# ACMA submission into ACCC declaration inquiry

## Executive summary

The ACMA welcomes the opportunity to make a submission to the ACCC's Superfast Broadband Access Service declaration inquiry Discussion Paper.

The ACMA submission is not intended to express an opinion in relation to the need for, or competition benefit of a declaration. Rather, its purpose is:

(1) to identify various technical and operational issues relevant to a possible SBAS declaration, including the definition of such a declared service;

(2) highlight specific regulatory issues within the remit of the ACMA and relevant to the deployment of superfast broadband carriage services; and

(3) to explain the potential relationship between an SBAS declaration and the technical work being undertaken by Communications Alliance Working Committee 58.

The submission is divided into two parts:

- Part 1 sets out the background to the ACMA's submission, including regulatory context for deployment of superfast carriage networks, and the technical and operational characteristics of superfast carriage networks.
- Part 2 contains the ACMA's answers to specific questions asked by the ACCC in its Discussion Paper.

## Part 1: Regulatory and technical context

The regulatory context for superfast carriage systems and networks comprises:

- regulatory arrangements specific to the supply of superfast carriage services (i.e. level-playing field arrangements); and
- other legislative and regulatory arrangements ancillary to the deployment of superfast carriage systems and networks.

*Level playing field arrangements*

The *Telecommunications Act 1997 (*Telco Act) and the *Competition and Consumer Act 2010* (the CCA) contain a number of provisions that regulate non-NBN telecommunications networks that are capable of supplying superfast carriage services. The intended effect of these provisions are to ensure that the NBN operates on a level playing field with the operators of these other telecommunications networks.

The current regulatory arrangements for superfast carriage services can be summarised as follows:

- Parts 7 and 8 of the Telco Act require certain superfast carriage networks to be operated on a wholesale-only basis, and to be used to offer a Layer 2 bitstream service.
- Under subsection 152AL (3C) of the *Competition and Consumer Act 2010* (the CCA), the ACCC has declared a local bitstream access service (LBAS) as a 'declared service'. The effect of the LBAS declaration is to require access providers to supply a layer 2 bitstream service in accordance with the standard access obligations set out in the CCA.

- In January 2015 the Minister made a carrier licence condition requiring carriers supplying superfast carriage services (regardless of when they were built) to meet certain access, pricing and functional separation requirements. The carrier licence condition is intended to mimic the level-playing field arrangements in Parts 7 and 8 of the Telco Act.

Proposed legislative changes to level playing field arrangements

The government has announced that it intends to introduce legislative changes that will affect the current provision of non-*nbn* fixed-line telecommunication access networks. These include the repeal of Part 7 and the introduction of amendments to Part 8 of the Telco Act to remove the requirement to offer a layer 2 bitstream service and remove the 1km exemption for networks covered by the legislation.[1] In addition, the *Carrier Licence Conditions (Networks supplying Superfast Carriage Services to Residential Customers) Declaration 2014* (CLC), which currently places obligations on carriers that supply superfast carriage services (regardless of when they were built) to meet certain access, pricing and functional separation, is expected to expire on 31 December 2016.

The implication of the impending revocation of Part 7 of the Telco Act and the expiry of the CLC is that operators of superfast networks will no longer be required to supply a layer 2 bitstream service. Without any obligation for network operators to supply a layer 2 bitstream service, the LBAS declaration will no longer have any practical effect.

*Other regulatory arrangements ancillary to deployment of superfast carriage systems and networks*

In addition to the level playing field arrangements described above, the deployment of superfast carriage networks is supported by a number of other regulatory arrangements. These are:

- **Carrier powers and immunities**: Schedule 3 of the Telco Act provides carriers with certain powers and immunities to install and maintain low-impact facilities. In combination with the *Telecommunications (Low Impact Facilities) Determination 1997*, the effect of Schedule 3 is to allow carriers to install certain subscriber connection equipment (e.g. DSL access multiplexers – DSLAMs) in MDUs. Prior to installing such a low impact facility, the carrier must provide a Land Access and Activity Notice (LAAN) to the owner/ occupier of the building.[2]
- **Customer equipment**: Part 21 of the Telecommunications Act allows for the ACMA to make technical standards and labelling requirements that apply to specified customer equipment that is installed or used on, or intended for installation on, the customer side of the network boundary. Because a DSLAM can be installed on the customer side of the network boundary (i.e. on the customer side of the main distribution frame located in the building), a DSLAM is subject to the ACMA's technical standards and labelling requirements.
- **Customer cabling**: The installation and maintenance of customer cabling is subject to the ACMA's Cabling Provider Rules. The Cabling Provider Rules require customer cabling work to be performed by a registered cabling provider, and undertaken in accordance with the Wiring Rules. The focus of the Cabling Provider Rules is on safety aspects of cabling work, rather than the technical performance of services supplied over customer cabling. Customer cabling is typically owned by the end-user of a premises. In the case of an MDU, the ownership of the customer cabling will depend on the contractual arrangement between the end-user and the owner of the building. In some situations, a carrier may also choose to

