6. Housing and infrastructure

One of the priority issues identified by the people of Thamarrurr under the regional ICCP agreement is housing and construction. Under the agreement, the goal of raising housing standards in the region to acceptable levels is vested in the housing and construction working group which has a firm basis for its activities in the form of the *Thamarrurr Region Business Plan for Community Housing 2002–2006* (TRBP). As a long term operational plan, this has as its goal the achievement of average occupancy rates of seven persons per dwelling, although in the context of environmental health standards and the need for basic functional requirements in meeting housing standards, the actual targets are, of necessity, more complex than this simple formulation. Adjunct to this plan is a spatial planning objective of intra-regional decentralisation enabling family groups to reside more permanently on country.

Housing

Difficulty in establishing a precise measure of housing need arises from the stock and flow nature of housing assets. This is captured in the data shown in Table 6.1 which indicates that the Thamarrurr Regional Housing Authority manages 217 dwellings in the Thamarrurr region (this includes eight houses at the new Manthatpe subdivision and 18 improvised dwellings) to provide for an Aboriginal service population of some 2260. In addition, there are 39 government-owned dwellings occupied by teachers, police, health staff and other government workers.

In terms of a simple occupancy rate calculated as the number of dwellings to service population, the Aboriginal housing stock accommodates 11.0 persons per dwelling. However, as also shown in Table 6.1, 17 of these dwellings require major repair, and 54 need to be demolished (33% of the stock) leaving only 148 habitable homes. If the sub-standard dwellings are excluded from the stock, the occupancy rate rises to 16 persons. At the same time, a few of the structures referred to here as dwellings (especially at outstations), are more appropriately described as shelters and not houses, although precise determination of what constitutes a 'house' for the purposes of calculating occupancy is open to interpretation. This is an issue that will no doubt be addressed by the Thamarrurr Housing and Construction priority working group. Suffice to say, that by most standards, the actual stock of satisfactory housing might well be reduced further below 136, although the current working figure used by the Thamarrurr Regional Housing Authority is 157.

Also problematic is the impact of population mobility. Table 6.1 shows Aboriginal service population estimates for Wadeye and separate outstations. The term, estimates, is used here to reflect the inherent uncertainty of establishing a population figure for a given locality owing to the frequency of mobility between localities, especially between Wadeye and outstations. The figures shown indicate the numbers that were allocated to places from the community survey and in administrative records as at August 2003. However, it should be noted that the Wadeye figure is substantially inflated in the wet season owing to a shift of population from outstations to town. Likewise, the population at some

outstations can rise substantially for short periods (even daily) owing to movements of people out of town as well as from outside of the region. Within Wadeye itself, and particularly within the six main camp areas, substantial inter-household mobility occurs with numbers resident at any given dwelling rising and falling according to circumstance. The data shown in Table 6.1 therefore represent an essentially static view of a highly dynamic situation. From a planning perspective, the best that can be said is that these data point to a minimum service population for the town of Wadeye of around 2050, and a peak service population for outstations of around 200. At times, though, the numbers resident in Wadeye may approximate the regional total of over 2200 due to periodic movements into town. In terms of housing provision, these temporary relocations of people add substantially to pressures on accommodation, not least via increased wear and tear on housing stock and habitability (functionality), mostly by virtue of intense periods of overuse.

Table 6.1. Thamarrurr Regional Council housing stock and Aboriginal service population by location, 2003

			In need of:		
Location	**Population**	**Dwellings**	**Minor repairs**	**Major repairs**	**Replacement[b]**
Wadeye	2045	154[a]	106	15	33
Ditchi	5	2	0	0	2
Nadirri	25	6	1	0	5
Perrederr	20	8	8	0	0
Ngardinitchi	6	3	0	0	3
Wudapuli	30	6	4	0	2
Nemarluk	47	6	5	0	1
Merrepen	19	6	6	0	0
Kultchill	0	0	0	0	0
Kuduntiga	3	3	0	0	3
Kuy	15	5	4	0	1
Ngarinthi	0	1	1	0	0
Nama	11	1	1	0	0
Ngunithak	6	2	2	0	0
Tchindi	0	0	0	0	0
Nangu	0	1	1	0	0
Wumuirdin	0	1	1	0	0
Yederr	0	3	0	1	2
Fossil Head	12	4	4	0	0
Kubiyirr	5	2	0	0	2
Old Mission	9	4	3	1	0
Nama	2	1	1	0	0
Total region	2260	219	148	17	54

