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Regional Mobile Infrastructure Inquiry

Report on preliminary findings

Response by Pivotel

16 May 2023

As a licenced Mobile Network Operator with a dedicated focus on the digital connectivity needs of regional, rural and remote Australians, Pivotel welcomes the opportunity to comment on the ACCC's Regional Mobile Infrastructure Inquiry - Report on preliminary findings.

CONTEXTUAL STATEMENT

- Pivotel operates a mobile and satellite telecommunications network pursuant to a carrier licence issued by the Australian Communications and Media Authority in accordance with the Telecommunications Act 1997 (Cth) (Telco Act) and operates ground infrastructure in Australia, making it the fourth public mobile carrier in the country.

- As Australia's 4th mobile network operator with a pure focus on regional, rural and remote Australia Pivotel is well placed to play a unique and relevant role in improving coverage and bringing innovation to regional and remote parts of Australia. Our 4G / 5G mobile network, marketed as ecoSphere®, can cost effectively deliver wide area mobile coverage to remote communities, mining, agriculture and pastoral properties using satellite or terrestrial backhaul, using innovative technology and a unique network architecture.

- Pivotel's experience demonstrates that a dynamic and flexible approach is required to deliver digital connectivity to Australia's unique and geographically dispersed population providing more targeted and innovative approaches, which are required to service these low population density areas and more challenging locations.

- Regional network builds face a unique set of challenges which typically result in higher costs due to more challenging terrains and remote locations in less densely populated areas. This effectively makes the business case for regional and remote far more challenging.

- As a mobile operator focussed purely on regional and remote Australia, we observe that rural community communication needs are constantly evolving and expanding, and despite years of federal and state government subsidies and funding, a substantial proportion of users remain underserved by incumbent operators.

- ecoSphere ® is a cost effective and innovative approach to building networks in regional and remote areas, however site access, backhaul and access to suitable spectrum remain uniquely challenging.

- Pivotel, and other smaller providers, are effectively locked out from accessing the most suitable spectrum (< 1 GHz) for covering large regional and remote areas, resulting in higher costs and a lower level of service for end users in these areas.

- In this response Pivotel has not addressed all items in the preliminary findings and has focussed on the provision of some comments regarding specific findings and broader issues in relation to Regional Mobile Infrastructure.

Pivotel's comments and feedback

TowerCo's business model

Despite substantial Commonwealth and State funding having been used to fund Mobile Network tower builds in regional, rural and remote Australia, full ownership of these towers has vested with the Mobile Network Operator (MNO). All 3 operators, to a greater or lesser extent, have in recent times been able to sell these towers to a 3rd parties at attractive rates, irrespective of the level of funding contributed by the MNOs and the book value of the assets.

These 3rd parties are typically JVs with their own mandate for optimising commercial return on these tower assets through the application of commercial rents linked to the reset cost base arising from the acquisition. While the idea that any incremental revenue that can be derived on a tower is better than none, we do not expect to see this thinking emerge in the short to medium term while the TowerCos explore all opportunities to maximise rental returns.

We believe it is likely that we will see higher rents in the short term, including in regional areas where the economics are far more challenging thus creating further disincentive to access seekers seeking to extend their regional network coverage and enhance competition.

Government funding programs supporting passive sharing

It is a well-known fact that two thirds of Australia's land mass does not have the privilege of having access to fast and reliable terrestrial broadband connectivity (mobile or fixed), resulting in a lack of digital access enabling the adoption of new technologies that improve not only our quality of life, but has the ability to improve productivity and workforce capability driving higher yields at lower costs, deliver e-education, e-health, improved health and safety outcomes and connectivity during natural disasters.

The historical approach to Commonwealth and State government funding programs has been to fund tower infrastructure to support expanded regional coverage. Whilst these programs have increasingly sought to enable passive tower sharing, 80% of sites funded under the MBSP have been granted to Telstra (see Table 4.3 below), which has had the ultimate effect of further extending its network well beyond its competitors, thus creating an effective 'moat' between its outer coverage areas and competitor networks.

