eHealth Implementation Group
Australian Government Department of Health and Ageing

Response to

'Broadband Connect and Clever Networks: Supporting Investment In Sustainable Broadband Infrastructure - Discussion Paper'
Provided to DCITA
18 January 2006

DoHA Policy Context

The Connect Australia package represents a significant and unique opportunity to transform Australia's telecommunications industry, especially as it relates to the delivery of broadband services. Broadband is a key enabler for eHealth and for improving access to appropriate information, at the point of care, in Australia's health system. Healthcare is an information-intensive industry, with billions of information transactions occurring on a daily basis in the Australian system. The ability to securely and efficiently store and exchange appropriate information, whether it is fixed text, store and forward or dynamic messaging, visual imagery, or voice, is highly dependent upon the capacity of the underlying communications infrastructure.

The purpose of the eHealth Implementation Group is to progress the implementation of the Health*Connect* strategy, which is an overarching national change management strategy to improve safety and quality in health care by establishing and maintaining a range of standardized electronic health information products and services for health care providers and consumers. The strategy has a strong focus on quality improvement through information management, with all jurisdictions, having recently signed to the strategy. In August 2004 all jurisdictions also agreed on the establishment of the National eHealth Transition Authority (NeHTA) to fast-track the specifications and standards for electronic health in Australia, and the Council of Australian Governments (COAG) agreed that the shared electronic health record was a national priority for reforming the Australian health system.

The Broadband for Health Section is responsible for bringing about the delivery of a secure national broadband network in order to enable the functional implementation of Health*Connect*. Through providing incentives for general practices, Aboriginal community controlled health services, and community pharmacies to connect to business-grade broadband, whilst driving broader health sector connectivity through the Managed Health Network Grants, the section is at the forefront of influencing the take-up of eHealth by providers. The section's work is closely aligned with the National Broadband Strategy, therefore much of the input provided below is derived from the work of this section, and broader eHealth implementation within the health portfolio.

RESPONSES TO QUESTIONS – BROADBAND CONNECT

1 How can the design and delivery of Broadband Connect be optimised to achieve long term sustainable quality broadband solutions for regional, rural and remote Australians?

Given that Broadband Connect has a focus on regional, rural and remote areas, it is essential in the current demand-driven market that the design and delivery of Broadband Connect maximizes opportunities for sustainability in these areas. Broadband Connect must focus on technology which is extensible and scaleable, provide options for a full range of uses (including IPTV, IP telephony), and be affordable for regional, rural, and remote Australians once Australian Government subsidies cease.

Broadband Connect funding should be specifically tailored to focus on sustainability. Now that we have reached the tipping point in terms of demand for broadband by Australian residences and businesses, this investment should focus on one-off opportunities to transform core national communications infrastructure, therefore any interim use incentives should be strongly tied to achieving a sustainable outcome.

2. What means can/should be used to encourage further capital investment in infrastructure that will support competitive networks and services under Broadband Connect and beyond?

Directly tying Broadband Connect incentives to sustainability, for example:

- Having a ratio investment of Broadband Connect funding for regional, rural, and remote. Consider, for example, what percentage of the organisation's current business is in regional, rural, and remote areas, and how do they intend to increase that target in the next ten years?
- Further capping the market share available to a single telecommunications provider, to 35 per cent instead of 60 per cent, thereby allowing possible competition of three key players in regional, rural, and remote areas.
- Reduced support for satellite services would improve capital investment in other technologies.

3. How can Broadband Connect funding be structured to provide the best incentives for investment?

The current method of subsidizing qualified providers for each connection to eligible consumers with a one-off $3000 payment seems out of sync with market developments, especially given the speed, bandwidth, and quality of service packages on offer. The Broadband for Health Program caps incentives based on rurality and remoteness (with a differentiation between wireless/terrestrial and satellite technologies), for business-grade services.

Services qualified under the program range from the minimum business-grade (specifications discussed below) to high quality managed multi-service networks. The price range is therefore as follows:

RRMA Zone	Terrestrial/Wireless	Satellite
RRMA 1	$2,065	$6,324
RRMA 2	$2,168	$6,640
RRMA 3	$2,276	$6,972
RRMA 4	$2,390	$7,321
RRMA 5	$2,510	$7,687
RRMA 6	$2,636	$8,071
RRMA 7	$2,678	$8,475

The incentive is reassessed every quarter based on newly qualified services.