[1] Parts 7 and 8 contain exemptions that allow for superfast networks that existed before 1 January 2011 to be extended by less than 1km.

deploy their own cabling within the building to provide services to end-users. In this situation, the cabling is still considered to be 'customer cabling', but is owned by the carrier.

- **Part 6 codes**: Under Part 6 of the Telco Act, the ACMA may, subject to certain conditions, register an industry code. Compliance with a registered code is voluntary; however the ACMA may issue a direction to a member of the section of the telecommunications industry covered by the code to comply with the code. Compliance with a warning or direction issued by the ACMA is mandatory. The deployment of systems using the unconditional local loop service (ULLS) is subject to the industry code *C559:2012 Unconditioned Local Loop Service (ULLS) Network Deployment*. C559 does not currently provide for the deployment of superfast carriage systems (e.g. VDSL, VDSL2 and G.fast) systems, nor does it apply to in-building xDSL deployments. Communications Alliance Working Committee 58 is currently developing a new industry code to support the deployment of superfast carriage systems, including in relation to in-building deployments.

*Technical and operational characteristics of superfast carriage networks*

While a range of access technologies are available for use in superfast carriage networks, the focus of this submission is on services supplied over twisted metallic pair cabling via fibre-to-the-node (FTTN) and fibre-to-the-basement (FTTB) technologies. This is because FTTN and FTTB (especially the latter) has been the principal focus of competition policy and associated technical discussions.

Categories of superfast network deployment (FTTN/B)

In a FTTN network, optical fibre is deployed from a point in the network (typically, from the local exchange) to a DSLAM housed in a kerb-side cabinet. (FTTdp – fibre-to-the-distribution point – is a variation on FTTN, where the service is fed from a location (such as the street lead-in pit) closer to the end-user premises.)

In a FTTB network, the optical fibre from the network extends to a physical cabinet housing equipment such as a DSLAM, usually located within the communications room of a multi-dwelling unit (MDU) building. Existing copper cabling from the DSLAM (rather than optical fibre) then provides connectivity between the DSLAM and end-user. The reuse of the existing copper cabling reduces the cost and time to deploy the network.

Figure 1 illustrates the three broad categories of deployment of superfast broadband access services using FTTN/B:

(1) **Scenario 1**: services deployed from a kerb-side node (typically located adjacent to an existing pillar in the local access network) to an end-user located in a single-dwelling unit;

[2] A LAAN cannot purport to restrict other carriers' access to the building, or the supply of carriage services by a competing carrier or carriage service provider to end-users located within the building. However, because of the technical (i.e. interference) characteristics of superfast carriage systems, the practical effect of a carrier deploying a superfast carriage systems in a MDU is to limit the scope for other carriers to deploy competing superfast carriage systems, where those services are carried in the same cable sheath as the first carrier's system.

(2) **Scenario 2**: services deployed from a kerb-side node to one or more end-users located in a multi-dwelling unit (e.g. apartment block, office building);

(3) **Scenario 3**: services deployed from a digital subscriber line (DSL) access multiplexer installed in the basement of a multi-dwelling unit to one or more end-users located in that MDU.

