Maintenance of Ageing Social Housing Stock: Australian Asset Management in Practice

Russell Kenley,
Faculty of Business & Enterprise, Swinburne University of Technology
Department of Construction Management, Unitec Institute of Technology
rkenley@swin.edu.au
Christopher Heywood,
Faculty of Architecture, Building and Planning, University of Melbourne
c.heywood@unimelb.edu.au
Toby Harfield,
Faculty of Business & Enterprise, Swinburne University of Technology
tharfield@swin.edu.au

Abstract

According to the 2006 figures from the Australian Bureau of Statistics, 259,000 units of the Australian national public housing stock were built before 1980. At the same time the rate of new social housing being added has continued to decrease annually during the last 15 years. Therefore a major issue for all State Housing Authorities (SHAs) is ageing stock. In such a situation maintenance of current stock becomes a major factor in meeting an increased demand for government subsided housing. Thus the role of facilities maintenance is of primary importance and warrants research into current practice. This study of five State Housing Authorities found that Facilities Management Plans were used by all states. However, both internal and external factors prevented full implementation of these plans resulting in continued maintenance backlog. This backlog, combined with ageing stock, means that although implementation of predictive maintenance would be considered best facilities management practice, on average 60% of maintenance activity is responsive. Four of the five SHAs in this study did sometimes manage to have a slightly higher percentage of planned maintenance. But the lack of new stock, the growing need for affordable housing and long-term tenant demographic changes puts pressure on the social housing numbers. The SHAs in our study had good records to assist in the decision-making process when considering up-grades or disposal. At present less than 0.1% of ageing housing stock across Australia is considered beyond repair. Thus, despite the ageing stock all SHAs appear to be able to balance the tenure, financial, social and technical management priorities to meet Australian social housing policy expectations.

Keywords: Maintenance, Social Housing, SHAs, Australia

1. Introduction

Maintenance of approximately 349,000 public rental dwellings in Australia (AIHW 2010) is the responsibly of State Housing Authorities (SHAs). The SHAs are state government agencies that build, manage and maintain government subsidised rental housing for a variety of social needs.

This stock consists of public housing structures that are usually single family dwellings on estates, but also includes a small number of medium and high rise apartment buildings. The majority of public housing in Australia is located in major cities (71%), but a significant number of units (41,943) are located in small towns and rural areas (AIHW 2010). The variety of locations imposes significant maintenance challenges because of the large size of some Australian States (Western Australia 2.5M km^2, Queensland 1.7M km^2).

According to the Australian Bureau of Statistics (2006), 259,000 units of the Australian national public housing stock was built before 1980. At the same time the total number of new public housing stock has decreased in the last 15 years. Therefore a major issue for all SHAs is ageing stock.

In such a situation maintenance of current stock becomes a major factor in meeting an increased demand for government subsided housing. Thus the role of facilities maintenance is of primary importance and warrants research into current practice.

This paper reports on a study into facilities maintenance practices for the public housing stock of 5 Australian State Housing Authorities. The balance of the paper begins with an outline of Australian public housing in section two. Section three provides a description of the purpose and design of the research. Analysis of data pertaining to maintenance practices is the subject of section four. The paper ends with concluding remarks.

2. The Australian Housing Landscape

The majority of Australians live in privately owned dwellings. Australian households access accommodation either through owner occupation or by renting from a private landlord. However, a significant number of households encounter problems in acquiring or accessing suitable accommodation.

Some factors that cause accommodation problems are: high cost, lack of availability, or insufficient housing in location of employment. In addition, dwellings may not be available in the private rental market for households with special accommodation needs such as age or disability. For those with problems accessing housing, Australian State(6) and Territory(2) governments assist households through provision of public housing supported by Federal government funding.

Australia, one of many countries, has been committed to government subsided housing (social and public housing are inter-changeable in this paper, but differences in definition may apply in different

jurisdictions and at different times) since the 1950s. For the first 30 years State and Territory Housing Authorities (SHAs) focused on large acquisition programs to meet the needs of two target groups: low income families and older persons. As demand was high and the stock new, little attention was paid to long-term viability of the housing stock (Kenley et al., 2010).

However, during the 1980s concern about whether or not public housing dwellings were safe to live in, was one driver for social housing policy re-definition by government agencies. The initial public housing policy, based on the theory that much of the housing stock would be temporary accommodation, was obviously incorrect. A significant number of households had been in the same accommodation for 20 years or more (Milligan et al., 2006).