Broadband for Health has a focus on quality and security, not sustainability. Under prior arrangements (pre 1 July 2005), the Broadband for Health incentive was based on the cheapest qualified service in each postcode on the date of contract signature. This had a significant effect in bringing down the price of business-grade services available under the program, however it also meant that health providers were choosing the cheapest (fully subsidized) services and receiving a poorer customer service in return. The number of complaints received by the Broadband for Health program regarding these services resulted in disqualification and suspension of some services. To enable health providers to move to more advanced services, the capped RRMA incentive was therefore introduced. The pre-July 2005 incentive may be very appropriate as an incentive structure for Broadband Connect.

Funding would be better utilised if aligned with other activities. It has been stated that the funding allocated to Broadband Connect will not be used for the same objectives as the Clever Networks program. Considering the most practical steps to achieving scalability and sustainability would be to invest in technologies which are capable of advanced networking. The funding allocated to the Clever Networks program will support only a small percentage of the potential areas which would benefit from this type of development if some tie between the Broadband Connect and Clever Networks programs is not introduced into contractual arrangements.

4. Is terrestrial or satellite the most appropriate means of delivering broadband in regional, rural and remote areas?

Satellite technology has and will continue to provide broadband connection to remote areas which would otherwise be out of reach. There are a number of issues to consider regarding the limitations of Satellite services. Assurance of Quality of Service (QoS) from satellite services is difficult to provide and therefore limits realisation of benefits in the way of advanced applications which suffer on connections with high latency such as VoIP or video or even simple but commonly used applications such as instant messenger programs. Initial setup and ongoing costs of satellite services far outweigh those of other technologies. DoHA has undertaken considerable research into the functionality of patient information recall systems via satellite communications. Results have been disappointing with contention ratios

having a major impact on the functionality of sharing data across remote communities In areas where an alternative to satellite technology may be possible such alternatives should be thoroughly investigated and evaluated. It should also be noted that DoHA projects have encountered downtime on fibre optic cable due to subsurface rodent and termite damage.

5. Can satellite be delivered as competitively as terrestrial services?

The long term cost of satellite delivery far outweighs that of terrestrial services. While the cost of establishing terrestrial infrastructure may be high where services are not currently available, the benefits to long term costs and performance make it a more easily sustained model. Wireless technology has advanced in many areas and appears to be a more competitive and a better performing alternative to satellite services particularly in the near future as the increasing commitments to WiFi, WiMax, iBurst and related technologies evolve.

6. Should participating providers be required to commit formally to service the areas they identify in registration applications?

Considering that various providers may receive applications for the same area, to require those providers to deliver services to all that register interest may result in a large number of providers with a relatively small section of the market for that area. This model is unlikely to deliver commercial benefit to providers. While competition is desirable, too much competition may result in a lack of commitment by providers. Registration applications should be collected and kept in a common database. A system could be developed and implemented to provide opportunities for successful or identified and willing providers to deliver services.

7. Should annual renewal of funding agreements specify timeframes for commencement of services in areas of greatest need?

Particularly where a significant need has been identified it would be appropriate for providers to commit to timeframes for the provision of services. It is important that needs are met in priority areas and is reasonable to specify timeframes as a condition of funding. Delivery of services within specified timeframes will promote confidence in the program, the providers and the technology.

8. Should a system of prioritised funding for services connected in areas of greatest need (beyond what has been provided under the HiBIS two-tiered incentive structure) be introduced?

While previous funding systems have facilitated major improvements in regional and remote areas, these systems could be refined further to ensure areas of greatest need receive the required assistance.

9. What can be done further to overcome barriers to capital investment in sustainable technologies in less commercially viable regional areas?

Industries which have the greatest need for infrastructure in these areas need to cooperate in order to achieve the most benefit from infrastructure. For example it may be possible for health services in the area to receive funding for required infrastructure but this may not be sufficient to establish the core infrastructure required to make the network operational. Education, Law enforcement, Defence, Centerlink, Tax, and Local private industry are examples of other groups. Aggregating residential and business demand across all towns with populations below a certain figure (say 5000) may provide a business case for commercial intervention.

