# Appendix

## Appendix 1: Transition to the National Broadband Network (NBN) Interim Satellite Service (ISS)

Take-up of ISS services for the majority of householders was consistent with their intentions in September 2013. In total, ten households (compared with seventeen households or community buildings originally connected in the project) ultimately retained the use of the internet. There has been considerable change in the total composition of households engaged in the project since the original implementation in mid-2011: a number of households were added and/or changed resident members, and most of the shared building computers were re-distributed to individual households along the way. The table below summarizes these changes.

Table 1: Changes of status of buildings and houses

| **Community** | **Building** | **Original status mid-2011** | | | | **Post transition status early 2014** | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | Internet connection? | |  | | Internet connection? | | Original occupants/ users? | |
| **Kwale Kwale** | Community shed | 2 shared computers | yes - both | | 1 shared computer | | no | | Yes | |
|  | Residence 1 | 1 computer | yes | | 1 computer | | no | | Yes | |
|  | Residence 2 | 1 computer | yes | | 1 computer | | no | | Yes | |
|  |  |  |  | | 1 computer | | no | |  | |
| **Mungalawurru** | Community shed | 2 shared computers | yes - both | | Nil | | | | No | |
|  | Residence 1 | nil |  | | 1 computer | | yes | | No | |
|  | Residence 2 Note 1 | 1 computer | yes | | 1 computer | | no Note 1 | | No | |
|  | Residence 3 | 1 computer | yes | | 1 computer | | yes | | Yes | |
|  | Residence 4 | 1 computer | yes | | 1 computer | | no | | No | |
| **Imangara** | Women’s Centre | 2 shared computers | yes - both | | Nil | | | | No | |
|  | Residence 1 | 1 computer | yes | | 1 computer | | yes | | No | |
|  | Residence 2 | 1 computer | yes | | 1 computer | | yes | | Yes | |
|  | Residence 3 | 1 computer | yes | | 1 computer | | yes | | Yes | |
|  | Residence 4 | 1 computer | yes | | 1 computer | | no | | No | |
|  | Residence 5 | 1 computer | yes | | 1 computer | | yes | | No | |
|  | Residence 6 | Nil | | | | 1 computer | | no | | no Note 2 |
|  | Residence 7 | 1 computer | | yes | | 1 computer | | yes | | yes Note 2 |
|  | Residence 8 | 1 computer | | yes | | 1 computer | | no | | No |
|  | Residence 9 | 1 computer | | yes | | 1 computer | | yes | | no Note 2 |
|  | Residence 10 | Nil | | | | 1 computer | | yes | | yes Note 2 |
|  | Residence 11 | Nil | | | | 1 computer Note 3 | | no | | No |
|  | Residence 12 | Nil | | | | 1 computer | | no Note 4 | | Yes |
|  | Residence 13 | 1 computer | | yes | | 1 computer | | yes | | Yes |
|  |  |  | |  | |  | |  | |  |
| **Total** |  | 20 computers | | 20 of 20 | | 21 computers | | 10 of 21 | | 10 of 22 |

Note 1: Computer is now located in Tennant Creek township. Resident obtains internet connection via a smartphone.

Note 2: These houses were demolished and rebuilt during 2013.

Note 3: Computer is not installed in this house at the time of writing.

Note 4: This house had internet connection from January 2013 until end October 2013 i.e. prior to the transition.

## Appendix 2: Location and Movement of the Computers in the Communities

Eleven computers were installed in Imangara from late July to early August 2011; two were located in the Women’s Centre for use by the general community and by the couple running the Centre, while the remainder were installed in individual houses. Later in the project, an additional three computers were installed in individual houses not originally included in the study (Figure 1). Although this community building is called the Women’s Centre, this space is not the exclusive domain of women. Some men regularly visited the Women’s Centre, and at least two men were frequent users of its computers during the project.

Figure 1: Location of households in Imangara that participated in the study in July 2011 with later additions up to the end of September 2013 noted



In Mungalawurru, five computers were installed in June 2011, three in individual houses and two in what was referred to as the ‘CDEP shed’, which was considered to be a public space accessible by all community members (Figure 2). One of these was notionally allocated to a female resident, while the other was understood to be a computer for shared use by those community members who did not receive household computers.

Figure 2: Location of households in Mungalawurru participating in the study in July 2011



Within the first twelve months of the project’s longitudinal phase, 45 per cent of participants at Imangara and 80 per cent of participants at Mungalawurru had signed formal ownership agreements. Additional formal take-up occurred between September 2012 and September 2013: one participant at Mugalawurru, and two residents at Imangara – one of whom was not initially involved in the HIP study – signed formal ownership agreements. By the end of September 2013, 69 per cent of computers at Imangara and 100 per cent of those at Mungalawurru were subject to formal ownership agreements.

Despite equipment failure, loss or damage, an average of seventeen of the twenty computers installed by early August 2011 were operational during the nine months through to the end of April 2014. (Two computers failed but could be repaired, another was taken out of the community and returned with components missing, and the only laptop was irreparably damaged by a small child.)