Despite the funding of the towers and associated obligations around access, particularly in regional and remote Australia, the level of passive sharing to date has been limited, "As at 31 January 2022, Telstra had the lowest percentage of co-location with 35% of its total sites co-located with another MNO. Rates of co-location vary across ABS Remoteness Areas and decreases across all MNOs as you move to less populous regional and remote areas. Co-location by all 3 MNOs was the most common co-location combination and TPG & Telstra was the least common."[1]

It is clear from these statistics that previous programs supporting passive site sharing have been somewhat effective at providing enhanced coverage for Telstra's network, benefiting users on that network only, whereas Optus and TPG have not been as successful with far less sites being funded.

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[1] 2022 ACCC Mobile Infrastructure Report, page 4

The ultimate effect of this historical approach is further co-funded investment in Telstra's network coverage, allowing it to grow more rapidly than its competitors' networks, which has the adverse effect of making it far more challenging for Optus and TPG to successfully win grant funding in future funding rounds as those programs are designed to strongly favour new coverage.

Table 4.3: Total number of Federal Government Mobile Black Spot Program sites by MNO & ABS Remoteness Area – 2020 to 2022

	2020	2021	2022
Major Cities of Australia			
Telstra	8	11	14
Inner Regional Australia			
Optus	22	26	41
Telstra	187	222	234
TPG	8	8	8
Outer Regional Australia			
Optus	21	22	30
Telstra	276	320	340
TPG	44	44	43
Remote Australia			
Optus	16	17	21
Telstra	87	96	102
TPG	8	8	8
Very Remote Australia			
Optus	34	37	44
Telstra	72	87	98
Total			
Optus	93	102	136
Telstra	630	736	788
TPG	60	60	59

F gure 1: Tab e 4.3 from ACCC Mob e Infrastructure Report 2022[2]

The historical favouring of funds towards passive (tower) infrastructure sharing and coverage over competition, has resulted in regional areas having access to one dominant network and two relatively weak competitor networks.. Telstra claims to have around 2.5million km^2 of high speed data and voice coverage, resulting in 1million km^2 of additional coverage over that of its nearest competitor. This is also reflected in the number of Amplitel towers which are part of the Amplitel / Telstra JV.

This Telstra coverage advantage has been used as a competitive advantage and enabled it to attract a higher number of mobile customers while also charging a relative premium for service. Despite technological advancements and developments in other markets in active RAN sharing, the mobile industry in Australia has been slow to adapt, favouring passive tower sharing over active RAN sharing.

Active RAN Sharing / Neutral Host

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[2] 2022 ACCC Mob e Infrastructure Report, page 14

Pivotel is an active proponent and supporter of Shared RAN and Neutral Host networks. We have consistently advocated for the sharing and co-use of regional and remote networks to provide access to all mobile network users irrespective of the network they are subscribed to.

As regional networks extend into more marginal areas with low population densities and limited revenue potential it becomes imperative to improve network economics through suitable network sharing arrangements, whereby the host operator receives appropriate financial consideration from other network operators for the provision of that coverage. The ability to maximise the revenue opportunity by providing access to all comers on a single set of infrastructure while also enabling competition is essential if mobile coverage is to expand further even with high levels of government co-contribution.

The host operator need not be one of the incumbent operators. As has been demonstrated in New Zealand, government backed structures involving the MNO's as JV partners is also a viable option. Radio Access Network (RAN) sharing results in greater cost savings than simple co-location and tower sharing. Network operators have used the concepts of MORAN (Multi-Operator Radio Access Network) and MOCN (Multi-Operator Core Network) to reduce the total amount of infrastructure required to support their services.

The recently published Agri-tech Expert Working Group (AEWG) report, commissioned by the DTIRDC and prepared on behalf of the Australian Broadband Advisory Council (ABAC)[3], provided some useful insights into the issue of inadequate digital connectivity for regional and remote users. "The main finding of our discussions is that across the country, beneath the broad brush strokes of mobile coverage and National Broadband Network (NBN) fixed and wireless networks, there are localised connectivity gaps on, across and between farms. We have called this patchiness 'salt and pepper connectivity'".