10. How can the high cost of some technologies be reconciled with increasing customer expectations for higher speeds and usage allowances especially in more remote areas?

As an example satellite is a technology of high cost. Provision of higher speed and increased data allowance may not be easily achieved at competitive rates. The customer expectations on speed and download allowance are reasonable when compared with services offered in metropolitan areas or indeed in other countries. Consideration to demonstrated need for higher service specifications on satellite services could be made on a case by case basis. The higher bandwidth and data allowance would be more affordable and sustainable through the use of terrestrial or wireless technologies. One option may be to offer a start-up incentive only to those services who offer "unlimited" plans.

11. Should it be mandatory for program participants under Broadband Connect to provide additional information as listed below as a condition of registration?

- **intended future service areas (with approximate dates of commencement of supply;**
- **the viable geographic reach of broadband services from central transmission points for service delivery;**
- **technical barriers limiting the application of providers' technology in regional communities;**
- **the capacity of providers' technology to support varying types of broadband traffic and use;**
- **the range of service speeds providers' technology would be able to support;**
- **the capacity of providers' technology to provide services now and to accommodate new developments such as increased speed , usage and applications in the future;**
- **the particular relevance of the technology to other communication services (for example, capacity to be used also for supporting mobile telephony services);**
- **a summary of the broad nature of technology they employ; and**
- **anticipated timing and target areas for their technology deployment in regional Australia**

The points listed above detail valuable information which will assist various programs to achieve quality outcomes. If practical it would be useful for this or similar provision of information to be mandatory for all telecommunications providers, and that this information be publicly available.

12. On what basis would you argue that certain specific technologies will have the most impact on the delivery of regional broadband services in the next three to five years?

Fibre infrastructure can provide high performance connectivity to areas which have existing cable laid. Where cable exists within a reasonable range of consumers, it would be practical for investment to be made in providing the last mile link by some means. Although the initial costs may be high, ongoing performance benefits and running costs should ensure sustainability and scalability.
Wireless technology has potential to be the dominant technology in rural and remote Australia. Various wireless protocols have been developed or are under development which will make major advances to bandwidth and range capabilities. Wireless LANs will be capable of speeds of 108Mbps rising as high as 320Mbps.
There are many possibilities for future wireless protocols and it is likely that a number of these will become the preferred choices of technology depending on the required functionality. There is potential for unused, unlicensed UHF TV spectrum to be used for broadband internet services. Waves at lower frequencies are longer in length. Longer wave lengths hold their energy over longer distances. They can travel miles from a tower and find their way inside living rooms. The longer wave lengths are just as ideal for wireless broadband as they are for television broadcasting, particularly since they can also carry large amounts of information.
The gradual increase in RF emission levels will need to be monitored to ensure they remain within the safe emission level thresholds set by the world health organisation.

13. How would you compare the effectiveness of these technologies to others in the market place?

Both fibre and wireless are highly effective technologies, The various DSL options provide quality services but range is limited and signal degradation over distance due to the copper infrastructure. While Wireless technologies may not currently provide consistent connection speeds at high bandwidth, the flexibility and the potential reach of these services place it well as a preferred option. The cost of fibre infrastructure is perceived to be the highest however this is balanced by the best speeds, latency and lack of signal degradation.

14. To what extent will broadband technologies be able to augment capacity to meet rapidly expanding consumer expectations for higher bandwidth and more advanced applications?

Technology has advanced in recent times and will continue to do so. The primary challenge will be in making the best decisions when investing in Technologies and Infrastructure so that advances can be made with the minimum need for changes to

core infrastructure. The current HiBIS specifications need to be raised under Broadband Connect to meet burgeoning demand.

15. Can complementary technologies provide better solutions for delivery of services in regional Australia?

Refer to question 12.

16. What innovative approaches should Broadband Connect adopt in its program design to utilise these technologies most efficiently and effectively?

Possible approaches could include researching emerging and developing technologies. Providing higher incentives to technologies which will provide long term cost and performance benefits. Reduce support for technologies with high costs and reduced performance capability.

17. What capacity do existing technologies have to accommodate the introduction of new developments, such as increased speeds, usage and other applications?