Table 2: Failures or losses of core equipment August 2011 to September 2013 inclusive

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Item** | **Total installed population** | **Qty lost/**  **removed by resident**  **(A)** | **Qty failed or damaged beyond repair (B)** | **Qty non-**  **functioning and repaired (C)** | **Mean time between failures (months)**  **(B & C)** |
| Computer | 22 | 2 | 8 | 14 | 26 |
| Monitor | 21 | 2 | 7 | 1 | 68 |
| Computer  /Monitor | 22 | 2 | 15 | 15 | 19 |
| Printer | 18 | 2 | 22 | 19 | 11 |
| UPS | 20 |  | 8 |  | 65 |
| Network | 19 | 2 | 2 | 9 | 45 |

By comparison with this total of twenty-two computer failures over the twenty-five-month project period, a large survey of failure rates in corporate desktop computers referenced at <http://www.partnerinfo.lenovo.com/partners/us/products/downloads/thinkcentre-mseries/TBR-Quality-Study-ExecSummary.pdf> recorded an average 15.29 per cent failure rate, requiring warranty repair over the first two years of service, or 3.5 failures for an equivalent population of twenty-two computers over twenty-five months.

Table 3: Number of inter- and intra-community computer relocations and removals from the community according to ownership status at the time of relocation/removal, post-installation phase, August 2014, Imangara and Mungalawurru

| **Incident type and ownership status at time of incident** | | **Imangara** | **Mungalawarru** | **Total** |
| --- | --- | --- | --- | --- |
| Intra-community relocation | Number Shared\* | 2 | 1 | 3 |
|  | Number Nominally owned | 2 | 3 | 5 |
|  | Number Western Legal Ownership | 0 | 1 | 1 |
| Removals to Alice Springs by researchers owing to technical failures | Number Shared | 0 | 1 | 1 |
|  | Number Nominally owned | 6 | 1 | 7 |
|  | Number Western Legal Ownership | 3 | 3 | 6 |
| Removals to locations outside of the community by participants | Number Shared | 0 | 0 | 0 |
|  | Number Nominally owned | 2 | 0 | 2 |
|  | Number Western Legal Ownership | 1 | 1 | 2 |

Figure 3: Inter and intra-comunity computer movements by residents and type of ownership at the time movement occurred, between July 2011 and August 2014, Imangara



## Appendix 3: Gender and Uses

Figure 4: Gender and technical function. Source: Seemann, Kurt W., Matthew Parnell, Stephen McFallan, and Selwyn Tucker. Housing for Livelihoods: The Lifecycle of Housing and Infrastructure through a Whole-of-System Approach in Remote Aboriginal Settlements. Vol. 29, Alice Springs: Desert Knowledge CRC, 2008 (Reproduced with permission of the author).



Figure 5: Computer uses (number of users), November 2012

Figure 6: Computer uses (minutes per day), November 2012

Figure 7: Who uses the computer most often?

Figure 8: Women's top five ICT activities

Figure 9: Men's top five ICT activities

Figure 10: How participants learned new tasks

Figure 11: Percentage of each task type requested by learners or suggested by researchers

Figure 12: Frequency of the different types of learning tasks illustrated as a percentage of all learning opportunities during fieldtrips

## Appendix 4: ICT Program Models and their Features

Table 4: Three community computing program models and their features

| **Feature** | **‘Home Computing’**  **Model**  **(distributed internet facilities and computer in each household)** | **‘Community Wi Fi’**  **model**  **(centralized internet facilities with users connecting to those using WiFi capable computing devices)** | **‘Community Internet Access Center’ model**  **(centralized internet facilities and computers in a supervised room within a community building)** |
| --- | --- | --- | --- |
| **Typical funding model** | External funder pays for individual internet connections and computing devices; households pay own internet access fees | External funder pays for internet access and WiFi facilities; users supply their own computing devices | External funder pays for all facilities and supervision |
| **Capital costs** | High aggregate cost for individual satellite internet connections and computer hardware at all households | * Medium cost for shared local area network hardware and satellite internet connection at community level * High costs to users for computer hardware | * Medium cost for centralized shared satellite internet access and PC hardware in single building * High building cost (either capital cost for new building or ongoing rental cost for existing building) |
| **Operational costs** | * High aggregate internet access charges * High maintenance costs for computing devices (borne by user) | * Medium internet access charges * Low network maintenance costs * High maintenance costs for computing devices (borne by user) | * Medium internet access charges * Low network maintenance costs * Low maintenance costs for computing devices * Very high supervision cost, including supervisor accommodation * Variable building maintenance costs |
| **Overall costs** | High | Medium | High |
| **Focus** | Family centered | Individual user | Individual user or small groups |
| **Suitability for mixed gender use** | Yes, but the model may encourage use along gender lines i.e. that the women are responsible for managing and paying for it | Yes, but care needed with placement | Group(s) of one gender may dominate use, making the other reluctant to use the facility |
| **Suitability for young children** | Yes | No – access to portable devices unlikely | Yes, with parental supervision |
| **Facilitating school learning** | School student friendly with parental support | Limited | Collateral support for schooling with teacher and supervisor collaboration |
| **Suitability for**  **older residents** | Yes | Limited – familiarity with mobile computing devices less likely | Group(s) of younger users may dominate use, making older people reluctant to use the facility. Physical access (walking distance) may also be an issue. |
| **Compatibility with capacity offered by NBN satellite consumer services?** | High | Medium – multiple satellite services may be needed | Medium – multiple satellite services may be needed |
| **Reliability of network services and equipment** | High | High | High |
| **Reliability of computing devices** | Low – exposed to home environment | Low – exposed to outdoor environment | High – assisted by physical environment and supervision |
| **Suitability for high level of resident mobility between households?** | Low | High – supports portable devices | Varies depending on where residents move to |
| **Limitations** | Home environment often not suitable for care of computing hardware (PC, printer) | * Multiple WiFi Access Points required for larger communities * Limited or no coverage within buildings | * Suitable community building may not be available * Only accessible during staffed hours * No option for the resident to own their own computer, so may be seen as ‘second choice’ |