2021 Regional Telecommunications Review Secretariat
Department of Infrastructure, Transport, Regional Development and Communications
CANBERRA ACT 2601
30 September 2021

Dear Committee,

NEC appreciates the opportunity to provide a response to the Department's 2021 Regional Telecommunications Review (the Review). NEC is responding to questions 7-13 from the Issues Paper. In summary our recommendations focus on the following themes to improve regional connectivity:

- Encourage investment and deployment of new technologies such as:

    o **5G OpenRAN technologies** - as recently announced at the Quad nations Leaders' Summit on 25 September. OpenRAN is more cost effective to deploy and operate. OpenRAN fosters choice, collaboration and promotes a diverse, resilient, and secure telecommunications ecosystem that is futureproof. This will reduce the barriers of entry of new 4/5G solution providers vs incumbents

    o **MEC** (Multi-Access Edge Computing) facilities that enable cloud based computing capabilities, low-latency and high-bandwidth use cases

- Promote and **incentivise Neutral Host commercial models** that encourage two or more Wireless Carriers to share infrastructure owned by an independent neutral host operator and investor

- Provide further Federal Government telecommunication **incentives for 4/5G infrastructure investors and Wireless Carriers**, to enhance recent regional initiatives, such as RCP, Black Spots and DRNSW Mobile Project

- Provide Federal Government **incentives for new backhaul systems**, that are key for broadband connectivity. Fibre is always preferred, however microwave based or hybrid solutions in regional areas can be more cost effective and fit for purpose

- **Allocate AWL spectrum for shared commercial 4/5G networks and private purposes** e.g. regional Neutral Host (e.g. 5G 600-900MHz) and also private network use (e.g. 5G 3.7-4.2GHz) for industry

- **Implement a national based Public Safety Mobile Broadband (PSMB) solution**, via a hybrid commercial and government OpenRAN 4/5G approach. This approach is complimentary to existing government P-25 voice networks currently used by public safety and government agencies and leverages spectrum allocated (but not yet used) for public safety communications

- **Encourage the sharing of existing useful regional assets for new 4/5G services**, e.g. fibre, towers, power, buildings, railways, energy networks, pipelines and duct systems owned/operated by Utilities, State and Federal government agencies

NEC is an active IoTAA member and we fully endorse IoTAA's response to the Review.

Yours sincerely,

Phil Towers - National 5G Strategy and Business Development Manager

Email Phil.towers@nec.com.au
Ph: 0407911305

NEC's Response to the Issues Paper questions:

Please see NEC response below in *blue font.*

7. What can be done to improve the access and affordability of telecommunications services in regional, rural and remote Indigenous communities?

   Promote and incentivise Neutral Host or other shared infrastructure commercial models (see further information in response to Q9 below) to encourage two or more Wireless Carriers to share infrastructure owned by an independent neutral host operator and investor.

   Provide Federal Government incentives for new backhaul systems, that are key for broadband connectivity. Fibre is always preferred, however microwave based or hybrid solutions in regional areas can be more cost effective and fit for purpose.

   Encourage the sharing of existing useful regional assets for new 4/5G services, e.g. fibre, towers, power, buildings, railways, energy networks, pipelines and duct systems owned/operated by Utilities, State and Federal government agencies.

8. How can investment in telecommunications infrastructure work with other programs and policies to encourage economic development in regional Australia?

   Provide further Federal Government telecommunication incentives for 4/5G infrastructure investors and Wireless Carriers, to enhance recent regional initiatives, such as RCP, Black Spots and DRNSW Mobile Project.

   Allocate AWL spectrum for shared commercial 4/5G networks and private purposes e.g. regional Neutral Host (e.g. 5G 600-900MHz) and also private network use (e.g. 5G 3.7-4.2GHz) for industry.

   The federal government can help by investing in new backhaul systems and encouraging cost effective shared telecommunications facilities.

   In addition to new commercial broadband 4/5G services for regional use the Federal government could work closely with the States to invest in and implement a national based Public Safety Mobile Broadband (PSMB) network. This solution can be cost effectively enabled via a hybrid commercial and government OpenRAN 4/5G approach. This approach is complimentary to existing government P-25 voice networks currently used by public safety and government agencies and leverages spectrum allocated (but not yet used) for public safety communications.