It goes on to say "National carriers may continue to be the primary providers of connectivity in rural Australia, but their focus – in terms of both technology and business outcomes – is on serving premises and 'people on the move' along transport corridors. It is not reasonable to expect that the national carrier business models, even with stepped up 'push-pull' approaches from government, will solve what is essentially a local scale problem. As a result, what we have seen is the emergence of alternative approaches in the market, including farmers installing bespoke solutions, as well as a cohort of second tier retail service providers (RSPs) who are filling in the salt and pepper.

A range of Small and Medium Enterprises across the country are deploying connectivity solutions at a fraction of the cost of the main carriers. Some of these small networks operate as substitutes for the carrier network, others extend the range of the carrier networks. A cohort of Australian and international companies offering Low Earth Orbit (LEO) satellite communication solutions is also emerging. These solutions range from low cost narrowband Internet of Things (IoT) technology, to 'always on' broadband coverage."

Pivotel falls into this camp of second tier RSPs, with the proven ability to build mobile networks, connected via fibre backhaul, and / or existing and emerging LEO / MEO satellites, delivering broadband connectivity exclusively focussed on regional and remote communities. Commonwealth funding programs like the RCP with the "objective of Round 2 of the Program is to use a place-based approach to target telecommunications infrastructure investment that will respond to local priorities and maximise economic opportunities and social benefits for regional communities and businesses"

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[3] https://www.infrastructure.gov.au/department/media/publications/agri-tech-expert-working-group-june-2021

are well placed to help close the digital divide between metropolitan and regional / remote areas, as highlighted in the AEWG report.

It has been a feature of past Commonwealth government programs that the majority of grant funding has been issued to incumbent operators (three quarters of MBSP funding to Telstra, two thirds of RCP Round 1 funding issued to Telstra and NBN projects), effectively extending their footprint and technology in more populated places and reducing the level of competition, despite the emergence of new and innovative providers who are ideally placed to deliver more targeted solutions, better able to reach areas of little interest to incumbents more cost effectively and through a more focussed strategy and association with local stakeholders.

As highlighted in the AEWG report, incumbent mobile network operators are focussed on the provision of connectivity to townships and major roads, providing limited or no coverage at the homestead and across the broader rural property. Their business models do not support broad area coverage of remote communities and rural properties.

Additionally, through its discussions with regional stakeholders, Pivotel is aware of many areas that may show demonstrable 4G coverage in a particular area per a provider's coverage maps, only to be told by local users, the network claims and speeds are unstable and/or inferior to what is being claimed. These areas should therefore be included as eligible areas delivering improved connectivity and economic and social benefits to these underserved areas as envisaged under the program.

Spectrum

Pivotel notes the ACCC comment "All mobile network operators (MNO's) have sufficient access to low-band spectrum suitable for various mobile technology generations (e.g. 4G and 5G) which enable them to provide a wide geographic coverage".

Pivotel fundamentally disagrees with this point on the basis that it only covers existing incumbent MNO's and specifically excludes new and emerging MNO's such as Pivotel with a focus on providing mobile and broadband in regional, rural and remote areas and is unable to access low band spectrum due to this spectrum being tied up by the incumbent MNO's.

Despite substantial Federal and State Government programs, the current practice of issuing mobile specific sub 1GHz spectrum (i.e. 700MHz, 850MHz and 900MHz) on a national basis has resulted in scarce and valuable spectrum being underutilised, and unused over approximately two thirds of Australia's landmass, with little means of access for providers other than the large incumbents. For Australians living, working and moving around in the two thirds of the country that is outside of the national MNOs coverage, this would not be considered the "highest value use" of the spectrum in those areas.