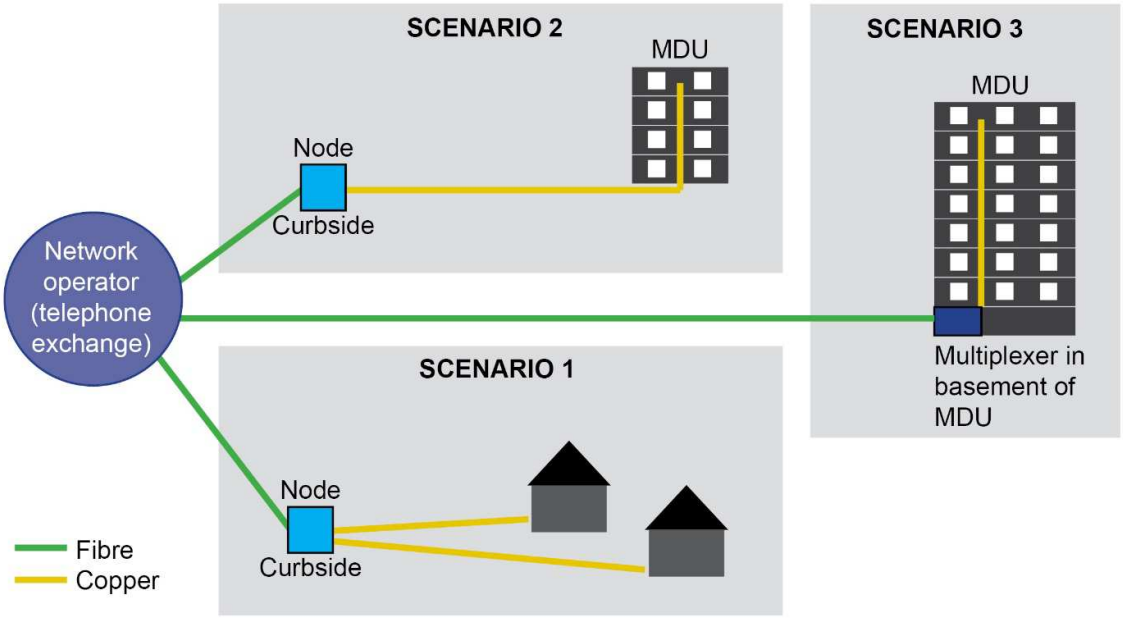


*Figure 1: Different FTTN/B deployment scenarios*

For Scenario 1 and Scenario 2, a competing provider may gain access to the sub-loop at the infrastructure layer by deploying its own network equipment at, or immediately adjacent to the location of the first provider's equipment (i.e. DSLAM) in the street (i.e. sub-loop unbundling or sub-loop access). Alternatively, a competing provider may seek to gain access to the first provider's wholesale broadband service, and retail that service to end-users.

For Scenario 3, a provider may install its own equipment in the building (typically, in the communications room of the building) and use the existing transmission infrastructure (i.e. cabling) in the building to provide services to end-users. Alternatively, a provider may choose to deploy its own transmission infrastructure (which could be metallic twisted pair, optical fibre, Category 5/6 etc) from its equipment to end-users. However, given the costs involved in deploying alternative infrastructure, providers are likely to prefer to use existing cabling where available. Alternatively, a competing provider may seek to gain access to the first provider's wholesale broadband service, and retail that service to end-users.

The ACMA notes that Scenario 3 deployments remain the primary focus of government policy considerations and industry technical discussions.

<u>VDSL technologies</u>

VDSL2 is one of the technologies proposed for deployment in FTTN and FTTB networks both by nbn, and other competing providers. While VDSL2 is able to provide very high broadband speeds in optimum conditions, its performance is very susceptible to the crosstalk (interference) that may occur between twisted copper pairs that share the same cable sheath. As signals are being

transmitted along a twisted copper pair, some of the signal may "leak" out causing interference to signals travelling along an adjoining or nearby copper pair.

There are broadly two types of VDSL2 – vectored and unvectored. In contrast to vectored VDSL2, non-vectored VDSL2 can co-exist with other technologies deployed from either the node, or from the exchange. However, such co-existence requires the VDSL 2 service to be 'shaped', by reducing the transmit power levels. In practice, this means the (shaped) VDSL2 service is likely to achieve a substantially lower speed.

The effects of crosstalk have traditionally been managed via deployment rules governing spectral usage and transmit power levels. However, this technique is not as effective as a relatively new interference cancellation technique known as vectoring. VDSL2 supports the use of vectoring and, when implemented appropriately, can provide the VDSL2 service with optimal operating conditions (i.e. achieve optimum upload and download speeds). Vectoring works by calculating the interference present on the copper line and then sending an opposing signal to cancel out that interference. Without vectoring, the presence of crosstalk reduces the capacity of the copper cable and can severely degrade the performance of VDSL2 services.

Vectored VDSL2 seeks to further mitigate the effects of cross-talk within a cable sheath, beyond that achievable with unvectored VDSL2. According to ITU-T Recommendation G993.5, the greatest benefit from vectoring arises when there is one system managing all of the cable pairs in each cable (i.e. effectively a single infrastructure provider of local fixed broadband services for each cable). Deployment of more than a single DSLAM or the presence of other access technologies in a cable (such as ISDN, ADSL2+ and SHDSL – all commonly deployed today) may significantly reduce the benefits of vectoring for VDSL2 end users by significantly reducing download and upload rates (such that the rates are similar to VDSL2 without vectoring), or increase service dropouts. In practice, this would mean that for FTTN, technical performance is optimised only if a single carrier connects the lines from the node to premises or, in the case of FTTB, only a single carrier deploys a system that accesses internal cabling in the premises.