   This solution brings best of both worlds – a robust, resilient and dedicated PSMB in poorly served regional coverage areas, combined with existing 4/5G broadband services in well served metropolitan areas by commercial Wireless Carriers. In regional areas (not well served or blackspots) a government PSMB network can be enabled using the government owned spectrum purposely allocated for public safety by providing:

   - *A 4G wide area coverage layer (850MHz) as an umbrella, along with*

   - *A 5G high-capacity bubbles (4.9GHz) in high traffic small cell areas*

   The solution takes the following considerations into account:

   - *Utilise existing commercial carrier investments where possible, i.e. metro sites (Productivity Commission will also support this concept)*

- *Resolves the long standing PSMB spectrum issue and provides a strategic use case for the existing 4.9GHz spectrum (NSWTA will support)*
- *Complimentary capacity layer approach to the existing P25 voice network investment (ARCIA will support)*
- *Avoids vendor dominance and lock in – OpenRAN helps fulfil this desire*
- *Cost effective commercial handset availability*
- *What is happening internationally that we can do here and does not re-invent the wheel*

Suggested Open RAN PSMB Approach

Use existing 4.9GHz PS spectrum, shared infrastructure investment with MNOs and the Public
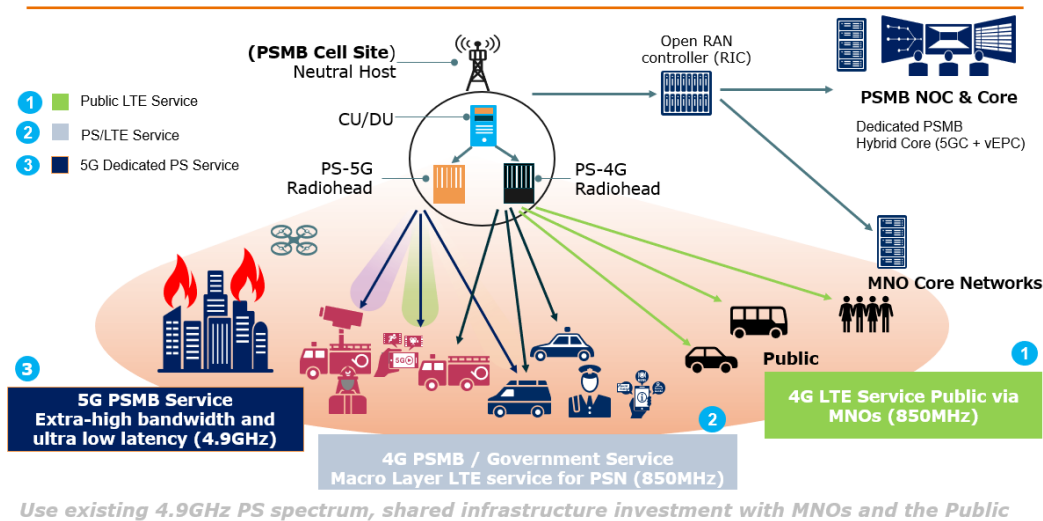
9. What role could innovation, including new models, alternative investors or new ways of doing business, play to encourage investment in regional telecommunications infrastructure? What are the barriers?

Promote and incentivise OpenRAN Neutral Host commercial models that encourage two or more Wireless Carriers to share infrastructure owned by an independent Neutral Host Operator (NHO) and investor. This platform can also provide government PSMB 4/5G services.

The telco infrastructure is deployed, operated, owned and maintained by a NHO, who has a commercial arrangement with each Wireless Carrier on a wholesale basis. This is the NHO's dedicated business, and they can run it more efficiently than the Wireless Carriers'. The NHO holds most of the risk and accountability and is the single point of contact for all the WCs' and the landowner (e.g. city or council); which means simpler contractual arrangements and likely better commercial terms for the landowner.

Typically, a NHO takes a very long term commercial view (e.g. a pension fund, Commercial property group or TowerCo). The NHO invest long term (say 20+ years) and leases its infrastructure to any Wireless Carrier looking to scale up their network capacities, making it more cost effective for each Wireless Carrier. The NHO may also be responsible for Capex refreshes, as well as ongoing operations and maintenance by its dedicated field workforce, who understand all the rules associated with site access and safety.

A neutral host network shares common equipment and infrastructure including;

- *Radio Access Network (RAN) equipment*

- *Base Band Equipment (BBU)*
- *Towers/poles, smart poles*
- *Antenna systems*
- *Power systems*
- *Monitoring systems*
- *Huts/buildings/cabinets*
- *Backhaul/fronthaul transmission equipment*

A neutral host network operator (NHO) can much more readily design, plan and build an optimised common RAN solution, whole of precinct approach; which in turn will provide the Wireless Carriers' the best performance at the lowest cost and least environmental impact.

