

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

- [REDACTED]

- [REDACTED]

- [REDACTED]

[REDACTED]

[REDACTED]

- [REDACTED]

- [REDACTED]

- [REDACTED]

[REDACTED]

- [REDACTED]

• [REDACTED]

2 Provide Telstra's estimate of the total number of FWA services that Telstra could support using the additional spectrum holdings that it will obtain from TPG Telecom Limited pursuant to the Proposed Transaction and any documents that evidence this.

As the ACCC is aware, the MOCN Agreement provides for a certain portion of the pooled 3.6GHz spectrum to be used by Telstra and TPG to supply FWA services in the 17% Regional Coverage Zone.⁶

As FWA services supplied to an individual subscriber's premises consume substantially more spectrum than mobile services used by an individual subscriber (on average up to 20 times more), to avoid any degradation of service quality for mobile customers of either Telstra or TPG, only a portion of the pooled spectrum will be available for FWA.⁷ Under the MOCN Agreement, 40% of the total amount of pooled 3.6GHz spectrum is available for use for FWA services in each cell area, in turn with Telstra's and TPG's services able to use up to 50% of that spectrum each.⁸

In the course of the supply of its own FWA services, Telstra has developed service qualification systems to assess whether a new FWA SIO order should be accepted, and these same rules will be applied on a non-discriminatory basis by Telstra in the supply of FWA services to fulfil its own retail orders and to TPG orders for the wholesale FWA services in the 17% Regional Coverage Zone. These rules, while applied consistently and on a non-discriminatory basis across the 17% Regional Coverage Zone, can mean that the number and density of FWA services will vary from cell to cell depending on a range of objective factors designed to ensure that FWA services' consumption of spectrum does not degrade the Telstra and TPG mobile services.

Within this non-discriminatory spectrum sharing 'envelope', the number of FWA SIOs that the above spectrum volume can support is also dependent on the FWA product constructs that TPG and Telstra plan to introduce independently (i.e. speed and data inclusions).

Accordingly, it is difficult to be precise as to the estimated number of Telstra and TPG FWA services, or for Telstra to estimate the number of its own retail FWA services that the MOCN could support using the additional spectrum holdings.

To assist the ACCC:

- Given the uncertainties around managing FWA and mobile services within the pooled spectrum, the MOCN Agreement provides for a Market Review if [Confidential to Telstra] [REDACTED] are connected to the MOCN (between both parties).⁹
- Beyond the commercial agreements, as a matter of practicality, the maximum number of SIOs that can be supported is determined by factors such as (but not limited to):

⁶ [REDACTED]

⁶ For completeness, Telstra is not authorised to use TPG spectrum in metropolitan areas covering around 0-81.4% of the population, however Telstra can also use this spectrum beyond the 17% Regional Coverage Zone.

⁷ See MOCN Agreement, Annexure A to Schedule 2, clause 1(d): 'To protect the integrity of mobile services, the capacity available for the use of FWA by the End Users of each party within the Coverage Area will be limited as set out in this Annexure'.

⁸ See MOCN Agreement, Annexure A to Schedule 2, clause 1(e).

⁹ Schedule 5, cl 3.6(b).

- the number of 5G 3.6GHz sites in the 17% Regional Coverage Zone (this is currently more than 400 of such sites, however this is expected to increase over time as Telstra's 5G roll out progresses); and
- the number of premises covered by the 3.6GHz band provided by those sites;
- the product construct which each of Telstra and TPG adopt for their FWA services, including minimum downlink or uplink throughput, data allowance and resiliency and how much 'headroom' is maintained for organic growth in capacity demands of existing non-FWA users (which impacts service quality over time); and
- non-FWA traffic on the sites because the capacity is pooled between mobile and FWA services. While the available sites for use for FWA will grow with the extension of 5G 3.6GHz in the 17% Regional Coverage Zone, the capacity for FWA services could shrink with the expected ongoing growth of usage per fixed user.

The FWA SIO limit for TPG and Telstra combined will be in the range of [Confidential to Telstra] [REDACTED], if assuming a [Confidential to Telstra] [REDACTED] data inclusion respectively. The Telstra FWA SIOs may be less than the Telstra estimate of the potential TPG SIOs. [Confidential to Telstra] [REDACTED]
[REDACTED]

3 FWA will only be supplied to TPG over the 3.6GHz spectrum on a 5G standalone basis, and therefore not support 5G non-standalone pursuant to Schedule 2, clause 1(a)(xv) and Annexure A to Schedule 2 of the MOCN Agreement.

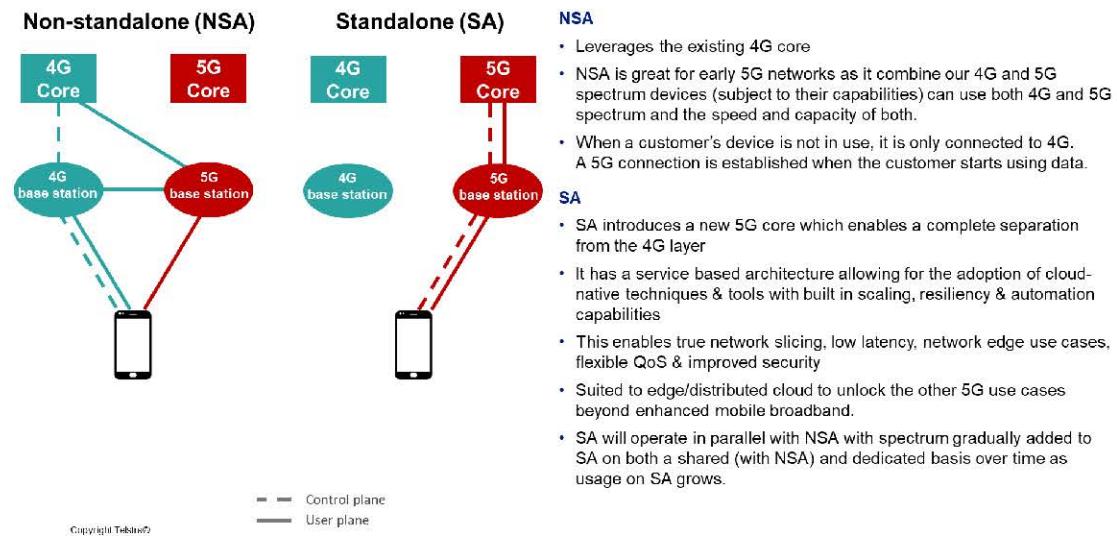
Provide an explanation as to why FWA will only be supplied to TPG on a 5G standalone basis and why 4G FWA services are excluded from the MOCN Agreement.