Satellite technology is primarily limited by latency and cost. ADSL2+ enables DSL technology to provide high speeds. DSL range is limited and range can be improved by signal boosters although the widespread use of signal boosters is unlikely to occur. Fibre connections are capable of accommodating requirements in their current state. Trials are currently underway for fibre services to operate at speeds equivalent to ADSL2+. The capabilities of wireless technologies are currently more than acceptable for basic requirements. Future developments in wireless protocols and infrastructure are likely to meet virtually any speed and performance requirements for applications such as video conferencing and IP telephony some time into the future. The extent that the existing infrastructure can be utilised to deliver wireless broadband services is unknown but may involve core networks such as those used by Television and Mobile Telecommunications.

18. Should the current system of incentive payments to providers for the supply of broadband services be retained?

A review of the incentive payment system would be recommended. This should include consideration of technology types, benefits and associated costs.

19. Would an up front method of payment be more effective?

Up front payment may be more effective in assisting providers to develop network infrastructure for long term sustainability. It would be necessary to ensure this and other potential issues are addressed as part of the funding agreement.

20. How else could the method of payments to providers be adjusted to achieve more satisfactory outcomes for providers and people living in regional, rural and remote Australia?

Refer to question 3.

21. Should funding be provided:
- based on the number of customers connected?
- the number potential premises with potential access?
- a combination of both methods?

The way funding could be provided may be done various ways. If only one provider develops infrastructure for the provision of services on a specific area then using the number of potential consumers may be appropriate. If funding were provided on a potential consumer basis it would be necessary for the owner of the infrastructure to allow other providers to use it at an agreed and perhaps regulated wholesale cost.

22. If funding was based on the number of premises with potential access should it then only be provided for infrastructure?

The provision of funding for infrastructure would assist in the development of sustainable technologies and if funding agreements were structured in a proper manner this would enable the Broadband Connect program to provide greater long term value to the community while also aligning it more closely with Clever Networks and other related programs. Considerations to the specification of the funding agreement under this model should include the reasonable alignment of consumer service costs with costs in metropolitan areas.

23. How can methods of payment under Broadband Connect be better structured to ensure that providers are not overcompensated for the supply of broadband services?

Refer to questions 3, 21 and 22.

24. Should the current HiBIS threshold model for speed and usage be maintained at existing levels under Broadband Connect?

The existing minimum specifications do not represent reasonable or acceptable levels of performance or usage. The current specifications are several years behind acceptable levels.

25. Should the model be retained with increased minimum speed and/or usage requirements?

While the model is functional, service speeds of at least 512Kbps download and 256Kbps upload should be set as a minimum requirement. Download allowances should be increased to a minimum of 3GB with options for 10GB and above.

26. Should two separate minimum speeds with two subsidy levels be introduced?

In addition to an increase in the base level of requirements, another level set at higher specifications could be set but may be better suited to Broadband Connect Stage 2 and/or the Clever Networks program. It may be justified to offer funding under exceptional circumstances for performance levels at current HiBIS specifications. In such cases it may be appropriate that the subsidy is of comparably lower level. Conditions of such exceptional circumstances should include analysis of development needs of the associated region and targeting the area for development of required infrastructure long term. DoHA would be willing to discuss this at further length and would be willing to raise the bar of the existing Broadband for Health program in partnership with DCITA for this purpose.

27. Do threshold requirements need to be expanded to accommodate other issues such as latency?

The inclusion of minimum latency requirements would enable the use of applications which suffer or do not function on connections which have higher latency. High profile examples of such applications include IP telephony and video conferencing. In addition the measurement of latency as part of the testing of services will track issues such as those currently experienced with satellite connections.

28. Should the Broadband Connect Stage 1 price caps be retained under Stage 2?

Discussions surrounding methods of payment (questions 18-21) should be resolved to ascertain whether the proposed price caps are appropriate or applicable. In the event the price caps are implemented in Stage 1 they should be reviewed prior to commencement of Stage 2 allow any appropriate adjustments to be made.

