OPTUS

Department of Infrastructure, Transport, Regional Development & Communications

Media Reform Green Paper

Modernising television regulation in Australia

Public Version

May 2021

EXECUTIVE SUMMARY

1. Optus welcomes the opportunity to provide this submission in response to the Department of Infrastructure, Transport, Regional Development and Communications' Media Reform Green Paper - *Modernising television regulation in Australia* (the Green Paper).

2. The Green Paper puts forward a range of proposals designed to address some of the most pressing issues for the broadcasting industry today, while establishing a sustainable foundation for the broadcasting industry going forward. This includes delivering a second digital dividend through allocating valuable low-band spectrum for mobile use.

3. Optus welcomes this Green Paper and congratulates the Government for proposing such a forward-looking, future proof reform which will benefit consumers as well as the broadcasting and communications industries.

4. Optus supports the re-allocation of the 600 MHz band to the communications industry. Low-band spectrum is the foundational base of national mobile networks. Mobile networks will increasingly provide the basis for Australia's future digital economy. Additional low-band spectrum will help deliver the potential additional $130 billion of economic growth over the decade to 2030 from the deployment of competitive national 5G services. Increasing the amount of low-band spectrum by more than one third will increase the breadth and quality of 5G networks today and 6G in the future and provide material benefits especially in regional areas.

5. A key consideration to deliver this outcome is whether there are viable alternative methods to deliver content to all Australian households. Optus can confirm that alternatives to traditional terrestrial broadcasting already exist and there will be even more options in the near future. High-speed broadband infrastructure, such as the NBN, high-speed mobile networks, and satellite delivery platforms provide options across metropolitan, regional, rural and remote areas.

6. In particular, soon-to-be-available satellite technology offers significant new capabilities that support mass delivery of broadcasting services. The use of this technology should ensure there are no concerns that any Australian, no matter where they are located, will miss out on having news and content delivered to them.

7. For these reasons, Optus considers the Department's proposals present a win-win opportunity to transition the broadcasting industry to a new sustainable operating model, while allowing more efficient use of a limited resource and still meeting the viewing needs of the Australian public.

8. Optus' submission focuses on alternative content delivery options available to broadcasters in lieu of traditional terrestrial low-band transmission, which can deliver news and content to all Australians, including those in regional and remote Australia.

ALLOCATING 600 MHZ TO MOBILE USE WILL HELP DRIVE $130 BILLION OF ECONOMIC GROWTH

9. Mobile network operators are currently deploying the next generation of high-speed mobile network infrastructure (5G) across Australia. The Green Paper canvasses reallocating the low band spectrum used for traditional terrestrial broadcasting which could then be used for 5G services, particularly in regional areas.

10. Optus considers that the benefits of any such reallocation materially outweigh any potential negatives, as there are existing alternatives that will be able to deliver news and content across Australia – meaning no one needs to miss out on essential information and content.

11. Reallocating the 600 MHz spectrum will assist the Government to support other policy objectives related to the broadcasting industry and ensures the benefits of investing in 5G infrastructure are fully realised – including increased availability of high speed broadband infrastructure across more of Australia (including regional areas) which itself could be used for delivery of news and content.

12. Additional low-band spectrum will promote further competitive investment in regional mobile networks. All Australians, no matter their mobile network, benefit from the presence of alternative competitive networks. The increased competition resulting from the presence of alternative networks provides benefits to not just consumers who have options to move to new providers but also those who remain on the incumbent provider – as the incumbent is forced to respond to this competition by improving their retail offerings.