As noted in Question 2 above, the commercial construct for the supply of FWA services using the MOCN is directed to ensuring that the provision of FWA services does not degrade the services received by mobile customers (having regard, as noted above, to the significant increased consumption of spectrum by FWA services – around 20 times more).

The provision of services on 5G standalone assists to practically quarantine the effects that FWA services on mobile services. Non-standalone 5G is essentially a spectrum 'add-on' to the existing 4G network. If 5G non-standalone FWA services were used in the MOCN area combined with increased sales of FWA expected from TPG, this would potentially exacerbate congestion for 4G mobile users. [Confidential to Telstra] [REDACTED]
[REDACTED]

Figure 1 below depicts the differences between non-standalone 5G and standalone 5G.

Figure 1. 5G non-standalone vs standalone



FUTURE TECHNOLOGICAL DEVELOPMENTS

- 4 We refer to the Application at [194] and the Telstra Response to the Regional Communications Review 2021 Issues paper (AP-03 to the Penn Statement) at page 6. In respect of future technological developments in mobile services and telecommunications infrastructure, please identify:
- (a) for both metropolitan areas and the 80%+ coverage area:
 - (i) the approximate year you expect each MNO to launch 6G in both a future with the Proposed Transaction and a future without the Proposed Transaction, and the basis for that view
 - (ii) the growth in data demand and anticipated technological responses in the telecommunications sector you expect to occur over the next 5 to 12 years, and the basis for that view
 - (iii) to the extent not identified in your response to (ii), the developments you expect to occur in respect of neutral host services and low earth orbit satellite services over the next 5 to 12 years, and the basis for that view
 - (b) in a future with the Proposed Transaction, the likely impact you consider any developments identified in your response to (a) will have on TPG's options for transition-out from the MOCN, and the basis for that view
 - (c) in both a future with the Proposed Transaction and a future without the Proposed Transaction, the likely impact you consider any developments identified in your response to (a) will have on competition over the next 5 to 12 years and the basis for that view, including:
 - (i) impact on scale and cost of infrastructure investment by MNOs
 - (ii) impact on competition for network quality (including speed)
 - (iii) impact on competition for coverage.

Question 4(a)

The expected launch of 6G

There are no firm or concrete indications as to when 6G would be launched in the future. The Proposed Transaction is not expected to materially impact the launch of 6G.

Historically, Telstra's experience is that a new generation of mobile network is rolled out every 7-10 years (and more recent generations typically in shorter timeframes). This experience would tend to suggest that 6G technology would be available in the late 2020s or around 2030. Vendors of telecommunications equipment such as Ericsson and Nokia also predict 6G rollout around 2030.¹⁰

The first major step in the process of introducing 6G, which will ultimately determine the timing of MNO deployment, is the global finalisation of the technical standards for 6G. This work is managed by the

¹⁰ <https://www.ericsson.com/en/blog/2022/6/6g-spectrum-why-its-fundamental>; <https://www.nokia.com/about-us/newsroom/articles/nokias-vision-for-the-6g-era/>

International Telecommunications Union-Radiocommunications (ITU-R).¹¹ While that work has commenced, it is still in the early stages of conceptualisation in the 3GPP forum, which will feed into the ITU-R process.

The growth in data demand and anticipated technological responses over the next 5-12 years

Telecommunications technology and markets are highly dynamic, and increasingly intense in terms of technological innovation. Telstra has no reason to believe this would not be the case in the next 5-12 years.

In the next few years, Telstra predicts that demand for data will grow 29% per annum (as measured by busy-hour traffic). Telstra has not quantified its expectations of demand for data further out into the next 5-12 years identified by the ACCC. It is challenging to project demand out over such a long period as the next 5-12 years with any meaningful accuracy.

However, Telstra has observed accelerating demand for data and expects this trend to continue into the future. The graphs below are extracted from the RTIRC Report (and are based on Telstra data).¹²

Graph 1 – Data growth trends for download traffic volumes since 2018

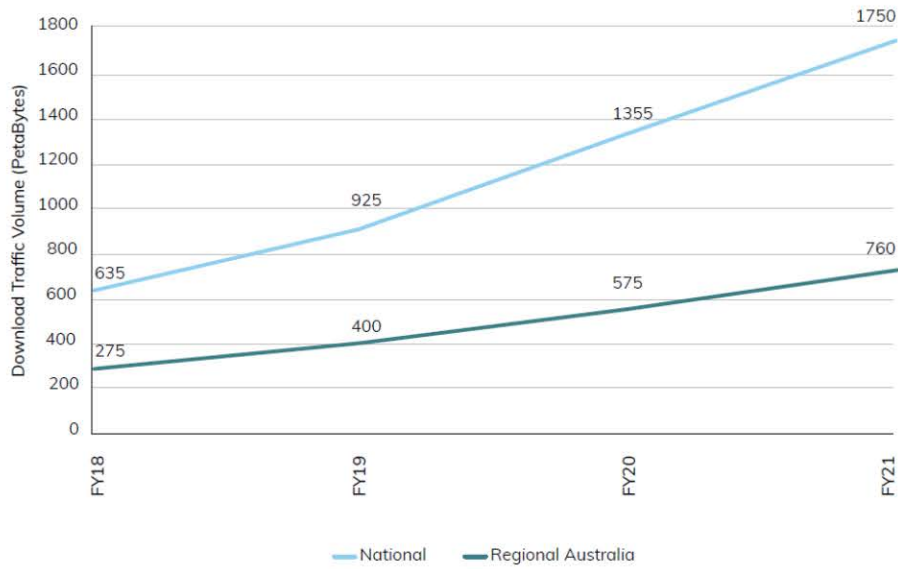


Source Telstra submission, p19

¹¹ In June 2022, the ITU-R held a workshop for experts and associations to discuss 6G, see <https://www.itu.int/en/ITU-R/study-groups/rsg5/rwp5d/Pages/wsp-imt-vision-2030-and-beyond.aspx>

¹² RTIRC Report, at p 51.