a. Includes eight new houses at the Manthatpe subdivision

b. Includes 18 improvised dwellings

Source: Thamarrurr Regional Housing Authority, and Thamarrurr community census

This intra-community mobility, combined with movements into Wadeye from outstations and from elsewhere such as Palumpa, makes it very difficult to assign many individuals to particular dwellings. Having said that, while the average number of persons per functional dwelling in the region amounted to 17, there are several dwellings that cater for more than this number. While the process of assigning individuals to particular dwellings remains a task of the housing and construction working group, at least 48 dwellings had more than the average number of occupants in 2003, with one having as many as 22. However, as noted above, this situation varies over time. According to the Thamarrurr Regional Housing Authority, a 2002 housing occupancy survey of Wadeye recorded six dwellings with more than 20 occupants and one with 26. Because of this fluidity, average occupancy provides the most useful underlying baseline measure.

The major response to such inadequacies was led by the Commonwealth and developed out of the National Aboriginal Health Strategy (NAHS) in 1990. This recognised an essential link between health outcomes and the provision of housing and infrastructure to acceptable minimum standards. Accordingly, funding allocations in the initial years of the NAHS primary health and environmental health programs included amounts directed at housing and infrastructure services within ATSIC's Community Housing and Infrastructure Program (CHIP). However, a review of CHIP in 1994 identified a range of problems, including a failure to address housing and infrastructure needs in a holistic way. Because of the short-term nature of the program-based approach to funding, communities were being required to structure housing needs to the CHIP program rather than the other way around (ATSIC 1994). A key response to these criticisms was the establishment in 1994 of the Health Infrastructure Priority Projects (HIPP) program to pilot new delivery arrangements for the construction of Aboriginal community housing and infrastructure.

A significant outcome from NAHS/HIPP and Indigenous Housing Authority of the Northern Territory (IHANT) spending in Thamarrurr has been the establishment of the Manthatpe subdivision with the construction of eight new houses in 2003 and planning space for a further 16. This housing is earmarked for members of the Yek Maninh and Wentak-Nganayi clans and as such represents a prototype development in the context of Thamarrurr regional planning as the first attempt to locate families on country away from Wadeye town.

While the high occupancy rate reflects larger Aboriginal household size and, in part, a cultural preference for extended family living arrangements, it is fundamentally a measure of the inadequacy of housing stock available to accommodate the regional population. To acquire a better sense of the adequacy of housing, occupancy rates must be set against dwelling size and one measure of this is provided by the ratio of available bedrooms to the population in dwellings (Table 6.2). Overall, in the region, the CHINS recorded a total of 484 bedrooms in 2001. Since that time, construction of new housing at the Manthatpe subdivision has added further bedrooms. However, many rooms within the housing stock remain in substandard dwellings and include improvised bed-

rooms. By excluding these, the current (2003) working figure for the number of available bedrooms in Thamarrurr is 451, which translates into an average of five persons per bedroom.

Future housing needs

Usually, in estimating housing needs, a model of future household formation by size of household would be required on the assumption that individual households occupy individual dwellings. This is not possible in the Thamarrurr region given the highly fluid nature of household composition and its typical distribution across more than one dwelling. Thus, to estimate future housing needs, a simple equation of projected persons per dwelling is employed using the population projections data shown in Table 2.6.

To begin with, there is already a substantial need for additional housing. In the current TRBP it is estimated that an extra 206 dwellings would be required to 'normalise' the situation at seven persons per three-bedroom dwelling. However, with rapid population growth this estimate is not static and will grow in line with resident numbers.

Table 6.2. Dwellings by bedroom size: Wadeye and outstations, 2003

	Population	No. of bedrooms				Total bedrooms	Persons per bedroom
		2	3	4	5		
Wadeye	2101	33	71	22	2	377	5.6
Ditchi	8	2	0	0	0	4	2
Nadirri	6	4	0	0	0	8	0.75
Perrederr	20	7	1	0	0	18	1.1
Ngardinitchi	0	3	0	0	0	6	0
Wudapuli	30	2	2	0	0	10	3
Nemarluk	35	3	2	0	0	12	2.9
Merrepen	25	2	3	0	0	13	1.9
Kuy	15	4	0	0	0	8	1.8
Yederr	0	3	0	0	0	6	0
Fossil Head	12	3	0	0	0	6	2
Kubuyirr	0	2	0	0	0	4	0
Old Mission	6	3	1	0	0	9	0.7
Nama	2	0	1	0	0	3	0.7
Total region	2260	71	81	22	2	484	4.7