29. Should a greater range of price caps be introduced than the two currently available?

The price caps currently available under HiBIS cover two levels of Standard and High Cost. These relate to the availability or lack of access to ISDN. The specifications relating to ISDN are out of date and should not be continued.
This discussion paper mentions three levels of price capping. These are for ADSL, non-ADSL, and two-way satellite. While 3 levels of price cap may be appropriate, the levels the caps are set at for the various technologies should be considered. The distribution of funding between support of new infrastructure development and

incentives for connection to available technology such as satellite should be balanced with long term sustainability and saleability in mind.

30. Should the current funding cap level of 60 per cent continue under Broadband Connect?

The current structure for capping annual program funds available to any single provider should continue. This will allow competition at some level. If any one provider should reach the level set, the identification of alternate providers able to commit to continue offering services would be necessary to identify. The higher the level is set for the funding cap the more important it is that the dominant provider/s allow cost effective wholesale access to the use of its infrastructure by other providers. A funding level cap of 35% would be ideal, however DoHA would default to DCITA cost and market analysis for the appropriate level.

RESPONSES TO QUESTIONS – CLEVER NETWORKS

What form of broker network will provide the best outcome?

1. Considering the current DAB program structure - involving State, community and sectoral brokers - is the current arrangement the best model for catalysing broadband developments in regional, rural and remote Australia or how should it evolve?

1. In principal, the current DAB structure is sufficient to achieve its objectives. A focus on ensuring activities are thorough and brokers effectively communicate issues, proposals and other findings across the DAB network at all levels would improve the program.
2. An issue has been raised by brokers in the past regarding lack of state government support for their work and the resultant complications of HiBIS and State/Territory broadband infrastructure projects undermining DAB work.
3. The role of the DAB needs to be strengthened and the skill-set at State/Territory level needs to include strong negotiation skills and vision.
4. The Broadband for Health program has a State Based Implementation Officer (SBIO) in each jurisdiction. We strongly recommend that DABs work closely with SBIOs and Health*Connect* project directors in each state when aggregating demand in health.

2. What role can/should brokers play in promoting or facilitating the effective use of broadband applications in order to enable communities and businesses to capture the transformational benefits of broadband?

Brokers can promote the use of broadband by communicating existing future and potential applications to consumers. Examples specific to the Health sector include online bookings, referrals, test results, Medicare claiming, specialist consultation over video conference for remote areas without specialist care, electronic prescribing, patient information systems, aged care plans, etc…..

3. What other resources or programs should the brokers be aware of in this role?

Programs such as:

- Broadband for Health
- The Managed Health Networks – Seeding, Development and Application Service Provider Grants
- Health*Connect* activities at regional, State and National levels
- The development of NeHTA standards and
- AGIMO initiatives working towards Government Interoperability on a national scale.

4. Should the broker role include an increased focus on 'effective use' outcomes and, if so, how can this best be achieved?

This will vary geographically subject to last mile issues. Managed networks and application services provide appeal to small to large businesses and are made possible and more efficient through broadband. Such successful activities should be showcased. It is important that the results of various activities and funding be captured and communicated for both reasons of realising benefits and those of lessons learned.
Other DABs may use results to tailor activities in their areas for successful outcomes.

5. Should uptake and effective use of broadband by specific groups be targeted and, if so, which ones?

The uptake and effective use of broadband services should target its focus at core infrastructure and Industry. The Health Industry is a good example to use with the need to provide links between consumers, Hospitals, GPs, Specialists, Pharmacies and other health care providers. The potential benefits of eHealth rely largely on connectivity and interoperability across public, private and non-profit organisations. For example general practitioners need to have channels of electronic communication with specialists, hospitals and pharmacies. Examples where state infrastructure exists for use by hospitals but cannot be used by GPs and Specialists in rural and remote communities is common. This is due to the industry needs not being aggregated vis-à-vis the state government needs. DoHA strongly recommends that the NBSIG identifies a workable strategy to overcome these scenarios.

6. How might the brokers play a role in facilitating/supporting community-wide connectivity and community-wide (cross-sectoral) networks?

The support of community wide connectivity and networks can be aided by the promotion of standards for interoperability and security, and high levels of awareness of activities such as those currently under development by AGIMO. Brokers should ensure that the relevant information reaches the appropriate contacts in each sector. This may include technical specialists and/or communications providers where such issues are outsourced.