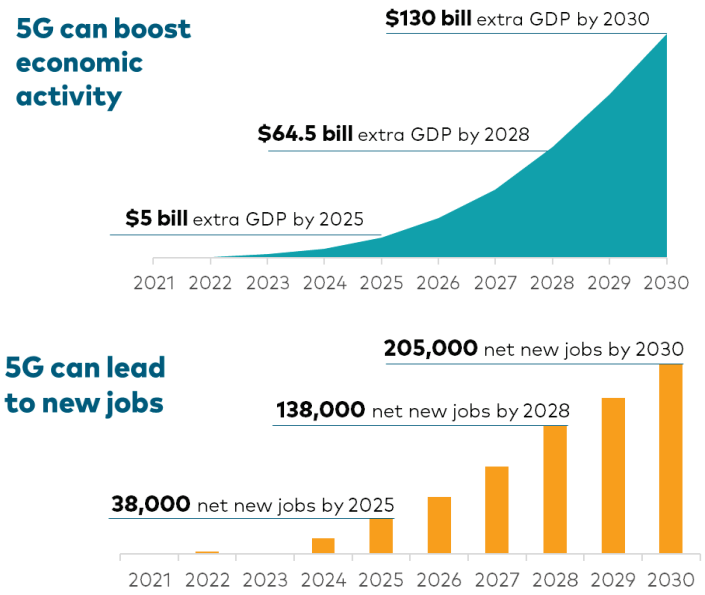
13. Business investment and digitalisation achieved through the use of 5G services can provide a much-needed productivity boost which will be vital in addressing the health, social and economic impacts of the COVID-19 pandemic on Australia. Optus has engaged global experts PwC, using their geo-spatial economic model, to estimate 5G's potential impacts on productivity, jobs and growth spatially as well as by industry.

14. This analysis shows that the competitive national deployment of 5G networks could boost the economy by 1.2% in 2030, equivalent to $36.7 billion in extra economic activity. The cumulative impact over the decade would be $130 billion and 205,000 net new jobs created.

15. The PwC geo-spatial analysis also shows that regional Australia is expected to experience a higher rate of growth from 5G than metropolitan areas. 5G could drive further economic development of regional Australia, with an additional $11.3 billion in economic activity and 8,000 net new jobs in 2030. Over the decade, the cumulative economic impact would be $38 billion and 45,000 net new jobs created.

16. However, Optus sees these potential gains as being far from certain. Maximising the potential of the use of 5G technology to drive digitalisation, productivity and jobs growth requires continual strong infrastructure competition which in turn requires a level playing field. An uneven playing field risks delaying the roll out of competitive 5G networks, which reduces the potential economic benefits of 5G services. Over the decade to 2030, it is estimated that $55 billion of the potential $130 billion of economic gains from 5G — equivalent to 42% — could be lost due to an uncompetitive market and delays in rolling out networks. Future benefits to economic growth and jobs are shown in the following figure.

Figure 1 Potential benefits of competitive national 5G services



Source: PwC

17. As a limited resource, it is imperative to consider how the maximum benefit for Australians can be achieved from spectrum use. Allocating additional low-band spectrum to the market will play a key role in ensuring the competitive deployment of 5G networks and in enabling all Australians, no matter where they live and work, to benefit from the technology that supports the digital services and experiences that customers expect.

