication Towers on Crown Land', November 2019 for further details relevant to NSW.



2. **Request for approval in principle:** This involves a general description of the proposal including brief scope of works, schedule of works, preliminary drawings, details of proposed equipment to be installed, and site photos.
3. **Request for detailed design approval.**
4. **Request for commercial agreement:** This includes details on whether landlord approval is required to grant a licence/sublease and approvals provided by other occupiers on the structure or in the queue.
5. **Request for construction access.**
6. **As built pack:** This includes structural certificates for example.

Traditionally, pricing has been based on the cost-per-equipment. For example, [C-i-C] [C-i-C]. The costs for each item of equipment are added together to give an annual licence fee, with a minimum annual fee typically applicable. [C-i-C] [C-i-C]

We have observed that, over the past couple of years, other tower operators have been moving to an Effective Sail Area (ESA) pricing model. An ESA can be used to determine the structural impact of an equipment configuration on a structure (with reference to matters such as direct load, torsional behaviours, and environmental conditions for example). [C-i-C] [C-i-C] This pricing model allows for greater flexibility – an incoming party usually pays for a ‘band’ and can therefore deploy equipment up to the top of the band without incurring additional costs. ESA pricing is, however, a relatively new concept and is likely to be defined and implemented differently by different tower owners according to their own inputs and variables.

The terms and conditions on which nbn offers access to ESOs [C-i-C] [C-i-C] includes an annual equipment charge, based on the price per item of equipment.¹⁹ [C-i-C] [C-i-C]

Other costs associated with site deployment are managed between parties on a site-by-site basis. This includes the costs related to any strengthening work that may be required to increase the structural load-bearing capacities of the towers, noting the general age of tower structures in the market.

Where two carriers have an interest in a new site, they may enter into a co-build arrangement. [C-i-C] [C-i-C]

5. What role do specialist entities such as land aggregators, both commercial and government, play in acquiring access to land or the sites of towers?

nbn has not engaged with commercial land aggregators in acquiring access to land or tower sites. We are not aware of / have not engaged with government land aggregators operating in the telecommunications industry.

Commercial lease aggregators typically assume a passive role, seeking to generate revenue from purchasing long term rental income streams from underlying landowners. Aggregators generally negotiate a deed of assignment or concurrent lease with landowners of existing telecommunications sites. This gives the aggregator the right to collect the rent from the site operator for a specified period (which can range from five to 99 years). The landowner is usually paid a lump sum at commencement that is less than the remaining rent payable under the

¹⁹ Terms and conditions of access for ESOs, and price terms for ESOs, are available at: <https://www.nbnco.com.au/sell-nbn-services/products-services-pricing/eso-access>.



lease, thereby providing the aggregator with a margin based on current and future rent. There is no involvement from the aggregators in site access, maintenance, or other operational matters relating to tower sites.

6. Are there any other considerations that contribute to / determine these commercial and other fee arrangements for access to towers and other infrastructure?

See our answer to question 4 above.

For co-locations on private land, **nbn** often enters into direct ground rental arrangements with the landowner, with additional rent payable. **nbn** may choose to do this because it provides a direct relationship with the landowner.

For co-locations on public or government-owned land, additional fees may be imposed on co-users by some government landowners (for example, in respect of NSW Crown land), even where the primary user is already making rental payments and the co-user makes no further encumbrance of the land.

In comparison, under Queensland Crown land arrangements, co-users are typically not required to pay to use areas inside existing carrier compounds, with payment only required for the use of areas outside the primary user's compound. The Queensland Government obtains no monetary benefit when carriers sublease part of their compounds, excluding application fees for example. If a party wants to enter into a co-location agreement with another carrier on a site where the lease is with the Department of Natural Resources, Mines and Energy (**DNRME**), that is permitted, provided the parties enter into a formal sublease on DNRME-approved terms and obtain the relevant Minister's approval.

We also note that, for infrastructure owners (as opposed to telecommunications network providers), tower revenue is their core business which we consider contributes to generally higher-cost commercial arrangements. Further, the business case associated with an infrastructure owner's tower arrangements determines the viability of building new structures, which is increasing in relevance given the ageing portfolio of tower assets generally.

7. What other matters do providers of towers and associated infrastructure consider in deciding to provide towers and/or provide access to towers?

As discussed in the introductory section of this submission, **nbn** is legally obliged to provide access under the Facilities Access Regime (which applies to all carriers including **nbn**) and under the ESO regime. These frameworks govern **nbn**'s provision of access to towers and tower sites.

8. Are current commercial arrangements for access to mobile towers and associated infrastructure effective? If not, why and what could be done to improve their effectiveness?