7. Should future demand aggregation activities be focussed in areas that have yet to receive terrestrial broadband services under HiBIS to support the delivery of the new Broadband Connect program?

Areas which have not received broadband services under HiBIS should first be assessed to ascertain the extent of interest, need and potential benefits. It may be that areas which have already received services under HiBIS would benefit substantially more from activities which achieve effective use or more sustainable architecture/infrastructure.

Targeted services for Clever Networks initiatives

8. Are health, education, emergency services and local government the appropriate services for Clever Networks to target?

All of the above services are of great value to the community. There is significant potential for benefits to be realized in all areas individually and as a whole between services where applicable. The potential cost benefits alone justify the focus on development in these core services. As discussed within the introduction provided by DoHA, eHealth and improvements in patient safety and quality of care are dependant upon a reliable, affordable and extensible communications network. Whilst the Broadband for Health program is targeting demand in the small business area of the health sector, sustainable solutions will be required through clever networks.

9. Should there be priorities within this group?

The advance and benefits of eHealth activities will affect and be available to the entire population. While Health is a very important core service, it should be possible to target all services in this group with consistent messages to promote interoperability. Given that DoHA has provided incentives to GPs, ACCHs and Pharmacies, incentives to specialists, aged care and allied health would be of further benefit. DoHA would be willing to work with DCITA, and potentially fund hold to ensure these sectors are effectively targeted. Any actual networks supported under Clever Networks should be aligned to Health*Connect* implementation and NeHTA standards.

10. What other sectors, if any, should also be considered?

Local industry may also have a substantial part to play in some regions. For example the mining industry in WA would be likely to take interest in and potentially contribute to any advances in networks which may serve their business and/or its employees.

11. Should there be a focus on particular applications/sectors which will require and drive network or industry capabilities?

The ability to facilitate secure VPN networks and enable those networks to interconnect with other secure networks will be an important area for the future of electronic communications in many industries and services, especially in health. Levels of authentication and registration for network units and/or individuals should also be considered.

12. What strategies could be incorporated into the program design to ensure that investment under Clever Networks provides the greatest holistic community benefit?

As mentioned throughout this response, a focus on supporting new technology which can provide long-term sustainability and scalability is a key priority. Another important objective is promoting the realisation of the benefits of connectivity by investing in networks and applications which display value to the community as a whole and/or to individuals.

Infrastructure and application-focused investment issues

13. Is there an ideal balance between infrastructure and applications streams and, if so, how can it be identified?

It is recognised that connectivity is a key enabler to the realization of the benefits of broadband connectivity. The development of application services which provide value to the community and which utilize connectivity in lead sites serve to act as a snapshot of the way forward. This is the opportunity to 'go big'. There are many applications available to the health sector which are not utilised as high bandwidth connections are not common. This program has to be treated as a unique opportunity to perform significant telecommunications upgrades in Australia.

14. What is the best balance between competitively determined and strategic investment funding?

Competitively determined funding will be responsible for the provision of infrastructure to a large number of consumers. While this is of obvious value it is important that strategic funding be focused at areas which do not have as much commercial interest and the future proof standards of the technology implemented as part of the competitively determined funding. There are areas in Australia known to be communications 'black holes'. Strategic investment should fix these.

15. Would potential proposals be improved if the guidelines permit proposals which encompass both infrastructure and applications aspects?

The inclusion of application services as part of infrastructure proposals may encourage more interest from various industries. This is likely to improve proposals in some areas but should be limited so as not to detract from the key issue of infrastructure.

16. What key strategic investments in broadband infrastructure have the potential to provide the best outcomes?

Investments in wireless technology would be perceived as a sound investment. As mentioned throughout this response, wireless networks have potential for providing quality services to the majority of the nation. Development of secure connectivity and functionality for the interoperability of secure networks would be another valuable investment. The need for security requirements and assurance is already apparent and as connectivity and functionality grows it will become a widespread concern and priority.

Funding for Clever Networks initiatives

17. Are there complementary sources of funding/contributions which should be considered in developing the guidelines for the Clever Networks program?