600 MHz band planning

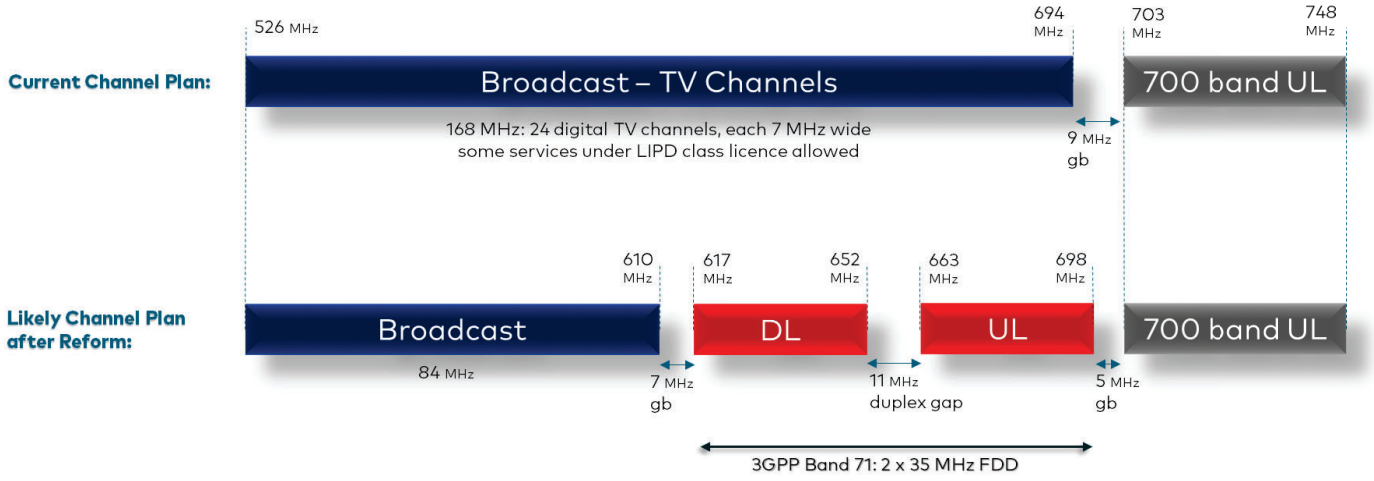
18. Optus supports aligning the 600 MHz band in Australia to the global band 71. This also forms the basis of the deployment of 600 MHz in the US, and we understand is also supported by the Asia-Pacific Telecommunity (APT).

19. 600 MHz band has been allocated to mobile broadband in the USA (since 2017) and Canada (since 2019). For example, T-Mobile 600 MHz band covers 84.6% of the US populations (280 million). Mexico is planning a 600 MHz auction for 2021.

20. In addition to this work, the APT is currently considering reform of the 600 MHz band in order to drive a second digital dividend. We note that New Zealand is considering this band for mobile broadband use in future.

21. At this stage, Optus supports the proposal put forward by the APT. The recommended harmonised band plan for implementation of IMT in the band 470-698 MHz is provided in the following figure.

Figure 2 APT proposal for 600 MHz



Source: APT

22. The proposed 600 MHz APT allocation utilises 81 MHz and provides for 2x35 MHz (70MHz) of usable spectrum with an 11 MHz guard band. It also proposes reverse duplex to allow for its locations adjacent to the 700 MHz band. Optus also notes that network equipment for this band is currently widely available.

23. Providing an additional 70 MHz low-band spectrum will increase the capacity for regional mobile broadband networks by 35% and will promote further investment in the key 4G and 5G technologies required to ensure digital services can be provided across all of Australia. Optus anticipates material economic, employment and consumer benefits from the allocation and use of 600 MHz for mobile technology.

24. Optus supports the Department focusing on transitioning the 600 MHz band to mobile use and to work with the APT to deliver the outcome. We recognise, however, that the allocation of spectrum away from broadcasters will have implications for the manner in which they distribute their content. The rest of this paper discusses the possible distribution methods which would support the media reforms and the restacking of broadcasting spectrum.

ALTERNATIVES TO TERRESTRIAL BROADCASTING ALREADY EXIST AND CAN BE EXPANDED

25. Free-to-Air broadcasters use low-band radio frequency for terrestrial broadcasting. The Green Paper sets out a proposal to transition away from this to help address underlying operating cost issues in the industry.

26. However, a key issue for consideration is what distribution alternatives exist for delivering news and content to Australians, particularly in regional, rural and remote areas.

27. Technologies already exist and are in use that provide options for content to be delivered to metropolitan, regional and remote Australia. This includes high-speed broadband infrastructure, such as, the NBN; 4G and 5G mobile services and satellite services, such as Optus' satellites.

Existing mobile networks can be used for content delivery

28. Online content delivery has improved with developments in compression technology meaning more services can be delivered without the need for significant increases in bandwidth. As high-speed broadband infrastructure such as the NBN and existing and future mobile networks expand coverage, online content delivery becomes available to more Australians.