Graph 2 – Data growth in petabytes for download traffic since 2018



Source Telstra submission, p20

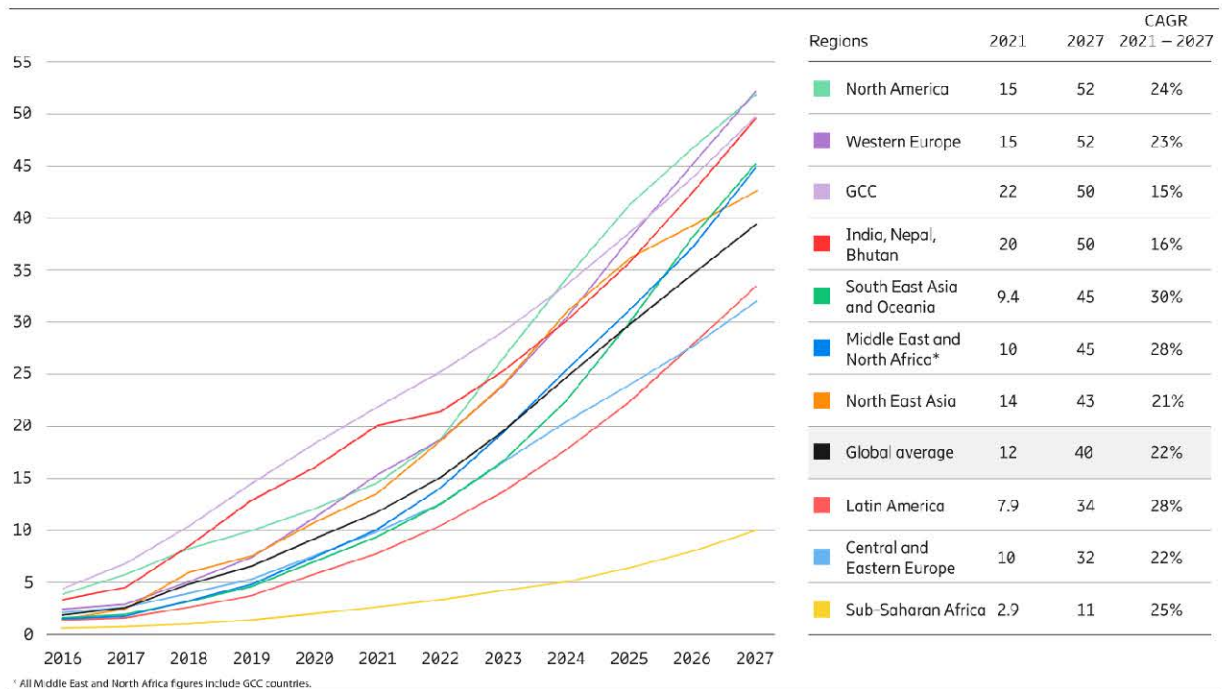
This trend will be fuelled by the ongoing growth in mobile data volume, ongoing expansion of 5G services and the emergence of new mobile and wireless based applications. Telstra considers that 5G, 6G, satellite, cloud and edge computing will be some of the technological developments in response, and also fuelling, the demand for data.¹³ These technologies are described further below.

This accelerating trend appears consistent with Ericsson's predicted growth in data demand (see **Figure 2** below),¹⁴ In South East Asia and Oceania, Ericsson predicts that total mobile traffic is expected to grow by a factor of around 6 between 2021 and 2027:

¹³ <https://exchange.telstra.com.au/introducing-t25-our-plan-for-growth-and-enhanced-customer-experiences/>

¹⁴ Figure 17: <https://www.ericsson.com/en/reports-and-papers/mobility-report/dataforecasts/mobile-traffic-forecast>

Figure 2. Ericsson - predicted mobile traffic growth

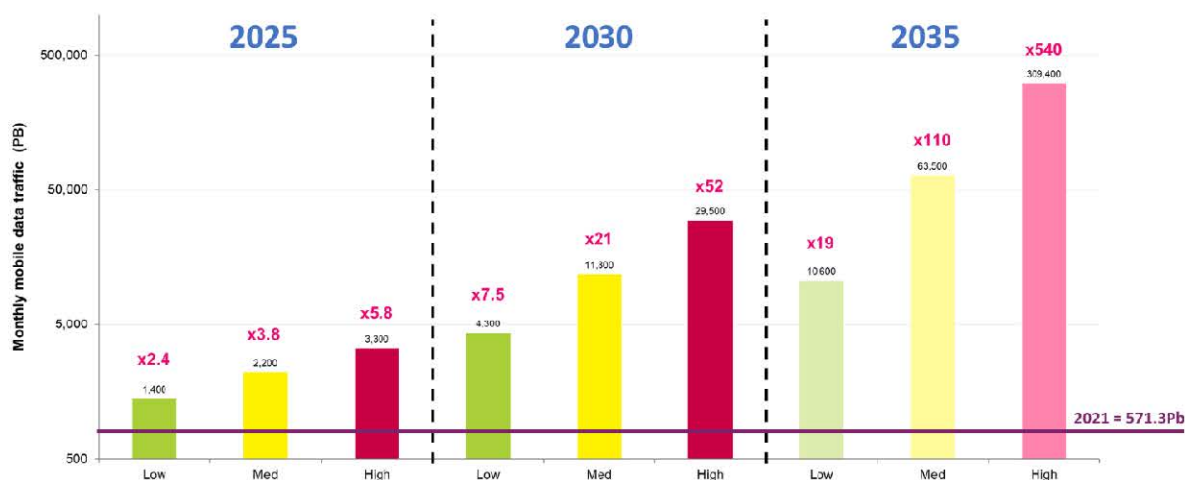


In a recent paper, the UK communications regulator, Ofcom considered three scenarios for growth in mobile data in the UK¹⁵:

- Low growth: 25% increase per year to 2030, 20% increase per year from 2030 – 2035;
- Medium growth: 40% sustained increase per year to 2035; and
- High growth: 55% increase per year to 2030, 60% increase per year from 2030 – 2035. See Figure 14, extracted below.