Under the Facilities Access Regime, we consider that the negotiate/arbitrate framework has been operating effectively. We have successfully reached commercial agreement with parties seeking access to our towers, and with parties to obtain access to their towers, under the Facilities Access Regime. Further, we have not made a request to appoint an arbitrator to arbitrate on tower access, and we have not otherwise been involved in arbitration proceedings under the Facilities Access Regime.

We do note that, in **nbn**'s experience, performing upgrade works at **nbn**-owned sites is generally more time effective than performing these works at co-location sites owned by third parties, reflecting the efficiencies



associated with having fewer parties and approvals involved. For example, co-locations require an application process to be followed as well as structural assessments, which typically takes at least five to nine months. If strengthening is required, this timeframe can extend beyond 12 months. Typically, upgrades on a co-location site will also involve an uplift in site sharing fees and new licence documentation. By contrast, when **nbn** performs upgrade works on its own structures, this is typically allowed for under the tenure agreement and can be performed in two to three months (without a fee uplift).

See our answer to question 10 below regarding the recent divestment of towers by MNOs and the implications for commercial arrangements.

9. Are current regulatory arrangements for access effective? If not, why and what could be done to improve their effectiveness?

See **nbn**'s answer to question 8.

10. Has the recent divestiture of tower infrastructure by MNOs impacted on the effectiveness of current commercial and regulatory arrangements? Please provide details and examples.

We do not believe the recent divestiture of tower assets by MNOs will impact our ability to gain access to towers. The new owners rely on business from **nbn** and other entities, and are therefore incentivised to reach agreement with parties to allow co-location on their structures. The divestment of tower infrastructure by the MNOs does, however, mean that some of our co-location agreements will change.

[C-i-C] [C-i-C]

As noted above in response to question 6, infrastructure owners generally have a greater focus on tower revenue, given it is their core business. [C-i-C] [C-i-C]

[C-i-C] [C-i-C]

[C-i-C] [C-i-C]

11. What costs do providers of towers and associated infrastructure incur in providing active and/or passive mobile infrastructure? Can you quantify these costs?

Depending on the circumstances, there may be costs in the following categories:

- temporary or permanent equipment relocation to accommodate an incoming carrier's requirements;
- access track maintenance/upgrades.

12. How does the cost of providing new, or upgrading existing, mobile tower (both active and passive) infrastructure impact the decision to invest in infrastructure that can be used to supply mobile telecommunications and other radiocommunications services?

nbn is required to provide a FW network which uses communications towers to meet the Government's Statement of Expectations, our obligations under the SIP regime, and our role as the default SIP for Australia.



We also note that **nbn**'s investment / expenditure needs to be prudent and efficient, under the Special Access Undertaking (**SAU**) for example.

See **nbn**'s discussion in the introductory section (under the headings 'nbn's use of towers for its FW network' and 'Tower site selection process') for further discussion regarding the use of towers as part of **nbn**'s FW network and considerations relevant to selecting a tower site, including own-build and co-location considerations.

13. How does the cost of access to mobile towers impact the decision to provide access to mobile telecommunications and other radiocommunications services?

As discussed in the introductory section, **nbn** is legally obliged to provide access under the Facilities Access Regime (which applies to all carriers including **nbn**) and under the ESO regime. These frameworks govern **nbn**'s provision of access to towers and tower sites.

14. Are there additional costs specific to rural, regional, remote or peri-urban areas?

While not specific to rural, regional, remote or peri-urban areas, there are a number of cost factors that can be magnified in these areas. These costs include establishment of access tracks, connection to the power grid, and mobilisation (i.e. deploying personnel to the site), owing to the more remote nature of site locations.

Transmission backhaul is also a key constraint requiring expensive fibre spurs to sites or line-of-site microwave links, with the availability and cost of point-to-point apparatus (spectrum) licences a relevant consideration.

15. What are the implications of MNOs divesting their tower assets on the current commercial and other fee arrangements for access to towers? How have these changed as a result of the divestment of tower assets by MNOs? Do you expect these to further change in the future and why?

See **nbn**'s answer to question 10.

16. How has the recent divestment of tower infrastructure by MNOs impacted:

- (i) the scope of access offered
- (ii) the terms and conditions of access, and
- (iii) the commercial and other fee arrangements for access.

See **nbn**'s answer to question 10.

As a general comment, we do not expect the scope of access to diminish or be removed.

19. To what extent will the matters raised in the consultation paper impact, or be impacted by, the extension of 5G coverage?