29. The NBN brings high speed fixed line broadband infrastructure to more than 90% of households. NBN Co has legislated targets to take all reasonable steps to deliver speeds of at least 50Mbps (downstream) and 10Mbps (upstream) to at least 90% of premises in the fixed line footprint. Such speeds are capable of delivering content, including 4K content, to households.

30. NBN Co is in the final stages of connecting premises within the fixed line footprint. If the majority of premises within the fixed line footprint are capable of achieving 50Mbps downstream then IP delivery of content is easily feasible. NBN fixed line services already support delivery of online streaming content and can continue to do so in future.

31. In addition to fixed line networks, current mobile technology and upgrades are able to support content delivery. As a mobile network operator, Optus' existing 4G network already delivers content to Australians – in fact, the majority of data traffic over Optus' existing mobile networks is content delivery. Optus is currently focussed on investing and deploying our 5G network. In its early deployment 5G will increase speeds, decrease latency and generally provide substantially improved mobile connectivity for Australians.

32. Mobile networks, like fixed broadband, are inherently bi-directional and therefore different from pure broadcast systems or the capabilities of satellite broadcasting. In general, this allows for unicast delivery of content meaning each consumer can be offered a unique, personal consumption experience. Current OTT or SVOD systems leverage this aspect for features such as:

    (a) Video on demand

    (b) Start over

    (c) Catch up

    (d) Pause/resume

    (e) Personalised user interfaces with recommendations, watch list, viewing history, search and discovery features, etc.

    (f) Providing alternative video streams to cater to a wide range of devices

    (g) Ability to deliver unique content to individual users such as targeted ads or region-specific content

    (h) Ability to more quickly and efficiently introduce new video codecs, digital rights management or compression

33. Traditional broadcasters are already using OTT broadband delivery in conjunction with free-to-air terrestrial broadcast, typically with separate web experiences and native applications on devices like iPhones or connected smart TVs. Like all OTT implementations the content can be live or on demand and is delivered via a content delivery network. Such applications rely on unicast and bi-directional access networks, whether cellular or fixed broadband.

34. The additional speeds and capacity in 5G will further enhance the viability of using mobile networks for these purposes. There are opportunities in the 5G ecosystem and Optus is actively monitoring and collaborating with the R&D community. These include:

    (a) Mixed mode delivery – ability to use the mobile network for broadcast, multicast or unicast delivery and transition between modes. See https://5g-xcast.eu for examples of activities in Europe.

    (b) Network slicing – introducing the ability to segregate a portion of the network for specific purpose, e.g. for video delivery generally or even as a reserved replacement FTA service.

    (c) CDN augmentation, unicast conversion – leveraging a fixed wireless modem as an actual edge node in a CDN, allowing for broadcast distribution to local storage and subsequent unicast replay of content to reduce CDN distribution costs for commonly consumed, very popular content.

35. Optus will continue to monitor and explore these technical advances within the 5G community. The prospects in terms of capabilities and features are clearly significant. However, without additional spectrum mobile networks will be limited in its ability to deliver additional content demand. Optus submits that the upcoming developments in 5G technology, coupled with greater spectrum allocation (including 600 MHz), will enable mobile networks to take up the extra demand due to the transition away from traditional terrestrial broadcasting delivery.

Satellite is a viable alternative where IP delivery is not possible

36. For areas not able to receive broadband services capable of supporting online content delivery, satellite represents a viable alternative news and content delivery platform for rural and remote Australians. Satellite services already exist that can broadcast content directly to homes and improvements in satellite delivery means content can be distributed more efficiently to more Australians.

37. Optus is the leading supplier of satellite communication and broadcast services in Australia, providing Direct-to-home (DTH) services for over 35 years. In fact, Optus is the only network provider in Australia to own and operate its own fleet of satellites, with the largest fleet of satellites in Australia and New Zealand. Since 1985, Optus has successfully launched ten satellites and operated thirteen spacecraft. The current satellite fleet consists of five geostationary satellites providing satellite services across Australia and New Zealand and to McMurdo Sound in the Antarctic.