As a consequence, there will be an advantage for any carrier that is the first to connect vectored VDSL2, including to a multi-dwelling unit (MDU) or business centre, and which has first access to the internal cabling. Although a second carrier could conceivably seek to deploy vectored VDSL2 from the same location and use the same cable sheath, this would lead to a significant reduction in technical performance for all vectored VDSL2 networks running from that node. In a FTTB scenario, building owners may be reluctant to agree to allow a second carrier to connect equipment on this basis, because tenants are unlikely to want providers offering inferior quality services.[3]

Bottleneck characteristics of superfast carriage networks

The physical and technical characteristics of VDSL2 (and successor technologies such as G.fast) have the consequence of impeding the ability of providers to compete at the infrastructure level. This situation will occur where a competing provider proposes to deploy its own equipment and provide services in the same cable sheath as another provider. In this context, the ACMA notes that superfast carriage networks deployed using vectored VDSL2 and successor technologies can have

[3] http://www.communications.gov.au/__data/assets/pdf_file/0017/243521/Early-assessment-RIS-13-Oct-14-public.pdf

bottleneck characteristics.

In this scenario, end-users residing in MDUs could be effectively restricted to acquiring broadband services via a single network provider and, in the absence of any wholesale arrangements, reduce the competitive outcomes for end-users. This issue has previously been highlighted by Communications Alliance in its submission to the Vertigan Review.[4]

While technologies such as cross-DSLAM vectoring potentially allow for co-existence of vectored VDSL2 systems, those technologies are not currently sufficiently mature to cater for multiple vectored VDSL systems carried in the same cable sheath, and deployed from separate carrier infrastructure (ie. DSLAM).

Relationship between Communications Alliance Working 58 activity and ACCC inquiry

The technical work being undertaken by Communications Alliance Working Committee 58 is intended to facilitate the deployment of competing superfast carriage systems (especially in MDU/campus situations) by developing technical rules that, where complied with by system providers, can allow those competing systems to co-exist while achieving minimum upload and download speeds.

The relationship between the Working Committee 58 technical activity and the ACCC's declaration inquiry is indirect: the technical rules are intended to facilitate infrastructure competition – especially where services are supplied to MDUs – where such infrastructure competition is not feasible for technical reasons, an ACCC superfast carriage service declaration would allow RSPs to compete at the service layer, where access to the underlying broadband infrastructure is provided to RSPs on a non-discriminatory basis.

The ACMA also notes that the technical code being developed by Working Committee 58 could also – if desired by industry – facilitate infrastructure competition in FTTN by providing the technical basis for FTTN systems deployed in the same cable sheath to co-exist. However, the ACMA notes that the owner of the local access network would also only be required to provide unbundled access to the sub-loop if that service was covered by an ACCC service description (such as the one being considered in this discussion paper).

## Part 2: ACMA observations on questions contained in ACCC discussion paper

The ACMA's comments on the questions contained in the ACCC discussion paper are limited to questions 1 (market definition), 3 (bottleneck characteristics of superfast carriage networks) and 5 (SBAS service description).

[4] http://www.commsalliance.com.au/__data/assets/pdf_file/0004/43618/CA-Vertigan-Panel-Submission-final.pdf

*1. What are the relevant markets for the purpose of this Discussion Paper and the application of the LTIE test?*

The ACMA does not have a view on the definition of the relevant market for the purposes of the inquiry. However, the ACMA notes that particular competition policy issues have arisen in relation to the supply of FTTB services, and suggests that the policy rationale for a service description be considered specifically in the context of the supply FTTB services to end-users. The ACMA also notes that there is likely to be greater demand for infrastructure-competition in FTTB deployments, compared with other types of deployments.

*3. Do any superfast broadband networks represent, or are they likely to represent in the future, a bottleneck for providing broadband services to end-users? Please give reasons referring to the state of competition in broadband (and other relevant) markets, any-to-any connectivity and the efficient use and investment in infrastructure.*

The ACMA notes that the physical characteristics of VDSL2 and successor technologies means that superfast broadband networks using FTTN and FTTB have the potential to become bottlenecks for providing broadband services to end-users. This is because the physical characteristics of VDSL2 and successor technologies limit the potential for competing providers to achieve desired technical performance rates by deploying competing infrastructure that uses metallic cable carried in the same cable sheath as other providers. The ACMA notes that an alternative to the use of metallic cable in a common cable sheath is to deploy alternative transmission infrastructure (e.g. optical fibre, Category 5/6).