The lack of access to suitable spectrum is deterring investment and innovation in the development of suitable alternatives to the existing large incumbent(s) to the detriment of public users.

Middle band spectrum (e.g. 1,800MHz and 2,100MHz) results in an increased number of sites, additional equipment and civil build costs, to obtain similar coverage outcomes. Pivotel, and others, could deliver the same outcomes more cost effectively if they were able to access spectrum in the sub 1GHz range.

The current national licencing approach effectively 'locks out' non-incumbent providers from building new and innovative solutions and does not deliver on the ACMA's requirement to maximise the overall public benefit derived from efficient spectrum allocation.

The lack of competition and innovation in addressing regional and remote coverage is demonstrated by the fact that the incumbents have chosen not to build networks beyond chosen profitable areas unless they attract a government subsidy. These are predominately metropolitan, key regional, tourist, and other high traffic areas. This has left us with a sub-optimal outcome whereby the incumbent operators have exclusive access to spectrum that is not being used, and whereby governments are forced to contribute substantial sums of money to encourage further build out of networks, most often to further enhance the coverage of the largest incumbent and effectively reducing, or removing all together, choice for users in regional and remote areas.

This historical approach has had the effect of stifling competition and investment from smaller more innovative companies with leaner, newer technologies and approaches, that have emerged in recent years. This further cements the digital divide for regional and remote communities due to the lack of suitable broadband access and impacting the ability to deliver first-world health, safety, education, productivity, and efficiency benefits that most Australians, who live in 'economically viable areas' take for granted.

Temporary Mobile Roaming

Pivotel notes the comments in the ACCC's preliminary report regarding temporary mobile roaming technical feasibility and questions of complexity risk and cost. The solution canvassed only covers roaming on existing networks and doesn't take into account other more innovative approaches that can also be considered as a supplement or replacement to roaming on existing incumbent networks.

Pivotel sees the potential for a 'neutral party' to provide an open access, network agnostic service, whereby all MNO's can actively access shared temporary telecommunications facilities i.e. Cell On Wheels (COWs). This approach would see one carrier effectively providing a one-way roaming / MOCN shared RAN solution to Telstra, Optus and TPG Telecom, allowing access to all mobile users irrespective of their existing provider, and is similar to the technical approach adopted in New Zealand through the Rural Connectivity Group.

It is not uncommon for disasters or emergency events to occur in areas of little or no mobile coverage and this approach would allow emergency responders to request (and/or provide) temporary mobile coverage whenever and wherever required, whether or not the existing mobile infrastructure of one or more MNOs has been damaged or rendered inoperable due to disaster.

This service could be provided on a managed service basis by a third party such as Pivotel, who has experience in building and deploying COW's and whereby a pre-determined number of COWs could be deployed to nationally distributed locations, where they would be provided as a managed service. Deployment could be managed by appropriately trained emergency services departments and centrally coordinated.

Under this model only one COW would need to be deployed to an impacted area, servicing all emergency response and public users of the three incumbent MNO's.

In real terms, this approach, utilising a shared RAN / roaming, and without sacrificing quality or reliability, is potentially a more cost effective and efficient solution than alternatives and could provide an enhanced ability to cover more areas affected by natural disasters through economies of scale and reduced duplication of costs and resources.

For any questions in relation to this submission please contact:

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Pivotel Mobile Pty Limited

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Appendix

Pivotel has developed 'ecoSphere®', a 4G/5G mobile network capability, now complemented by FWA, that has been purpose-designed for regional and remote deployments, which has already been deployed in a variety of environments including remote communities, agriculture, mining, and temporary coverage needs. The networks vary in size from those designed to provide coverage and connectivity to entire regions to single base station deployments. The addition of FWA capability to our service delivery is in recognition of the rapid adoption of streaming and video conferencing technologies over the past 12 to 24 months.