38. Optus provides a number of major satellite services throughout Australia and New Zealand including:

    (a) Free-to-air DTH television broadcasting (Viewer Access Satellite Television (VAST) services and TVNZ)

    (b) Pay DTH television broadcasting (Foxtel and SkyNZ)

    (c) Television Distribution to hill top terrestrial transmitter towers

    (d) Voice and data Satellite Services

    (e) Wholesale Consumer Satellite Broadband (NZ)

    (f) Emergency Services

    (g) Mobile Black Spot backhaul connectivity

(h) Mobile Satellite Services

39. The existing VAST service already delivers reliable free-to-air television and radio services to people in metropolitan, regional and remote Australia. It is already a viable alternative to traditional terrestrial broadcasting.

VAST services already deliver Direct-to-home content

40. Viewers who do not currently have adequate reception of terrestrial digital television broadcasting services can access VAST services. Funded by the Australian Government, VAST provides access to a suite of metropolitan-equivalent broadcasting services to viewers across Australia with a specific remit in remote areas and in terrestrial television 'black spots' areas.

41. Optus is the organisation responsible for delivering the VAST service. Optus Satellite has been delivering Direct-to-home satellite television to regional and remote Australia through the current VAST service, the previous HACBSS (Homestead and Community Broadcast Satellite Service) and RABS (Remote Area Broadcast Service) continuously since 1985.

42. VAST commenced operation in 2010 and has been an outstanding success in delivering reliable free-to-air television and radio services to people living and travelling in regional, remote, rural and blackspot locations throughout Australia where there is no terrestrial service available.

43. The service provides 100% coverage throughout mainland Australia and Tasmania[1] and can be received Direct-to-home via a 65cm satellite antenna and set top box (STB). Over the life of the service, Optus has activated over 350,000 registered VAST STBs[2] and Optus sees approximately 600 new activations per week on average.

44. As well as DTH broadcasting, VAST serves the dual purpose of providing a television distribution platform by feeding program content to terrestrial television transmitter sites throughout regional and remote Australia.

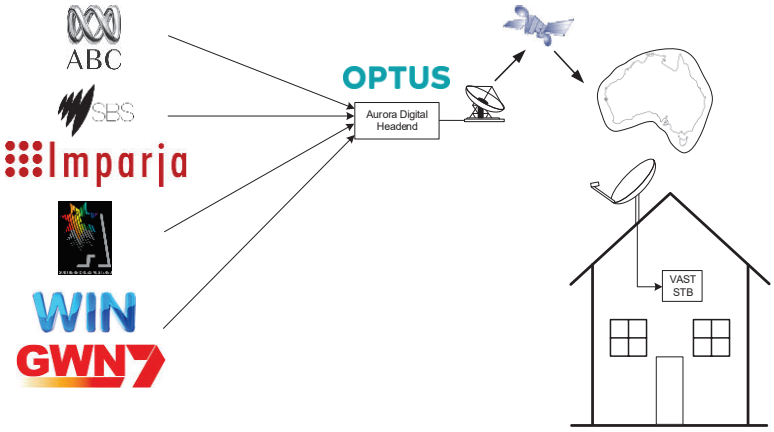
45. The VAST service includes approximately 80 television channels (60x SD, 20x HD) and 100 radio channels from the national broadcasters (ABC & SBS), commercial & community broadcasters and open narrowcasters. It operates on a platform called Aurora Digital and is broadcasting across two satellites; the Optus 10 and Optus D3 satellites, both located at the Optus Australian orbital filing of 156°E. The two satellites provide a level of redundancy and flexible functionality.

46. The following diagram simply illustrates delivery using the existing Optus satellite VAST service.

[1] Coverage depends on clear line-of-site to the Optus 10 and D3 satellites with no obstructions.