*5. If the ACCC were to declare a superfast broadband access service:*

*(a) What would be an appropriate service description?*

The ACMA believes that an appropriate service description should be defined by reference to:

- **Connectivity**: i.e. a point-to-point broadband service between customer equipment used by the end-user to access the service and a defined point located within the access provider's network.
- **Physical infrastructure**: e.g. the physical transmission infrastructure (e.g. metallic twisted copper pair) and the equipment used by the access provider to provide the superfast broadband access service.
- **Functional capability**: the expected capability of the broadband service should meet minimum upload and download speeds.

The ACMA notes that the scope of the declared service will be determined to some extent by the functional elements specified in the service description. For example, specifying a point located on or adjacent to the end-user side of the access seeker's equipment (such as a DSLAM) will effectively require unbundling of the access seeker's broadband service. It will be important, therefore, that the application of any service description is considered in the context of the different deployment scenarios, and whether those scenarios should be caught by a service description. Given the current competition policy and technical focus on FTTB deployments, it may be worth considering limiting the scope of the service description specifically to FTTB deployment scenarios.

The ACMA cautions against the use of the network boundary concept as an explicit element in a service description. This is for two reasons: firstly, in the case of the majority of FTTB networks, the superfast carriage service is supplied over physical infrastructure on the customer side of the network boundary; secondly, because section 22 of the Telco Act allows for an end-user to negotiate an alternative network boundary point with a carrier or carriage service provider, it would open to an access provider to circumvent the application of the access regime by agreeing to a network boundary point that has the effect of limiting the application of the declared service.

The ACMA notes that some submissions to the Vertigan Review have suggested that in-building cabling should be 'regulated', including by means of the access regime in the CCA. The ACMA notes that, because in-building customer cabling is typically owned by, or managed on behalf of, end-users/tenants in the building, requiring access to the physical (i.e. unbundled) cabling in the building may involve extending the access regime to building owners and/or tenants.

*(b) Should the service description be technology neutral?*

The ACMA believes that any service description for a superfast broadband access service should be, as far as possible, technology neutral. To this end, the definition should focus on the functional elements of the service description and network deployment, and not reference specific technologies (e.g. VDSL2), or refer specifically to a 'Layer 2 bitstream' service. The ACMA notes, however, that because not all access technologies (e.g. optical fibre) have the same technical characteristics as VDSL2 and successor technologies, the bottleneck characteristics of those other technologies may be different to VDSL2 and its successors. Therefore, it will be necessary to consider the application of any service description in relation to a range of technologies to ensure the description is appropriately focused.

*(c) What specifications, if any, should the service description include? For example, should the service description include specifications as to quality of service (for instance, speed)?*

Other than specifying minimum speeds (eg. upload and download), the ACMA does not believe that the service description should include technical performance criteria (e.g. quality of service parameters such as packet loss, jitter etc.). Specification of such parameters in the service description may unnecessarily limit the scope of services regulated under a service declaration. However, the ACMA notes that such technical criteria could be included in contractual arrangements between an access provider and an access seeker.

*(d) Which types of services should be captured and/or excluded by the service description? Please give reasons, referring to the implications for competition, any-to-any connectivity (where relevant) and the efficient use of and investment in infrastructure.*

The ACMA notes that there may be networks previously deployed in 'closed' environments (e.g. certain campus-based local area networks) that arguably should not be covered by a declaration. Working Committee 58 has recently been considering such networks, with a view to excluding those networks from the scope of the proposed VDSL2 technical code. The characteristics of these types of network appear to include:

- Physical and technological elements: e.g. Ethernet carried over Category 5/6 cabling.
- Type and scope of service offering: e.g. carriage services supplied to a single customer located on a distinct place (which carriage services are accessed by end-users at that distinct place).

The ACMA suggests that, as an alternative to developing a very precise service description, it may be preferable for the ACCC to consider making a class exemption from the service description.

*(e) Do you consider that the LBAS service description is an appropriate starting point for the SBAS service description?*

The ACMA considers the LBAS is an appropriate starting point for a service description. However, the ACMA suggests that:

- the service description not rely specifically on the 'Layer 2 bitstream service' concept described in the Telecommunications Act (and referenced in section 152AC of the CCA);
- the concept of a 'user network interface' be considered further in the context of the application of a service declaration to FTTB deployments. As noted above, the ACMA cautions against using the concept of 'network boundary point' in the service description.