As mentioned in the introduction to this response, the Broadband for Health program and recently announced Managed Health Network Grants are closely aligned with the Clever Networks program and DoHA is committed to working with Clever Networks to achieve the objectives of both programs. Principles of the Managed Health Network Grants include the following:

- Capability of the organisation/s to manage the project;
- Financial viability of the network service manager;
- Change management strategies to be harnessed;
- Relationship to demand aggregation and other factors influencing sustainability, especially private sector investment;
- Relationship to and alignment with Broadband Connect and Clever Networks programs;
- Compliance with DoHA and NeHTA advised security standards (where appropriate);
- Relationship to state/territory government broadband initiatives; and
- How the network will support the implementation of other e-health activities, such as Health*Connect*.

Other programs which may provide helpful information are state level Health*Connect* implementation projects.

Utilising new and emerging technologies

18. Should there be specified minimum broadband specifications (eg. bandwidth, latency etc) for Clever Networks and, if so, what should they be and how should they be determined?

The minimum specifications for broadband services for Clever Networks should be service speeds of at least 512kbps download and 256kbps upload together with download allowances should be increased to a minimum of 3GB with options for 10GB and above. Specifications above and beyond these levels are recommended to assure 'clever' or 'next generation' network status. Specified requirements for latency of connections will provide a level of assurance for the use of advanced applications which are affected by latency issues. The benchmark for broadband download speeds in the near future will be at 10,000kbps and above.

19. What steps / mechanisms can or should be incorporated, if any, into Clever Networks to enable regional, rural and remote communities progressively to transition to high / higher bandwidth networks?

As previously stated, the importance of investment in scalable and sustainable technologies throughout both the Broadband Connect and the Clever Networks programs should be recognised as one of the most important aspects of both programs. This will ensure not only the ability to increase network speeds but also will minimise the duplication of infrastructure development costs.

20. New technologies are showing considerable promise in providing broadband access to users well outside the current DSL limitations. What strategies should be adopted to encourage and support deployment of these new technologies, and to ensure newly emerged technologies are not precluded during the lifecycle of the program?

Wireless technology has potential to be the dominant technology in rural and remote Australia. Various wireless protocols have been developed or are under development which will make major advances to bandwidth and range capabilities. Wireless LANs will be capable of speeds of 108Mbps rising as high as 320Mbps. There are many possibilities for future wireless protocols and it is likely that a number of these will become the preferred choices of technology depending on where requirements
There is potential for unused, unlicensed UHF TV spectrum to be used for broadband internet services. Waves at lower frequencies are longer in length. Longer wave lengths hold their energy over longer distances. They can travel miles from a tower and find their way inside living rooms. The longer wave lengths are just as ideal for wireless broadband as they are for television broadcasting, particularly since they can also carry large amounts of information. It would be highly recommended that DCITA engage specialist technical resources to present a summary of the direction of wireless technology and provide recommendation on the most appropriate areas for investment and development.
Another technology to consider and seek further advice on is optic fibre. This infrastructure can provide high performance connectivity to areas within practical

reach of existing cable. Broadband over power lines may develop further in the future however results of trials to date seem to indicate limitations which make the technology impractical in most scenarios.

Sustainability of Clever Networks initiatives

21. What supporting information should be required in Clever Networks proposals in order for their sustainability beyond the life of the program to be evaluated effectively, and what factors should be considered in determining sustainability?

In order for sustainability to be identified in Clever Networks proposals it would be necessary to specify questions around the capacity of core networks and backhaul links. Also the applicants projected bandwidth and data usage requirements into the future and how it is proposed that these be achieved.

New infrastructure access arrangements

22. For any new infrastructure created or made available, should there be specified minimum infrastructure access arrangements for parties other than infrastructure owners, such as a wholesale-rate for backhaul?

Access arrangements for other parties to allow use of core infrastructure must be developed. Consideration should be given to the regulation of charges for the use of core infrastructure to ensure reasonable competition to take place.

23. How realistic is such a requirement, and how tangible are the likely benefits of the approach?

If the requirements are developed with consultation of industry and careful consideration for all potential issues, it is likely that the benefits will be rewarding to the objectives of the Clever Networks program.

24. How can an appropriate charging regime for such access be determined?

To best determine the appropriate charging regime it is recommended that this be addressed by industry stakeholders.