¹⁵ https://www.ofcom.org.uk/data/assets/pdf_file/0017/232082/mobile-spectrum-demand-discussion-paper.pdf

Figure 14: Illustration of data traffic growth over time in our low, medium and high scenarios



Note: multiples are relative to 2021 monthly mobile data traffic (571 PB); Y-axis is logarithmic, starting at 500 PB, some figures rounded. 2035 bars shaded to indicate significant uncertainty.

While Telstra has not verified or adopted these forecasts, they illustrate that the significant challenge MNOs face in managing data growth while maintaining service quality on their networks. As Telstra has submitted, the Proposed Transaction represents part of Telstra’s solution to addressing that challenge through the pooled spectrum. While this is a challenge faced by both Telstra and Optus in the 17% Regional Coverage Zone, and will require continuing investment by both MNOs, Telstra points the ACCC to the Aetha modelling which shows that, even with the Proposed Transaction, Telstra will have to build at approximately twice the rate of Optus to maintain services levels as data consumption grows.

Other technological developments in the next 5 to 12 years

Low Earth Orbit (LEO) Satellites (or LEO sats)

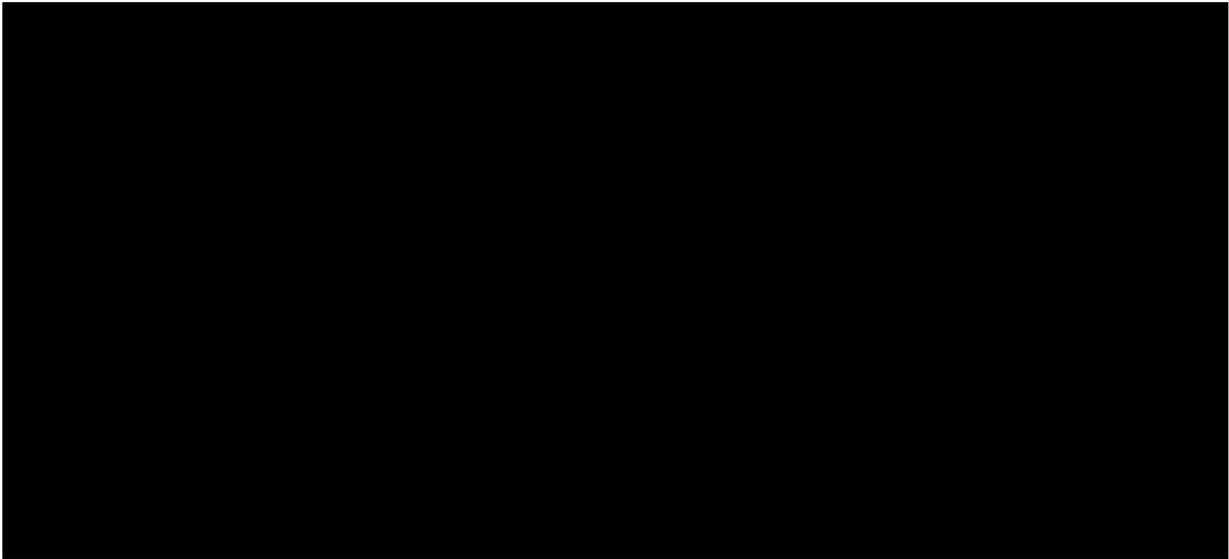
[Confidential to Telstra] [Redacted]

Telstra considers that the next generation satellite providers could [Confidential to Telstra] [Redacted] impact the way it does business, and the same is likely to apply to other MNOs (although their commercial and strategic decisions about how to use satellite technology in combination with their own mobile networks are likely to differ).

LEO sat providers were considered a risky proposition several years ago, however industry leaders such as Starlink (SpaceX) and OneWeb are rapidly progressing their deployment and commercial capabilities. Starlink already has around 69,000 active customers in the trial service. Furthermore, barriers to entry for satellite operators have reduced, with launch costs reducing from US\$18,000 per kg in the year 2000 to US\$2,700 per kg for SpaceX Falcon 9 launch in 2021.

LEO sats orbit the earth at around 500-10,000km. They have a higher capacity and lower latency (due to the lower orbit) which places them in a position to potentially play a role in terrestrial fixed and mobile networks across various use cases (see **Figure 1** below).

[Confidential to Telstra] Figure 3. Satellite may disrupt terrestrial networks across various use cases



Current use cases for Telstra (and other MNOs):

- **[Confidential to Telstra]** [Redacted]
- [Redacted]

Future use cases include:

- Consumer broadband and voice – LEO sats are considered to be able to enable an ADSL exit and a potential copper exit. **[Confidential to Telstra]** [Redacted]
- Direct to mobile handset services – LEO sats could enable near 100% outdoor mobile coverage across Australian territories. **[Confidential to Telstra]** [Redacted]
- Satellite Internet of Things – LEO sats have a niche use case with new specialist satellite IoT operators.

Telstra and TPG could adopt satellite in one of the current and future use cases as a standalone or to complement other parts of its network.