The ecoSphere® radio base stations (ecoCells) are typically lower powered versions of macro size mobile base station producing up to 5W of output power. These can be deployed as a wide area solution uses a distributed network of compact, autonomous, LTE base stations, connected via microwave links back to a dedicated switching hub, that in turn is connected to a high-capacity internet connection or as a single site servicing a particular location. Depending on geography single sites can cover a radius of 10-15 kms. Pivotel's satellite services in some cases support and/or complement the ground-based LTE network.

Our ecoSphere® networks typically include a local 'core', with a connection to a data link for all external internet traffic. A Local Core means the network can keep operating in a local context even if connectivity to the outside world and facilitates edge processing of data potentially relieving some pressure to carry all data over expensive transmission links.
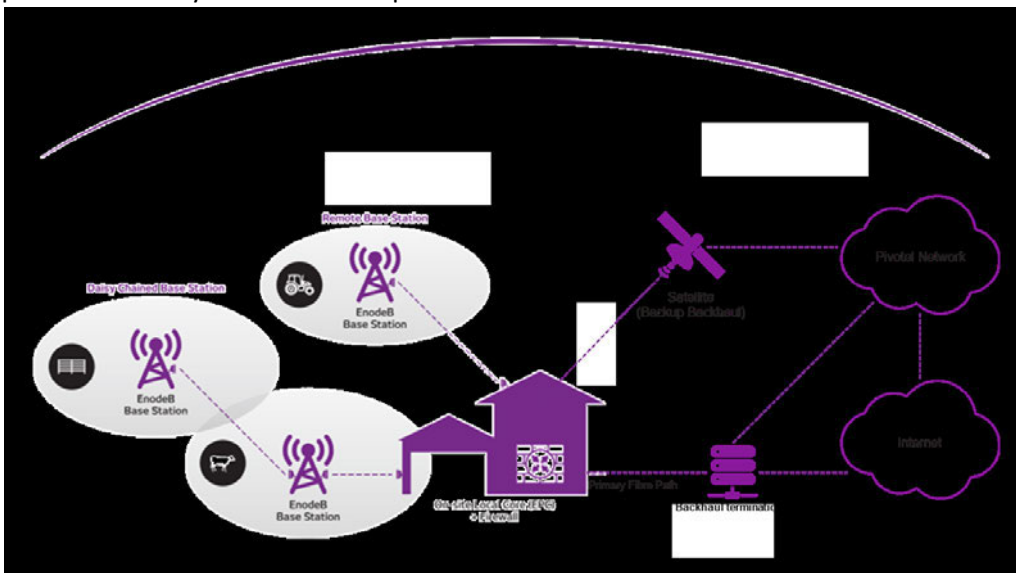

Fig. 1 – ecoSphere® network with a Local Core

Taking an agricultural deployment example, the use of 4G LTE technology allows ecoSphere® to provide a single communications solution capable of covering large distances, and supporting a wide range of applications, from high bandwidth use such as home broadband connectivity, camera and security systems, and personal communications, to low bandwidth devices such as soil and water monitoring, and irrigation systems.
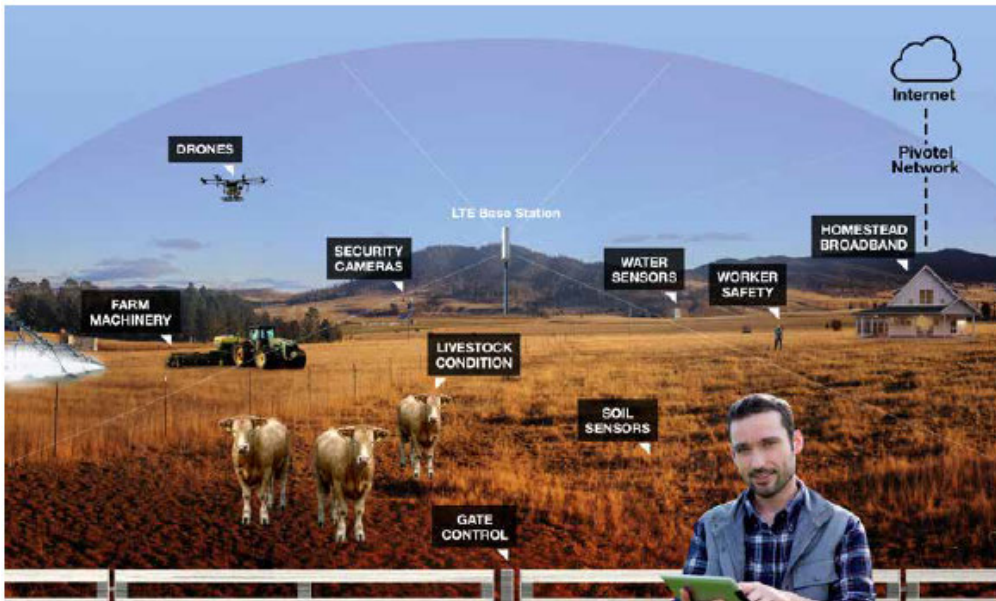
Fig.