[2] The number of registered VAST STBs is based on data extracted from Optus' CA system.

Figure 3 Existing Optus VAST service



Source: Optus

47. Optus is committed to its satellite operations and is preparing for future operations with the proposed launch of a software defined satellite which has significant technological improvements on existing satellites. The new “Optus 11” satellite scheduled for launch in mid-2023, is designed primarily for DTH in New Zealand.

A new Optus 12 satellite designed for Australia can address issues with existing satellites

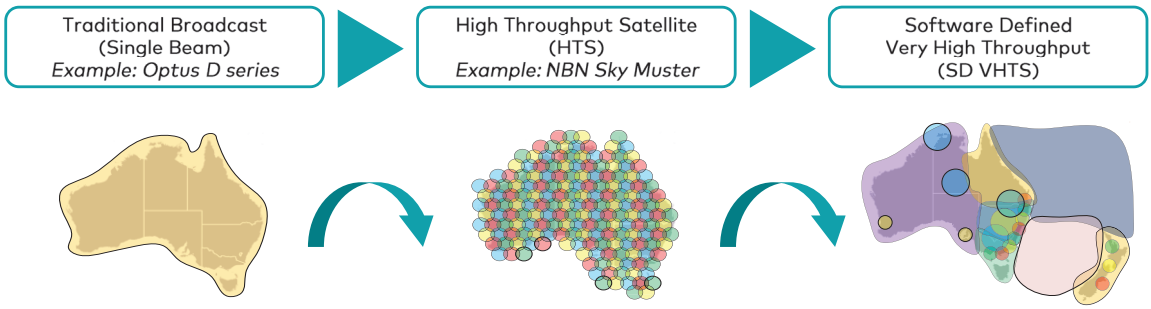
48. Optus is currently planning the ‘Optus 12’ satellite which promises to address some of the concerns with existing satellite delivery. The Optus 12 satellite is designed to replace the VAST satellite Optus D3 at 156°E.

49. Currently, some existing satellite delivery can be subject to congestion due to the use of fixed beams targeted at specific places with a set capacity. Large usage can cause congestion on the beams and affect performance. NBN Satellite broadband services have experienced these issues in the past.

50. Importantly, the new Optus satellites have the capability to address some of the key concerns with satellite delivery. The software-defined satellite can provide both flexible concurrent broadcast and broadband services via a very high throughput satellite (SD-VHTS) design. The SD-VHTS design will provide unprecedented levels of flexibility in terms of beam shaping, spectrum and power configuration.

51. The most significant benefit is that unlike existing satellites, software-defined beams have much greater flexibility. The greater flexibility can be seen in the following table.

Figure 4 Comparison of traditional satellite capabilities with SD-VHTS satellite



	Traditional Optus Satellite	HTS Design	Optus Software-defined VHTS Design at 156°E
Market	Designed for Broadcast	Designed for Broadband	Designed for broadcast, broadband or both simultaneously
Beams	Large beams, fixed footprint	Spot beams, fixed footprint	Spot beams, specific beam shaping, size and power are remotely configurable in orbit
Spectrum	Fixed to beam design	Fixed to spot beam design	Spectrum reused multiple times with beam configuration and can be remotely reconfigured in orbit as requirements change
Flexibility	Unable to modify after launch	Unable to modify after launch	Highly flexible – payload can be reconfigured in orbit to meet demand

Source: Optus

52. The comparison above shows there are number of benefits of the new SD-VHTS satellite as compared with existing satellites, including:

    (a) Simultaneous use of beams for broadcast and broadband services, rather than being restricted to only broadcast or only broadband; and

    (b) Increased flexibility from being able to move spot beams and configure beams remotely (including in relation to how the spectrum is used).

53. The flexibility afforded by a SD-VHTS satellite provides an exciting opportunity to overcome issues with existing services. That is, where congestion can occur due to user demand and affect performance of satellite services (this has been particularly noticeable in the past with satellite broadband services).

