



## Desert Knowledge CRC comments on Backing Indigenous Ability Discussion Paper

### DK-CRCs goals and outcomes

Desert Knowledge CRC is committed to creating economic opportunities for desert people, and to making a demonstrable difference for remote Indigenous communities, through the application of excellent research and training.

Through its network and expertise of 28 partners (see more at [www.desertknowledge.com/crc](http://www.desertknowledge.com/crc)), it will achieve this goal by delivering to three broad outcomes under which six core projects are structured:

#### **Outcome 1: Sustainable livelihoods for desert people**

Core Project 1: Benefiting Australia through livelihoods from desert resources.  
Core Project 2: Key industry opportunities in remote areas.  
Core Project 3: Supporting the emergence of small business in desert Australia.

#### **Outcome 2: Viable remote desert settlements, particularly remote Indigenous communities**

Core Project 4: What makes desert settlements viable?  
Core Project 5: Demand-responsive access to services for settlements.

#### **Outcome 3: Thriving desert regional economies**

Core Project 6: Desert regions as integrated systems.

### DK-CRC telecommunications research

Telecommunications is a significant aspect affecting the future in a number of areas of relevance to our objectives. For example, telecommunications has a role in the success of established small businesses (our Core Project 3), opportunities for new businesses (Core Project 3), delivery of many essential services (Core Project 5), maintenance of infrastructure (Core Projects 4 and 5), and basic communications. From this perspective, the DK-CRC has invested in research to address the inadequacies of current telecommunications in Desert Australia. Rather than criticise the BIA Discussion paper for inadequacies, we have focussed our responses on what could be possible as a result of the research and development we are undertaking. This submission is intended to highlight *what is possible in the near future, rather than what is possible today*.

We are working new and emerging networking technologies such as ad hoc mesh networks and TV messaging. Using current WiFi and WiMax wireless radio standards, we are designing networks that can extend the reach of existing telecommunications infrastructure within and between remote settlements (Aboriginal and pastoral). The networks can provide a cost effective and easy way to access voice and Internet services. Ad hoc networks can be deployed in an unplanned manner and are resilient to failures. The networks can determine and establish multi-hop communication paths, which can be easily extended by adding nodes. Part of the project scope is to design the ad hoc nodes so that people without specialist

telecommunications skills can deploy, extend and maintain ad hoc extensions to the fixed telecommunications infrastructure.

The key features of the systems are as follows:

- (i) low cost residential telephone network within a remote settlement from Voice-over-Internet technology without the need for expensive network cabling and maintenance;
- (ii) telephone connectivity beyond the settlements limits when linked into satellite, microwave or cable/fibre infrastructure;
- (iii) broadband data transmission is an in-built feature of the systems allowing connectivity for residents of remote communities. This also meets the goals of the Broadband Connect and Clever Networks component of Connect Australia;
- (iv) ability to link VoIP-enabled mobile phones into the ad hoc networks means that as the networks proliferate, a convenience and safety mantle is extended across inland Australia. This also meets the goals of the Mobile Connect component of Connect Australia.

The TV messaging system uses the effectiveness of television a medium for delivery of messages to a community that controlled-by and potentially created by the local community. Messages can be in local language and relate to a range of appropriate cultural events and circumstances.

We appreciate there are a number of unresolved questions apart from the technical issues with the research and development, about how such new technologies will roll out. These include thoughts such as: engagement of Aboriginal people for on-ground trials (although we have good networks for doing this); relationship to the Standard Telephone Service within the USO under the Telecommunications Act; and maintenance requirements and skill levels in remote areas. A number of partner organisations within the DK-CRC and closely-related to it's research commercially (eg Coutts Communication, Centre for Appropriate Technology) will be providing their own submissions, and may address some of these issues

Rather than respond to specific questions posed in the BIA document we have arranged responses around three key themes.

## Phone services in settlements

One premise underlying the strategy appears to be that a phone in each household (as is the standard in the remainder of Australia) is not possible. This may be based on the assumption that it is too expensive to install and maintain phones in each household. The DK-CRC does not believe this premise is a sufficient starting point and is working on telecommunications systems that change the underlying assumption to deliver a better service. If successful in getting this new telecommunications technology into use, the cost of installation and connection of household phones can be dramatically reduced. At the same time, our telecommunications research on wireless 'mesh' networking rather than cabled networking, has solutions in a number of other areas as outlined above.

Of course this system is in an R&D stage and not yet ready for off-the-shelf purchase and roll-out. We have working prototypes of the system and are about to embark on extensive field testing to assess load characteristics and reliability. Within only a few months, we will be able to assess the pathway to wide-spread application and aim to have commercial partners on board.

## Internet access and data transmission

Internet access is an important initiative in BIA and upgrading hardware is important. But once again we see that limiting it to a single shared facility in a community is not very forward looking. Increasingly, transactions of all sorts are done by internet and the ability for people living in remote parts of Australia to connect to larger centres by information technology is critical for the future. Simultaneously, data transfer can greatly enhance emergency responses and management of remote infrastructure. Greater data transmission bandwidth can allow more advanced telemedicine directly from the point of need to expert advice. Better management of traffic on limited satellite/cable systems and extension of the broadband

network can greatly enhance the ability to provide emergency services. Similarly, data logging equipment that reports faults in key equipment (eg solar systems, water pumps, electricity generation) to a central location, can reduce costs and provide more reliable services because service technicians can arrive at the right time and armed with the correct parts to effect a repair.

Accordingly we have designed high capacity data transmission into the wireless mesh network technology to allow internet traffic and other sorts of data transfer (eg operational performance of infrastructure). These mesh networks still require connection to the networks in Australia and overseas and this can be done through existing cabling/fibre or satellite link. Hence, an emphasis on connection hardware with the capacity to carry higher volumes of information would be important.

## Mobile telecommunications

Patterns of phone use in Desert Australia coming from recent information that the DK-CRC has collected, and also from discussions we have had with telecommunications providers, indicates that Aboriginal people are taking up mobile technology at a dramatic rate. The high mobility of people among settlements in a region, and the patterns of visits to major service centres (e.g., Ceduna, Alice Springs, Kalgoorlie) means that mobile phones are a convenient way to stay in touch, especially through message services. The BIA strategy does not appear to take account of these patterns, nor the necessity of providing infrastructure for this as a growing trend with Aboriginal and non-Aboriginal people.

Telecommunications that respond to the need of residents and travellers, and are prepared for larger-scale trends in the future would have the following characteristics: systems that are based on Voice-over-internet; systems that allow mobile phones and fixed handsets to link seamlessly; and mobile systems that use multiple modes of communication (e.g., use terrestrial networks when available and satellite systems when they have to). The systems we are designing have some of these capacities (eg mobile phones linking to new or expanded terrestrial networks created in and around settlements of all sorts) and so offer more service and safety than traditional models.

## Summary

We have outlined the ways in which the DK-CRCs research may provide new telecommunications solutions for residents and visitors to desert Australia. Our program could deliver new capacity in telecommunications in remote areas that resonates with the goals of many aspects of the Connect Australia strategy. We welcome the opportunity to keep DCIAT informed of developments in the area outlined above, and hope that DCITA will partner with us to evaluate and roll-out tested systems in the near future.

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