Councils are becoming overwhelmed with the increasing number of new cell site applications from Wireless Carriers'. A NHO can help manage this process on behalf of the Wireless Carriers' in collaboration with Councils to deliver a more efficient design, approval, build and operational model. A neutral host network also reduces EME, visual and environmental impact and number of cell sites.
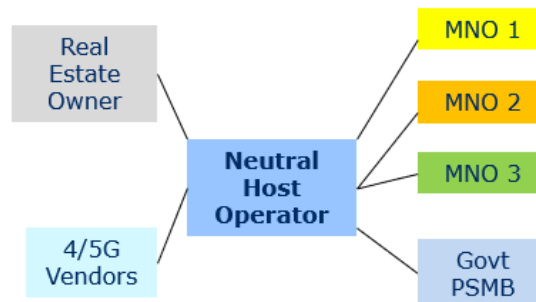
Some countries (e.g. UK and Germany) are encouraging greater private sector participation to explore these possibilities. O-RAN's open ecosystem, coupled with shared infrastructure initiatives like the UK's NeutrORAN project, brings added advantages to make the use cases in low density and remote locations more viable. The NeutrORAN approach, supported by NEC's 5G Centre of Excellence (CoE), aims to not only reduce cost and maximise the value derived from 5G infrastructure, but also open a 5G B2B2x environment for additional ecosystem participants to leverage this open, shared infrastructure.

10. To what extent will new technologies enable significant change to the delivery of telecommunications services in regional Australia over the next 5-10 years? Are there any barriers to accessing these technologies?

New technologies such as 5G and MEC is/ will be significant game changers for telecommunications. Regional areas have challenges, such as low population vs coverage/capacity, which in turn reduces commercial viability.

5G:

- *Is much faster, with higher throughput and lower latency*
- *Provides virtual network slices, on demand*
- *Uses new radio (NR) systems and spectrum to enhance coverage, connection density and capacity using new beamforming and MIMO techniques*
- *Brings cloud computing benefits to wireless networks, accelerating digital transformation*

- Uses edge computing to enable more real time user applications (e.g. E-Health, autonomous cars, AR and UAV)
- Is complimentary with 4G

NEC highly encourages investment and deployment of new technologies including:

- **5G OpenRAN** technologies - as recently announced at the Quad nations Leaders' Summit on 25 September. OpenRAN is more cost effective to deploy and operate. OpenRAN fosters choice, collaboration and promotes a diverse, resilient, and secure telecommunications ecosystem that is futureproof**. This approach will reduce the barriers of entry of new 4/5G solution providers vs incumbents.**

  OpenRAN:

  - Is an open architecture, has more flexibility and enables vendor diversification
  - Drives competition and reduces overall cost and supply chain risk
  - Uses a smaller footprint, cloud based and virtualised using (COTS) commercial off the shelf equipment
  - Provides ~30% cost reduction via cloud based shared resources and is more energy efficient
  - Has an extensive vendor ecosystem fostering innovation
  - Is well suited for neutral host models for two or more Carriers to operate more cost effectively off one common platform

- OpenRAN is also helping to make 5G more economically viable given its advantages of open interfaces and component-level interoperability. The functional splits enabled by OpenRAN architecture offers possibilities to further optimise network design. For example, the ability to aggregate certain RAN functions in Centralized Units (CU's) helps reduce network cost and complexity. Additionally, increased competition driven by open RAN interfaces unleashes innovation and invites new RU vendors to the market, offering operators the ability to deploy best-of-breed solutions. The industry is already seeing several RU reference architectures being developed to bring new RU products to market.

- OpenRAN has also enabled neutral host architectures. In this shared infrastructure setting, a neutral host provides towers and other physical infrastructure and allows different providers access and co-location facilities to connect and offer services. Sharing infrastructure in this way reduces the cost and ideally provides a platform for more players and innovators than would a typical, closed mobile network. Cloud-native 5G RAN enable multi-operator RAN (MORAN) and multi-operator Core network (MOCN) architectures, creating new economically viable alternatives to support rural buildouts.

- **MEC** (Multi-Access Edge Computing) - will enable cloud based computing capabilities, low-latency and high-bandwidth use cases that would not be feasible with standard architecture to regional areas. MEC can host IoT gateways for 5G, LoRaWAN, WiFi, local data processing for AI/ML capability. OpenRAN technology and distributed 5G Core technologies will reduce traffic from regional area to central data centres and save on backhaul costs.