Source: Thamarrurr Regional Housing Authority, and Thamarrurr community census

Because the service population is used in estimating housing needs, one difficulty in calculating future needs lies in establishing likely service population numbers as the projections provided in Table 2.6 refer to usual resident numbers only. There are no

clear methods available here, and so the service population is simply assumed to grow in tandem with the usual resident population. On this basis, the Aboriginal service population is estimated to reach 4260 by 2023. Using this figure, and the current occupancy rate of 16 persons per functional dwelling, it can be estimated that an extra 122 dwellings would be required by 2023 simply to maintain the current occupancy at this very high level. In this case, the stock of functional dwellings would need to total 266 (as opposed to 144) within the next 20 years.

However, as set out in the TRBP, the intention is to normalise the situation and achieve a ratio of at least seven persons per dwelling. If this were to be achieved, a total of 465 extra dwellings would be required by 2023, producing a total stock of 609 functional dwellings. The reference here to 'functional' dwellings is important, as this indicates that housing needs include more than just the provision of shelter. They also include aspects of functional utility for healthy living.

Another approach to housing needs assessment has been developed by IHANT which applies a bedroom need index based on the housing needs model developed initially by Jones (1994). In recognition of the multidimensional nature of Indigenous housing need, IHANT also incorporates other dimensions of need and so the formula for assessment becomes an amalgam of the following:

Overcrowding and homelessness:

- number of additional bedrooms needed for the population against a standard of 1.8 per bedroom
- count of the number of temporary or improvised bedrooms to be replaced

Stock condition:

- count of the bedrooms needing to be replaced due to poor condition
- count of the number of bedrooms needing major repair or renovation

On this basis, the number of new bedrooms required in the Thamarrurr region to meet IHANT guidelines in 2003 amounted to 846 with 21 bedrooms requiring replacement leading to an overall estimate of total additional bedroom need of 867. At an average cost of $60 000 per bedroom, this produces a total cost for the normalisation of housing stock of $52 million.

Environmental health infrastructure

As with the measurement of housing need, the status of environmental health infrastructure requires a detailed assessment of functionality and adequacy set against agreed normative criteria. At the time of writing, two data sources were available for the Thamarrurr region to establish this—the CHINS, and IHANT's Environmental Health Survey. Of these sources, the data from the 2001 CHINS are the least useful for compiling a detailed inventory of the condition of environmental health infrastructure as they report only at a community-wide level and in general terms. Thus, while information on key

items such as water supply, sewerage, drainage and solid waste disposal are provided, this is more in the form of simply noting the existence or otherwise of infrastructure rather than assessing its functionality and adequacy in any detail. Likewise, CHINS data do not allow for the proper assessment of activities related to such issues as dust control, animal health and quality of waterways. For example, with regard to dust control, all that is available from the CHINS is the fact that a certain number of permanent dwellings are on sealed roads. Thus, while this provides some indication of the likely extent of dust mitigation as an issue, it is far from adequate as a baseline indicator.

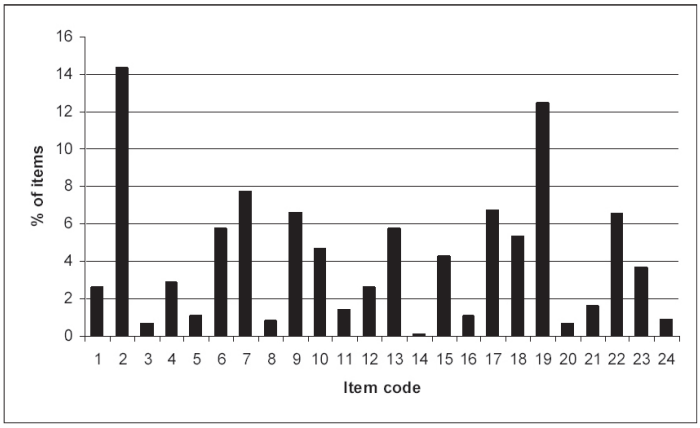
The IHANT survey data provide for a more accurate picture of housing functionality as they are based on physical inspections of each individual dwelling and framed around the notion that Aboriginal community housing and infrastructure should be designed, constructed and maintained to support healthy living practices, principles now firmly embedded in policy following the pioneering work of Pholeros, Rainow and Torzillo (1993) in the Pitjantjatjara Lands. A total of nine such practices are identified, in descending order of priority in terms of impact on health outcomes: capacity to wash people, wash clothes and bedding, remove waste safely, improve nutrition, reduce crowding, separate people from animals, reduce dust, control temperature, and reduce trauma. Each of these refers to different aspects of the functionality of dwellings and their related infrastructure. For example, if the focus is on improving nutritional standards and practices, then 'healthy home hardware' refers to the provision of adequate facilities to store, prepare, and cook food. It also extends to water quality and quantity as a lack of these may lead individuals to purchase bottled water or other beverages, thereby adding to expenditure and increasing reliance on soft drinks and cordials.