A second driver of change was a response to social housing tenant dissatisfaction concerning the condition of their housing. Much of this dissatisfaction was based on the poor structural condition of the dwellings. Indeed, the sub-standard condition of ageing housing stock became a major issue for government housing organisations in many jurisdictions around the world. (Jacobs et al., 2010)

2.1 Ageing social housing stock

According to the Australian Bureau of Statistics (2006), approximately 65 per cent (259,000 units) of the Australian national public housing stock was built before 1980. Figure 1 tracks the number of units built between 1960 and 2000. The graph shows that both public and private housing added the same number of new starts in 1960. However, as the private sector contribution has increased, public housing numbers have continued to decrease over time. While there is yearly fluctuation, the trend is evident. Between 1960 and 2000 private housing provided an average of 15.8 thousand new starts. During each of these years public housing provided an average of only 11.8 thousand new starts.

This pattern of decline in public housing construction in Australian, and internationally, is largely attributed by scholars to the change in the underlying philosophy of government policy makers (Dalton 2009; Turner & Whitehead, 2002).

The response by Australian governments at all levels in the 1990s to problems associated with an ageing public housing stock was to re-assign the role of government from housing service provision to housing market enabler (Heywood & Kenley, 2008; Walker 2001; Arthurson 1998). The SHAs policy of building less new stock was expected to provide an incentive for provision of social housing by non-government organisations. However, even though the number of new units provided by the private sector increased between 1960 and 2000, in 2009 less than 12% of social housing is owned by non-government agencies (AIHW 2010). The real outcome of the policy of reduced public sector building has been that all states in Australia remain the owners of significant numbers of ageing stock (Hall & Berry, 2004).

At the same time the number of households requesting public housing continues to out-strip supply. As at 30 June 2009, 177,652 households were on waiting lists for public rental housing (AIHW 2010). Thus, the role of government and affordable housing remains a topic for continuing research.

3. Research Design

The ageing public housing stock is of concern to both tenants and providers in many countries (van Mossel & Jansen, 2010; Hall & Berry, 2004; Allen & Hicks, 1996). A response to these concerns has been adoption of systematic asset management. Strategies for the management of assets employed by housing authorities have been diverse (Gruis & Nieboer, 2004; Turner & Whitehead, 2002; Larkin, 2000; Morrison, 2000). However, all appear to agree with Priemus et al. (1999) that to provide effective public rental accommodation management, four inter-related activities must be addressed:

1. technical management (maintenance, renovation);

2. social management (housing allocation);

3. financial management (treasury, rent policy); and

4. tenure management (letting, buying, selling).

Some authorities utilise a well-defined asset-based approach to tenure management activities involving acquisition, disposal, and sales. These of necessity have to work in tandem with technical management aimed at physical and structural improvements of the housing stock. Financial management practices may be the driving principle with investment into the physical asset through up-grades. Up-grades can include rectifying design defects plus addressing safety and security issues, especially in large public housing complexes. Research shows that concern about enhancing the local public housing environment produces both social and financial benefits (Larkin, 2000).

A focus on the technical management activities based on the physical assets can also be combined with the development of more localised management processes. Focused processes aimed at being more responsive to maintenance issues will ensure a sound structural asset. Improved processes addressing tenant dissatisfaction with structural conditions of public housing also supports increased social and financial benefits (van Mossel & Jansen, 2010; Randolph & Judd, 2000).

Data were collected through a series of surveys concerning taking into account the four types of management activities suggested by Priemus et al. (1999). This paper reports on technical management activities related to maintenance and renovation.

SHA asset managers were asked to provide details of asset management policies, records used in setting both maintenance and up-grading schedules as well as related financial data. Follow-up telephone interviews with public housing asset managers provided additional details about the status of their housing stock. Data were collected from five Australian states: Queensland (QGDOH, 2007), South Australia (DFC, 2008), Tasmania (Flanagan, 2007; AGT 2005), Victoria (Cameron, 2004) and Western Australia (DTF, 2005).

4. Analysis

The new public management reforms that evolved in different countries during 1990s were intended to provide financially effective performance from government assets. For example agencies providing social housing adopted new technologies and new operating models to monitor the four basic asset management activities technical, social, financial and tenure. However, scholars have found that public housing asset management reform policy implementation is often incomplete due to the lack of technical and economic capacity (Gruis & Nieboer, 2007; Milligan et al., 2006).

Essentially, the core of an effective asset management strategy requires accurate and relevant information about physical assets. To ascertain whether or not Australian State Housing Authorities have accurate and relevant information out their housing assets, asset managers were asked three questions relating to the maintenance activities:

Q1: Does your SHA have a Facilities Maintenance Plan?