As noted in the introductory section above, **nbn** will use the latest 5G technology to extend the range, speed and capacity of its existing FW network, while reducing latency, to deliver the best possible customer experience. As a result of recent advances in 5G technology, and **nbn**'s testing and future implementation of 5G millimetre wave technology, the enhancements will be delivered primarily using the existing network of **nbn** FW towers.



More broadly, we note that, as with the introduction of previous technology evolutions, it is anticipated that there will be additional demand for apertures and/or structural loading on existing telecommunications network structures. This will magnify existing physical constraints on the ability of network operators to co-locate, and increase the likelihood of structural upgrades if co-location is possible.

Mobile roaming during natural disasters and other emergencies

28. What alternative solutions (other than temporary mobile roaming) could be considered to improve network resilience during or after a natural disaster or other emergency?

nbn does not provide a mobile network or mobile roaming services. While this question specifically refers to network resilience, we understand that the ACCC would like to hear about other measures, such as battery backup, that might provide alternative forms of communication to temporary mobile roaming during natural disasters or emergencies. In this respect, **nbn** has a diverse range of temporary network infrastructure (**TNI**) that helps keep end-users connected to **nbn**'s broadband network during natural disasters. We have elaborated further on our use of TNI below.

Where it is safe to do so and access is not constrained, TNI can be rapidly deployed to support communities during the relief and recovery phases of emergency management. TNI allows **nbn** to quickly restore broadband services to customers when a network site is badly damaged or destroyed. This kind of equipment replicates the site that was destroyed, and can remain there until we have built a permanent replacement, enabling customers to be connected during the repair / rebuild process.

nbn's TNI encompasses the following:

- Network on Wheels and Wireless on Wheels:
 - A versatile, enclosed trailer containing rack space, cooling, power systems, fibre distribution and devices for a small network exchange that can be towed where needed. It can be quickly deployed to plug a gap in a section of damaged FW or fixed-line technology.
 - A Network on Wheels trailer was successfully deployed at an exchange site damaged during the 2019/2020 bushfires at Diamond Beach in NSW. The trailer remained on-site, keeping residents connected via their RSPs, for six months while infrastructure at the site was being rebuilt.
- Point of Interconnect (**POI**) on Wheels:
 - A semi-trailer-sized, towed vehicle designed to mirror one of **nbn**'s 121 POIs across the nation.
 - Used to temporarily restore services lost due to an outage caused by damage to an exchange that has impacted a POI, resulting in a loss of connectivity for customers.
- Wireless Mast Trailer:
 - A portable trailer with an extendable 18m high mast designed to replicate the equipment on a FW network tower.
 - Used for quick and temporary installation of antennas and microwave radios in an emergency event. The trailer can also be used to boost wireless access point signals if deployed in conjunction with other capabilities, such as a portable satellite flyaway kit.



- Hybrid Power Cube:
 - An environmentally friendly, hybrid technology power generation unit combining solar panels, battery, and a compact diesel generator. It provides solar power to FW hub sites during the day and, for power resilience, relies on excess battery and grid power at night.
 - Used primarily to enable **nbn** FW facilities to operate for up to six months without a power grid connection.
- Multi Tech Trailer:
 - A highly versatile, towable, enclosed trailer designed for rapid deployment to quickly restore connectivity and power to damaged parts of the HFC, FW and FTTN networks.
 - A prototype Multi Tech Trailer was used to restore FTTN services disrupted during the NSW floods at Bulahdelah, reducing the time customers were without connectivity from weeks to hours while repairs were carried out at the site impacted by flooding.²⁰

nbn also provides Disaster Satellite Services which use **nbn**'s Sky Muster satellite to supply, via participating RSPs, a backup connection that can be switched on during an emergency at designated emergency management sites and evacuation centres across the country. **nbn**'s portable satellite infrastructure includes:

- Road Muster trucks: Sky Muster satellite-equipped vehicles that can provide a Wi-Fi connection for emergency workers and evacuated local residents, along with the ability to display important information on external facing LCD screens.
- Portable Satellite kits: These satellite-equipped kits can be transported to areas where no other communications services are available and can provide valuable support to communities and/or emergency services in disaster situations.²¹

²⁰ See <https://www.nbnco.com.au/blog/the-nbn-project/multi-tech-trailer-keeping-customers-connected> for further detail on Multi Tech Trailers.

²¹ See <https://www.nbnco.com.au/corporate-information/media-centre/media-statements/nbn-disaster-satellite-services> and <https://www.nbnco.com.au/blog/the-nbn-project/stand-and-deliver> for further details regarding **nbn**'s Disaster Satellite Services.