Accordingly, the National Indigenous Housing Guide (Commonwealth of Australia 1999) and the IHANT guide to environmental health standards for remote communities in the Northern Territory (Northern Territory Government 2001) include a range of detailed design and functionality standards related to these healthy living practices. The key functional area with most guidelines is that involving the supply, usage and removal of water: six of the nine healthy living practices are dependent on these. However, even seemingly obscure health-related housing functions include a wide range of design, maintenance and infrastructural features that require attention (Commonwealth of Australia 1999: 49–57). For example, guidelines for improved nutrition include consideration of the following factors that provide an indication of the detailed assessments involved in measuring functionality:

- *Different ways of cooking:* Given often-crowded dwellings and failure of cooking equipment, it is common for many different age groups to share the cooking facilities of a house. At the same time, each group may have a different preference for cooking. For example, younger people may use a microwave oven; middle-aged people may use a stove or drum oven and barbecue, older people may prefer the ground and a fire for cooking. To this extent, there is a need to consider how many 'kitchens' each house may need.

- *Electric cooking: stoves and hotplates:* Electric hotplate cooking is one of the major sources of energy use in a house. To control costs, stove timer switches can be installed to cut off power after a set period. It has also been found that solid hotplates are more robust than coil elements.
- *Operational fridges:* Poorly performing fridges can lead to food spoiling and food poisoning as well as to high-energy costs. A number of simple directives can be applied to assist in overcoming these problems, for example ensuring that the fridge is located in a thermally efficient area and that door seals are regularly maintained. However, one problem with fridges in overcrowded households is frequent use, and the only solution here is to provide either more fridges or lower density housing.
- *Kitchen cleaning and maintenance:* The design and detailed specification of the kitchen area, joinery, and appliances can make cleaning easier by reducing cleaning effort and access for insects and vermin.
- *Food storage:* Low shelves and cupboards are easily accessed by dogs and children, or are unused or used to store non-food items. Consideration should be given to providing high shelves and cupboards and lock-up pantries that are insect-proof and well ventilated.

Figure 6.1. Distribution of environmental health hardware items requiring major repair or replacement: Thamarrurr, 2002



Key: 1. Basin; 2. Bench/shelf; 3. Cistern; 4. Door; 5. Drainage; 6. Electrical; 7. Boundary fence; 8. Floor drainage; 9. Food storage; 10. General structure; 11. Hot water service; 12. Kitchen floor; 13. Oven; 14. Septic tanks; 15. Shower; 16. Sink; 17. Storage; 18. Stove top; 19. Taps; 20. Toilet pan; 21. Trough; 22. Utensil storage; 23. Washing machine; 24. Water supply

Source: Northern Territory Government, Indigenous Housing Environmental Health Survey, customised tables

Clearly, then, data needs are very detailed, not just for the purpose of establishing the range and level of health hardware needs for each dwelling in the first instance, but for the ongoing monitoring of needs as they develop so as to inform maintenance programs.

The most recent IHANT environmental health survey in the Thamarrurr region was conducted in 2002/03. This reports on the adequacy of up to 96 individual items of health hardware for each room of each dwelling, as well as on the exterior condition of individual houses and associated yards and services. In line with the National Aboriginal Housing Guide these items are listed according to their contribution to healthy living practices such as ability to cook and prepare food, ability to wash clothes, and ability to wash people. In Thamarrurr, just over 8000 individual hardware items were reported on. In more than a quarter of cases (27%), this was to indicate that the item simply did not exist (for example a bedroom with no door, or a laundry with no washing machine). In five per cent of cases it was to report the need for minor repairs, and in 12 per cent of cases the item was found to be a health or safety hazard and was in need of either major repair or replacement. Thus, almost half of all the health hardware in Thamarrurr was found to be deficient in some way. Figure 6.1 provides an indication of the type of health hardware items reported as in need of major repair or replacement. This reveals that the most common deficiencies are related to storage (items 2, 9, 17, and 22) and taps (item 19), although it is striking that the distribution is across much of the range.