- **Network Slicing -** slicing contributes to resource optimisation from Radio to Core, allowing greater flexibility and granular control of the service tailored to specific requirements of user segments such as local government, residential or enterprise use etc; in turn improving the end-user experience and helping to close the divide.

> - *Private networks* – *Some overseas regulators (e.g. Germany) are setting aside portions of mid-band spectrum to support enterprise customers, local governments and private networks. This is also providing carriers and enterprises the opportunity to provide connectivity in locations which previously were not viable.*

11. How can Government better support the rapid rollout of and investment in new telecommunications solutions in regional areas?

- *Provide further Federal Government telecommunication for incentives for 4/5G infrastructure investors and Wireless Carriers, to enhance recent regional initiatives, such as RCP, Black Spots and DRNSW Mobile Project*

- *Provide funding for 4/5G OpenRAN neutral host interoperability testings and trials for the Wireless Carriers, as well as MEC to accelerate technology adoption. This can be done in line as per the recent 5G Open RAN announcement at the Quad nations Leaders' Summit on 25 September.*

- *Provide Federal Government incentives for new backhaul systems, that are key for broadband connectivity. Fibre is always preferred, however microwave based or hybrid solutions in regional areas can be more cost effective and fit for purpose.*

- *Allocate AWL spectrum for shared commercial 4/5G networks and private purposes e.g. regional Neutral Host (e.g. 5G 600-900MHz) and also private network use (e.g. 5G 3.7-4.2GHz) for industry*

- *Implement a national based Public Safety Mobile Broadband (PSMB) solution, via a hybrid commercial and government OpenRAN 4/5G approach. This approach is complimentary to existing government P-25 voice networks currently used by public safety and government agencies and leverages spectrum allocated (but not yet used) for public safety communications*

- *Encourage the sharing of existing useful regional assets for new 4/5G services, e.g. fibre, towers, power, buildings, railways, energy networks, pipelines and duct systems owned/operated by Utilities, State and Federal government agencies.*

- *Promote and incentivise OpenRAN Neutral Host commercial models that encourage two or more Wireless Carriers to share infrastructure owned by an independent Neutral Host Operator (NHO) and investor. This platform can also provide government PSMB 4/5G services.*

12. How can different levels of Government, the telecommunications industry and regional communities better co-ordinate their efforts to improve telecommunications in regional Australia?

- *Promote and incentivise Neutral Host commercial models that encourage two or more Wireless Carriers to share infrastructure owned by an independent neutral host operator and investor*

- *Provide further Federal Government telecommunication incentives for 4/5G infrastructure investors and Wireless Carriers, to enhance recent regional initiatives, such as RCP, Black Spots and DRNSW Mobile Project*

- *Provide Federal Government incentives for new backhaul systems, that are key for broadband connectivity. Fibre is always preferred, however microwave based or hybrid solutions in regional areas can be more cost effective and fit for purpose*

- *Provide funding for 4/5G OpenRAN neutral host interoperability testings and trials for the Wireless Carriers, as well as MEC to accelerate technology adoption. This can be done in line as per the recent 5G Open RAN announcement at the Quad nations Leaders' Summit on 25 September.*

- *Encourage the sharing of existing useful regional assets for new 4/5G services, e.g. fibre, towers, power, buildings, railways, energy networks, pipelines and duct systems owned/operated by Utilities, State and Federal government agencies*

13. What changes to Government investment programs are required to ensure they continue to be effective in delivering improved telecommunications?

- *Promote and incentivise Neutral Host commercial models that encourage two or more Wireless Carriers to share infrastructure owned by an independent neutral host operator and investor*

- *Provide further Federal Government telecommunication incentives for 4/5G infrastructure investors (e.g. NHO's) and Wireless Carriers, to enhance recent regional initiatives, such as RCP, Black Spots and DRNSW Mobile Project*

- *Design, plan and build an optimised common RAN solution for two or more Wireless Carriers to share infrastructure in a 'whole of precinct approach'. This also provides the Wireless Carriers' the best performance at the lowest cost and least environmental and EME impact.*

- *Provide funding for 4/5G OpenRAN neutral host interoperability testings and trials for the Wireless Carriers, as well as MEC to accelerate technology adoption. This can be done in line as per the recent 5G Open RAN announcement at the Quad nations Leaders' Summit on 25 September.*