There are early developments in direct satellite to mobile handset services (which while limited at this point in time, are expected to develop and scale over time):

- Apple's recently launched iPhone 14 has satellite connectivity for texting to emergency services.¹⁶ Starlink is reported to be in talks with Apple to build in LEO sat connectivity for voice calls in iPhone 15;¹⁷
- Google reportedly will introduce satellite connectivity for Android phones in 2023, although initially probably limited to data;¹⁸
- The major handset manufacturers and satellite service providers are being challenged by challengers in the race to offer direct satellite services.¹⁹ Lynk, a US start-up, started offering direct satellite to mobile data services in 2021.²⁰ AST Space Mobile says that it is "*building the first and only space-based cellular broadband network accessible directly by standard mobile phones*"; recently confirmed the successful placement of its test satellite in space.²¹
- The mainstream mobile network vendors are also testing satellite to mobile technologies are also conducting 'live' tests of 5G non-terrestrial networks;²²
- Some major overseas MNOs are also using direct satellite to mobile technology as an option to address blackspots, such as T-Mobile in the US;²³ and
- The Commonwealth funded space research centre, SmartSat, is researching the integration of satellite and terrestrial communications networks as one of its projects to establish Australia as a global leader in pace technology.²⁴

Telstra anticipates that direct satellite to mobile technologies will become much more significant alongside terrestrial mobile, FWA and IoT networks in rural and remoter areas of the country over the next 5 to 12 years. [Confidential to Telstra] [REDACTED]

[Confidential to Telstra] [REDACTED]

Telstra notes that Optus (which owns a fleet of geostationary satellites) expressed caution about the role of LEO sats in its RTIRC submission.²⁵ However, Optus announced on 15 September 2022 that it had signed a Memorandum of Understanding (**MoU**) with AST Space Mobile²⁶ (see above) to collaborate and test direct satellite to mobile technologies. [Confidential to Telstra] [REDACTED]

Neutral hosting

Neutral host services have emerged as an option in Federal and State Governments co-funding programs in areas where there is no existing mobile infrastructure and where co-funding is available.

¹⁶ <https://support.apple.com/en-us/HT213426>

¹⁷ <https://www.zdnet.com/article/elon-musk-says-spacex-had-promising-talks-with-apple-over-iphone-14-satellite-feature/>.

¹⁸ <https://www.nextpit.com/google-direct-satellite-connectivity-feature-android-14>.

¹⁹ <https://www.bbc.com/news/technology-62796363>.

²⁰ <https://arstechnica.com/science/2021/09/a-virginia-company-has-connected-mobile-phones-directly-to-satellites/>.

²¹ <https://ast-science.com/2022/09/13/ast-spacemobile-confirms-successful-launch-of-bluewalker-3-into-orbit/>.

²² <https://www.qualcomm.com/news/releases/2022/07/ericsson--qualcomm-and-thales-to-take-5g-into-space>.

²³ <https://www.zdnet.com/article/t-mobile-spacex-promise-new-partnership-will-mean-the-end-of-mobile-dead-zones/>.

²⁴ <https://smartsatcrc.com/research-programs/>.

²⁵ <https://www.infrastructure.gov.au/sites/default/files/documents/rtr2021-submission-no-636-optus.pdf>, [93]-[94].

²⁶ CommsDay, 15 September 2022.

For example, the Mobile Blackspot Program is trialling active neutral host RAN on seven new mobile towers along Queensland's Adventure Way between Thargomindah and Cunnamulla.²⁷

The new Federal Government's election commitments included:²⁸

"Boost mobile coverage on roads – by investing \$400 million to provide multi-carrier mobile coverage on roads with coverage black spots, and in regional communities."

It is not clear what form the 'multi-carrier model' will take, but a neutral host model seems likely to be one of the options considered.

The neutral host model is still at an early stage of development, with no neutral site yet actively commissioned. Presently, Telstra considers that neutral hosting as a method for sharing active networks is likely to have a role to play in specific use cases for mobile network coverage in Australia in the next 5-12 years. That is, it has particular utility in very specific situations where the cost benefits of a shared RAN outweigh a carrier's incentive to invest (i.e. outweigh the customer benefits and ability of the carrier to offer competitively differentiated services). This includes because:

- In the instance where a carrier is using a neutral host service, it is seeking to reduce its cost and not seeking to obtain a premium service. As a result, neutral host services will tend to be specifically limited for instances where lower service quality is sufficient to meet requirements and will inevitably tend toward the lowest common denominator performance that exists among the carriers participating.
- Neutral host coverage limits the ability of the carriers participating to offer differentiated services, and accordingly its usefulness will be limited to situations where this is not important or achievable given deployment costs.
- For a neutral host to deploy multi-carrier coverage it needs to be individually integrated with all the carriers' home networks. Site placement must occur precisely so as to ensure efficient use of site capacity and to avoid interference and performance degradation on the existing and new site coverage. As a result, the viable pool of site candidates is reduced and the decision making and site selection process is slowed.
- Neutrally hosted coverage shared by all carriers will typically result in islands of coverage disconnected from the existing home network coverage of those carriers with smaller footprints. The only alternative is to end up over-building existing coverage of one or two carriers, which is duplicative of costs with no corresponding benefit as it means that no new coverage is actually provided for the investment, and as not all carriers are participating there is less economic benefit to justify the added complexity of deploying a neutral hosting approach.

In Telstra's view, it is important to view neutral host models in the broader context of technological developments which are driving to new forms of network sharing. Neutral hosts will be just one model of sharing. There remains potential for passive infrastructure sharing to expand beyond existing tower collocation under facilities access to also include sharing shelters, lease areas, and power, which further reduces per carrier costs while allowing for continued service differentiation via separate carrier RAN equipment. Other models of active infrastructure sharing besides or in addition to neutral hosting, including carrier led MOCNs as here, have a significant and potentially broader role to play, and domestic roaming will remain an important option.

Other developments also are trending towards a more open network architecture and more diverse service model in mobile services and wireless services generally. For example, at the device level handset manufacturers and chip makers are designing devices to provide high speed, high quality

²⁷ RTIRC Report p.47 (Case Study 2).

²⁸ <https://www.alp.org.au/policies/better-connectivity-for-rural-and-regional-australia-plan>

connectivity 'just about anywhere'²⁹ by being able to seamlessly utilise any available network connectivity, including mobile, FWA, WIFI, Bluetooth and satellite.