54. The SD-VHTS satellite can address existing congestion issues by moving beams in response to increases in user demand. This can help ensure there is sufficient capacity for users in areas as required.

55. **[CiC]**

56. Further details on Optus' plans are contained at Appendix A to this submission.

"Gov-Sat" solution could address broadcasting, broadband and voice regional policy priorities

57. Optus considers the approach canvassed in the Green Paper – to address underlying operating model issues for a sustainable broadcasting industry – also presents an opportunity to address policy priorities in the telecommunications industry.

58. Policy priorities within broadcasting (delivering content) and telecommunications (universal voice and broadband services) could be addressed holistically and efficiently addressed by the same technical solution. An efficient measure that can address multiple policy issues offers a future proof option for both broadcasting and telecommunications.

59. Following discussions with several Commonwealth Government agencies, Optus suggests that various Government needs, and capabilities would benefit from a multiple payload hosting at GEO orbit.

60. Optus suggests that a single Australian-based and flown Government satellite (Gov-Sat) would be of great benefit to Australia. Each agency has its own requirements, but does not have experience or capabilities in launching, flying and operating spacecraft.

61. Optus has the ability to take the multiple requirements and combine into a single spacecraft which it can procure, manage and operate. Optus has done this since the inception of AUSSAT – Australia's first satellite company – and we continue this legacy today for the Australian Defence Force on Optus C1.

62. Optus terms this the Optus Multi-mission Gov-Sat. Such a program requires significant financial support and collaboration. As with any program, Optus is willing to consider appropriate investment in its involvement in such an initiative.

63. Optus sees material efficiency gains to bring all Government services togethers and to fund a dedicated "Gov-Sat" solution.

64. Optus today delivers voice and broadband services via the same satellite that delivers VAST – Optus D3. Indeed, several Government funded, Optus satellite delivered, mobile blackspot sites are also delivered on this same Optus D3 satellite. Today via satellite, we provide the Government-funded VAST service, sites built under the Mobile Blackspot Program, and we are also trialling solutions under the Alterative Voice Services Trial. Optus sees opportunity to continue to provide satellite-based services which address the ongoing needs of regional Australians.

65. One of the key benefits of the proposed Gov-Sat solution here is a single satellite antenna installation reducing costs of up to three separate installations that may be required to deliver a broadband, broadcast and voice solution via the current policies.

66. The Optus proposed Gov-Sat solution could be located within Optus orbital filings, where we have considered future scope and spectrum, particularly related to future satellite designs, for example with Ka-Band, Q and V Band, on top of our more resilient Ku-Band.

67. Effectively, as proposed in our discussions with Government, such a satellite could be defined as a USG satellite – providing simultaneous voice and broadband. As NBN has evidenced, the SkyMuster platform was not designed for voice services, and as evidenced by the Review of the VAST service, NBN SkyMuster is not designed for streaming of television services. Optus could support regional USG broadband requirements, to those households not currently covered by commercial terrestrial network.

68. Optus, with its 35 years' experience successfully delivering satellite services, can and would ensure all these services are designed to be fit-for-purpose. A single very high-throughput software-defined satellite will deliver robust voice, television and broadband services to remote, rural and regional Australians via a single antenna and connection.

69. Further, mobile services can also be facilitated on this same solution – as currently being demonstrated under trial in our Alternative Voice Service Trial offering located in the Primrose Valley. Additionally, Government funding synergies can be achieved with the

addition of payloads such as the Geoscience Australia SBAS required hosted payload, or an Earth Observation payload for integration into a Bushfire Warning System.

70. Such a satellite(s) could be seen with a view to partial or full replacement of the NBN SkyMuster services in the years to come, as the NBN seeks to replace its aging satellites. Optus welcomes further detailed discussions with Government on how we can work collaboratively to provide Government Services, broadcasting, voice and broadband services to regional and remote Australia.