Overview of an ecosphere network deployed in an agricultural environment

Pivotel's ecoSphere® network solution has been designed for operation in remote environments where access to radio base station locations is restricted and local power supplies may be unreliable or non-existent. The base stations will be typically installed on guyed mast sites of varying heights.

The ecoSphere® solution allows for ease of transport and assembly of the infrastructure, with many components pre-assembled before being taken to site. As the base station equipment is easily deployable and consumes little power, installation and running costs are significantly reduced.

A typical tower site requires a minimal set of equipment; LTE radio equipment, antenna and microwave units powered by a solar installation. Most RAN equipment is installed at the top of the mast without the need for any large equipment shelter on site. A small cabinet is required on site to house the solar control equipment, power distribution units and routers for remote operational management and control. All site configuration drawings are finalised after the site has been confirmed and the radio design has been established to provide an optimal and acceptable level of coverage.

To address power supply concerns, all base stations are capable of being solar powered with a design criterion of at least three days autonomy. In situations where grid power is available, a minimum of 24 hours battery backup is provided.
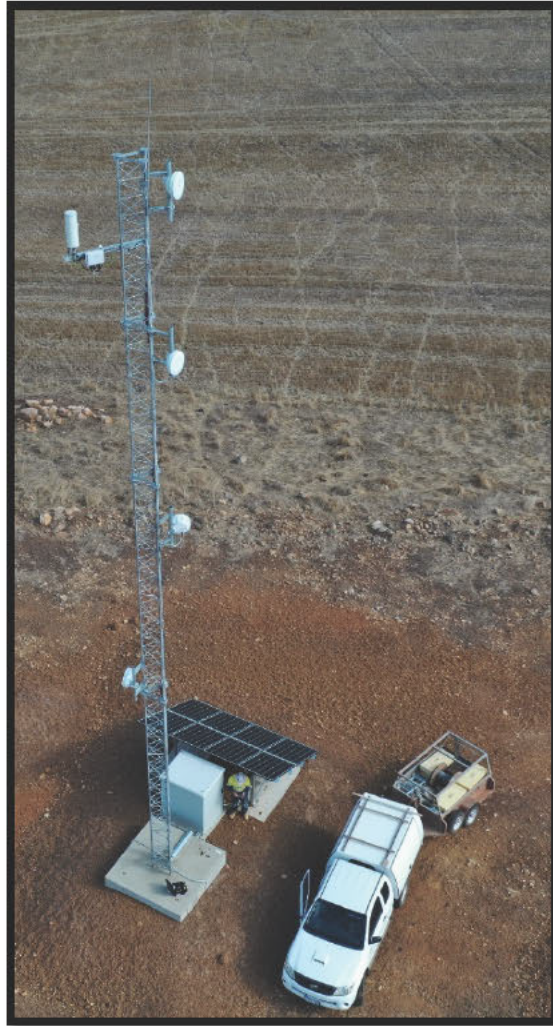
Fig.3 – Typical mast-mounted radio equipment and antenna deployed by Pivotel in Western Australia