Added to these technological developments, Telstra anticipates the deployment and availability of more fibre and backhaul capacity in regional and rural Australia, as the business case for those networks improves with growing data consumption, falling deployment costs and in some cases, co-funding from Government. For example:

- Vocus (now owned by Macquarie Bank), HyperOne and Telstra have announced significant deployments of fibre in regional areas.
- State Governments are establishing communications infrastructure businesses: for example, the Queensland Communications Network (QCNFibre) has 13,000 kms of fibre network and over 20,000 towers³⁰.
- Backhaul options from new technologies, such as LEO sats (discussed above).

Questions 4(b) – in a future with the Proposed Transaction, what is the likely impact the above developments will have on TPG’s options for transition-out from the MOCN?

While the precise impacts on TPG’s options are a matter for TPG, Telstra provides the following information to assist the ACCC. In doing so, it is relevant to focus on the precise terms of the Agreements, understanding their direct impact on TPG’s position and how the clauses are structured for a transition-out from the MOCN.

The most immediate impact of the Proposed Transaction is that TPG can offer customers 4G and 5G coverage in the 17% Regional Coverage Zone sooner, and in a much more comparable way to both Telstra and Optus, while leveraging its substantial investment in metropolitan networks. It can do so for the term of the Proposed Transaction (which creates optionality for TPG at years 10, 15 and 20 to assess its position). As set out in the Application, the Proposed Transaction provides in the 17% Regional Coverage Zone some wholesale revenue for Telstra (for sharing its RAN with TPG), Telstra and TPG access to pooled spectrum for 4G and 5G services, and TPG enhanced 4G and 5G coverage through the RAN (while maintaining its independent core) and hence its expected competitiveness. This is the scope of what the Proposed Transaction does.

When considering this impact against a 5-12 year horizon, it is generally difficult to predict precisely what would occur in the future for mobile telecommunication technology developments. The past indicates that the industry expects dynamic innovation in the next 5-12 years, and there are early indications of new technologies. The precise shape, potential, and the timing of those technology developments remain unknown.

Accordingly, the Agreements are structured to prioritise flexibility and optionality in the longer term horizon. The initial term (10 years) and optionality (of two further 5 year extensions at TPG’s election) of the Proposed Transaction, together with the generous 36-month transition out period (at TPG’s election) facilitate this. [Confidential to Telstra] [REDACTED]

In essence, the Proposed Transaction enables TPG today to remain in the ‘technology race’ by keeping up with 4G and 5G on a nationwide basis which forms a platform to place TPG in a better position to access a greater number of other commercially feasible options at the expiration of the initial term (or other subsequent terms).

²⁹ <https://www.qualcomm.com/snapdragon>

³⁰ <https://www.qcnfibre.com.au/>

³¹ [REDACTED]

Enhancing the ability of TPG to access the potential developments in the future is valuable. The potential impacts of these future developments are discussed in response to Question 4(c) below.

Question 4(c) – with and without the Proposed Transaction, what is the likely impact of the developments above on competition over the next 5 to 12 years?

The technological developments will unlikely have different impacts to competition in the next 5-12 years with and without the Proposed Transaction

Beyond what the Proposed Transaction does for Telstra and TPG as set out, it is difficult to say in an industry as dynamic as telecommunications with a high degree of certainty or confidence how technological developments and their impact on competition will play out over such a long period as the next 5 to 12 years.

That said, in Telstra's view, given the dynamic nature of the industry, the better view must be that the technological changes discussed above will not be materially different in a world with or without the Proposed Transaction for all MNOs. In part because:

- The initial term of the Proposed Transaction will expire during this time.
- The impact of the Proposed Transaction must be viewed more widely than the 17% Regional Coverage Zone. While there may be some uncertainty where the drivers of the investment case will be – however it almost certainly will not be determined by what occurs in the 17% Regional Coverage Zone (given it is a small part of the overall population). Rather it will be mainly driven by the 0-81.4% of the population coverage area.
- The developments described above are much larger than, arise independently of, and are unlikely to adversely impacted by the MOCN between Telstra and TPG in the 17% Regional Coverage Zone. Those involved in mobile telecommunications are aware that the industry is characterised by MNOs and new entrants (e.g., Big Tech) chasing new technologies to innovate their services in order to 'leapfrog' competitors (i.e., vying for supremacy using all available technology at any point in time). Telstra expects that MNOs will need to constantly innovate the design of their network to seek to outcompete other MNOs through the adoption of new technologies in new and creative ways. The Proposed Transaction will not materially change this for MNOs.
- Many of these technological developments are suitable for, and are even being specifically developed to, address the long-standing challenge of coverage in regional and remote areas. These technological developments are not linear or incremental developments in serving regional and rural areas, but could be transformative. The developments noted above can be expected to open up pathways and opportunities for new forms of network competition between all MNOs (and new entrants) by reducing costs, creating new options for meeting the coverage gap in regional and rural Australia, and reducing reliance on old forms of network technology. The current RTIRC review recognised that there has been a marked, step change in the technological and competitive options for service delivery in regional and rural areas with *"emerging technologies like Low Earth Orbit (LEO) satellites, Low Power Wide Area Networks (LP-WAN) and 5G cellular technology...likely to play a larger role in the Australian telecommunications landscape."*³²

These developments suggest that any static analysis of the incentives of each MNO should be approached with caution. Dynamic markets create dynamic incentives to continue to seek innovative ways to compete

³² RTIRC Report, at p 8.

Any assessment of the impact on competition of longer term technology developments must consider the broader context of the mobile telecommunications industry

6G provides a good example of how, in Telstra's view, MNOs will have powerful incentives to continue to invest in new technologies, and why these incentives will continue to apply to all MNOs, including in the 17% Regional Coverage Zone, if the Proposed Transaction is approved, including in relation to Optus.

As Telstra notes above, an inherent characteristic of mobile technologies is that each technology generation will be replaced by another superior technology in cycles of 7-10 years, with those cycles potentially shortening. MNOs face a set of 'pull' and 'push' incentives to upgrade their mobile technologies to the next generation:

- New generations of technology have greater spectral efficiency and are capable of handling increased congestion. Rather than expanding capacity in current technology to address growth in data consumption, it would be more efficient for an MNO to move to the next generation of technology which is likely to deliver substantially greater capacity;
- As mobile standards are globalised and driven in large part by the equipment vendors, they have incentives to shift their manufacturing and support services to the next generation of technology once it is developed. As global standards create a global market, vendors are quickly able to build critical mass in the new technologies, shifting the 'gravity' of the industry on the supply side;
- Beyond the 3G generation, third party apps and content providers have increasingly been the drivers of mobile data usage. Some of this third-party content can only be support on the newer generations of technology (e.g. 6G will have much lower latency needed to support highly interactive apps) while others can be used on a pre-existing technology but significantly add to the congestion and network management issues. If MNOs seek to maintain service levels and support these new content services, the point will be reached where continued modifications or upgrades to their existing generation of technology will not 'cut it' with customers, and the MNO will have to move to the next technology or risk losing substantial proportion of its customer base;
- The release of new sophisticated handsets by the device manufacturers also is an external force which can drive technology decisions by MNOs. The growing sophistication of these devices has a compounding effect with the proliferation of third-party services. While the backwards compatibility of handsets with older technologies is a feature of 3GPP technologies, most consumers upgrading to a new handset which is promoted by the vendor based on what it can do on a newer technology would expect to be able to use it, at least in some coverage areas, using that new technology;
- There are customer impacts associated with 'sitting on' older mobile technologies in particular areas, such as regional and rural coverage, while upgrading to newer generations of technology in metropolitan areas. The 'Vodafail' experience to which Optus points in its submission is an illustration of this risk and MNO can face by deciding not to 'keep up' with technology cycles across its whole footprint;
- There are also network and spectrum inefficiencies associated with 'sitting on' older mobile technologies. While multiple 3GPP technologies can be used simultaneously across a network, the complexity, cost and spectrum management issues escalate significantly the more technologies are supported. As the technology cycle moves on, vendor support for the older technologies diminishes and costs increase as the user base globally rapidly shrinks. As the newer technologies are more 'spectrum hungry', spectrum used to support older technologies needs to be re-farmed; and

- As a general observation, it is important to note that the transition from one generation of mobile technology to another is not sudden nor simultaneous for all MNOs in competition with each other. As past experience shows, there is a significant overlap period between successive mobile technologies. A MNO can effectively compete using the immediately preceding technology against another MNO which has upgraded to the next generation of technology. **[Confidential to External Counsel]** [REDACTED]. The MNO on the older technology may need to find other basis to compete, such as on customer service and price. Decisions about the timing and sequencing of the transition to a new generation of mobile technology will depend on a range of commercial factors for each MNO, and those decisions on timing are within the expected ambit of dynamic competition between MNOs.

The Proposed Transaction does not impact the incentives that drive MNOs to invest in and deploy the next generation of mobile technology – 5G in the next few years and 6G beyond. The reality is that all MNOs will need to continue to invest and utilise new technologies in different and varied ways to service customers and differentiate themselves to avoid a 'Vodafail' situation.

TPG's reasons for entering the MOCN with Telstra demonstrate the force of these incentives. The Proposed Transaction provides it with an opportunity to monetise its 5G network and better address the escalating consumer data demand, but it is not expected to materially change the impact these incentives to continue to invest in the long run, including to 6G.

The technological developments are expected to deliver MNOs (and other potential entrants) greater optionality in terms of managing the cost of infrastructure investment

Competition between vertically integrated MNOs has driven significant deployment of mobile network infrastructure in regional and rural Australia.

With the entry of more competition at the infrastructure, wholesale and retail level, MNOs have more alternatives to their own vertically integrated networks to defray the increasing, and recurring costs, of successive generations of technology. These developments include:

- the three MNOs have established specialist tower companies with independent shareholders, with the objective of releasing capital and those tower companies competing against each other, and other private and public passive infrastructure providers;
- MNOs will have the benefit of increased competition in wholesale inputs, including in backhaul from new fibre and LEO sat providers as discussed above;
- there will be more options for active and passive sharing of infrastructure as an open network architecture is adopted, with the potential for some cost savings in installation and operation of networks in regional and rural areas; and
- existing business models will change and new business models emerge at the retail, wholesale and infrastructure levels. Various models of network sharing are likely to be other new entrants supplying upstream network inputs (such as HyperOne and QNCFibre) and the MNO business models themselves may change with developments such as the Open RAN: e.g. Vodafone is an early deployer of Open RAN in Europe.³³

Telstra expects that in light of these developments, competition for coverage, including to upgrade existing coverage from 4G to 5G, will remain a feature of the market for some time to come

³³ <https://www.vodafone.com/about-vodafone/what-we-do/technology/open-ran>

All MNOs, including Optus, will continue to participate in the competition for coverage in regional and rural areas, because:

- as noted above, there will be more options for active and passive sharing of infrastructure from which MNOs can benefit;
- in the medium term, there will be an increasing range of wireless technologies and services which in some settings will be complimentary or additive to the MNO networks and in other cases will be substitutional. Unlike technologies which came before them, many of these technologies are specifically developed for or are suitable for deployment and use in regional and rural areas, such as LEO sats. As T-Mobile has done in the US, Optus could use LEO sats to make up or even exceed the Telstra terrestrial network coverage. As noted above, Optus is already committed to testing this technology; and
- Federal and State Governments have announced and are likely to remain committed to substantial additional investment in regional and rural infrastructure. Optus can continue to participate in competitive tendering for co-funding from Federal and State Governments, either individually, or partnering with a neutral host or potentially with TPG, as the MOCN is non-exclusive and does not cover the areas beyond the 17% Regional Coverage Zone.

Accordingly, Telstra believes that:

- [Confidential to Telstra] [REDACTED]
- [REDACTED]
- [REDACTED]

Assessing the above impacts of the technological developments against Optus' contentions

Telstra is aware of submissions made to the ACCC by Optus (that the Proposed Transaction materially adversely impact its investment incentives), and that the ACCC may be seeking assistance to understand Telstra's views on competition in the future from Optus. Telstra makes the following observations.

Where is Optus' network investment today?

To assess the question of rational commercial incentives it is important to understand where the Optus network stands today.

In Telstra's view, Optus has moved past the point of 'critical mass' coverage in regional and rural areas, including the 17% Regional Coverage Area. As the ACCC's data shows, Optus has aggressively built new sites in rural areas. Optus coverage may be less than Telstra coverage in the 17% Rural Coverage Zone, and [Confidential to Telstra] [REDACTED]

[REDACTED] This is consistent with recent observations Telstra makes (from publicly available sources) around Optus' sit upgrades and build in regional areas

appear to Telstra to be to supplement capacity in existing townships rather than expanding coverage (i.e., through MBSP sites).

Optus risks not maximising its substantial sunk investment in 5G in metropolitan areas if it is unable to seamlessly offer comparable services across its national network, including in the 17% Regional Coverage Zone.

In light of the above developments, is it rational to expect Optus' incentives to invest will be materially adversely impacted by the Proposed Transaction?

There are three ways in which Optus' contention around its investment incentives may be viewed.

First, Optus could be meaning that it would wind back existing coverage in the 17% Regional Coverage Zone. In Telstra's view, that seems highly improbable because:

- this investment is sunk – there would be significant costs in decommissioning;
- withdrawing coverage is likely to cause considerable confusion amongst Optus customers (including in metropolitan areas), which could translate into significant churn away from Optus, and cause brand damage; and
- Optus' commercial agreement with its towerco, ATN, may impose commitments on Optus to retain current sites (the agreement might even include a commitment by Optus to continue commissioning new sites).

Second, Optus could be meaning that it will draw a line at current investment and make no new investment in the 17% Regional Coverage Zone. In Telstra's view, it is highly improbable Optus will not continue to invest in capacity in existing sites because that would mean, given the rapid growth in data consumption, that service levels would quickly decline, which could translate into significant churn away from Optus, and cause brand damage. It is also highly improbable that Optus would not invest in upgrading its 4G network to 5G given:

- The types of incentives outlined above which drive MNOs to adopt the next technology generation;
- LEO sat operators are likely to vertically integrate down to compete with MNOs in terms of non-terrestrial coverage in regional areas. At least initially, use of LEO sat services may involve some trade-off between coverage and service quality. In order to compete and retain customers, Optus would face competitive pressure to invest to improve the quality in its terrestrial mobile network in the 17% Regional Coverage Zone;
- That Optus has already deployed a highly competitive 5G network in metropolitan areas;
- That Optus has already pre-invested heavily in the elements of a 5G network in the 17% Regional Coverage Zone: Optus has extensive existing passive network infrastructure and backhaul which can accommodate 5G kit, it has invested over \$1.476 billion in 900 MHz spectrum³⁴ and Optus has been utilising leading edge technical solutions which substantially reduce the costs of upgrading from 4G to 5G.³⁵

Lastly, Optus could mean that its investment in the 17% Regional Coverage Zone will be targeted if the Proposed Transaction is approved. Telstra notes that:

- Optus is already pursuing a targeted network rollout in regional and rural Australia.
[Confidential to Telstra] [REDACTED]

³⁴ <https://www.optus.com.au/about/media-centre/media-releases/2021/12/optus-acquisition-of-new-900-spectrum>.

³⁵ See Telstra's Tranche 2 response to Optus' interested party submission, [99(d)].

- [REDACTED]
- Optus would continue to have incentives to adopt its targeted network rollout strategy as against TPG, [Confidential to Telstra] [REDACTED]
 - The existing coverage which Optus has achieved across the 17% Regional Coverage Zone, including by using this targeted strategy, has gone beyond a 'tipping point' where Optus is providing a strong competitive challenge to Telstra across the 17% Regional Coverage Zone; and
 - Even if it is accepted that the Optus investment in its own terrestrial mobile network could be more targeted if the Proposed Transaction is approved than currently, Optus has failed to show that this rises to the level of a substantial lessening of competition:
 - as noted above, Telstra believes that Optus has already reached a 'critical mass' of coverage in the 17% Regional Coverage Zone, and as also discussed above, it is improbable that Optus will roll back that coverage or not continue to invest in capacity to maintain service quality
 - the larger technology developments described above will provide Optus with other options to extend and improve coverage. As noted, Optus has signed a MoU with a direct satellite to handset service provider; and
 - given the 'response-counter-response' dynamic between competitors which characterises the telecommunications industry, some rethinking of Optus of its strategy would be expected as it seeks to counter any competitive advantage that Telstra and TPG gain from the MOCN, and therefore any narrowing of Optus' targeted investment in its own terrestrial network should be regarded within the ambit of the backwards and forwards between MNOs that plays out over time.

Conclusion

When the Telstra-TPG MOCN is viewed in the context of these rapidly emerging changes relevant to serving the communications needs of regional and rural Australia, Telstra believes that the Telstra-TPG MOCN is consistent with the growing global trend for MNOs to find more innovative ways to share infrastructure in the regional and rural areas. The three MNOs continue to compete on their own 5G networks for most consumers.

While Telstra does not agree with Optus' view that it will scale back its terrestrial network deployment as a result of the Proposed Transaction, Optus views the options available to it through the narrow prism of the historical model of vertically integrated MNO services and infrastructure. It is clear from the answers above that there will be more optionality availability to Optus and that those trends are already emerging, as Optus' recent MoU covering testing of LEO sat to mobile services illustrates that Optus recognises.

Accordingly, as RTIRC recognised, Telstra submits that Australia has reached a turning point where technological developments and new commercial approaches which those developments support, can address long standing concerns about coverage in regional and rural Australia. Optus seeks to bind developments in regional and rural Australia to the vertically integrated model of the past to protect its own competitive position, whereas the Telstra-TPG MOCN is an example of the innovative models to bring more choice and innovation for people living and working in regional and rural Australia. The Telstra-TPG MOCN will not be the end of these developments, but the beginning. If Optus has been

taken 'by surprise' by this commercial development, its competitive challenge is to find its own solution from the expanding options at the infrastructure, wholesale and retail level in regional and rural Australia.