Q2: Does your SHA have Condition and Maintenance Records?

Q3: What type of maintenance information is required to set priorities?

4.1 Does your SHA have a Facilities Maintenance Plan?

All SHAs in our study have at least one Facilities Maintenance Plan. However, the triple level of government within Australia means that all SHAs actually have more than one Facilities Management Plan, each adhering to a different set of regulations. Thus, SHAs internal management structures present barriers to utilising the most effective and efficient maintenance plan.

Table 1 shows that four of the five government public housing agencies are located in within larger government departments within their state. Only Western Australia has a dedicated Department of Housing. SHAs nested within larger government departments are constrained by competing policy and regulation documents.

Table 1: List of department responsible for social housing in five Australian states

Queensland (QLD)	South Australia (SA)	Tasmania (TAS)	Victoria (VIC)	Western Australia (WA)
Department of Communities (Housing & Homelessness Services)	Department for Families & Communities (Accommodation & Housing)	Department of Health & Human Services (Housing)	Department of Human Services (Housing & Accommodation)	Department of Housing

Multi-levels of organisational structure means that maintenance requirements for social housing will have competing maintenance priorities if compliance with more than one Facilities Management Plan (FMP). Table 2 shows that all of the SHAs in our study have between 8 and 15 FMPs. In each of these general plans to manage facilities, the detail of maintenance activities is often obscure.

The difficulty for the SHAs lies within the differing purposes of each Facilities Management Plan. For example, corrective maintenance is an attempt to deal with current problems with housing stock. This technical management activity is self-evident. However, from a financial perspective, preventative maintenance would be a priority activity because of the long-term benefit for the AHSs.

At the same time tenure activities should have priority because a predictive maintenance is the only realistic good management practice for a sustainable built environment. Predictability is based on life-cycle models whereas preventive maintenance is usually predicated upon the view of a long-term asset. The difference between the two is significant. Sustainability ideals for all built environment structures have their foundation in a life-cycle model of responsibility: build, maintain, retrofit, maintain, etc.

Table 2: Type & number of Facilities Management Plans

Type of maintenance indicated	*QLD*	*SA*	*TAS*	*VIC*	*WA*
Corrective	5	5	5	4	5
Preventative	5	1	3	5	2
Predictive	5	2	4	5	4
Total	15	8	12	14	11

As would be expected, a corrective maintenance plan is most widely used for facilities asset management by Australian SHAs. Most of the SHAs carry out annual cyclical maintenance and repairs. Asset managers indicated annual planned maintenance is one way of catching up on long-term under-maintenance for some of the housing stock. However, these repairs are a corrective activity. The SHAs in this study indicated that preventive maintenance is used less, because traditionally when government funding is limited, preventative or predictive sections of a FMP are not implemented.

4.2 Does your SHA have Condition and Maintenance Records?

Many of the SHAs discussed the limitations that a high percentage of ageing social housing stock imposed on following policy ideals and good maintenance practice. If 65 per cent of the national public housing stock is over 40 years old, clearly age has a major impact on repairs and maintenance requirements. Thus, an historical record would assist development and implementation of a Facilities Maintenance Plan.

Two major long-term external factors have been fundamental in limiting maintenance records. The problems presented by restructuring of government departments responsible for public housing means the loss of both organisational knowledge and maintenance records (Dalton, 2009). The on-going problem of rapidly and continuous changing technology are also obstacles to good record keeping practices. These externally imposed limitations effect the ability to focus on long-term maintenance practices.

Table 3 shows that all SHAs in this study were able to provide some historical information. Three SHAS have records of the general condition of their stock, while Tasmania and Western Australia (with smaller numbers of public housing units) do not have these data.

At the same time all states have data on three important factors to assist with maintenance activities: the categories of buildings, the site-survey history and the locations of all stock. In addition, one of the most important datasets collected by all states shows the difference between planned and responsive maintenance activities as noted in table 3.

Table 3: Maintenance record data sets available at five Australian SHAs

Maintenance Records	QLD	SA	TAS	VIC	WA
General conditions	Yes	Yes	No	Yes	No
Categories of buildings	Yes	Yes	Yes	Yes	Yes
Site survey history	Yes	Yes	Yes	Yes	Yes
Location	Yes	Yes	Yes	Yes	Yes
Maintenance, planned	Yes	Yes	Yes	Yes	Yes
Maintenance, responsive	Yes	Yes	Yes	Yes	Yes

4.3 Comparison of responsive and planned maintenance expenditure

Thomas et al. (2005) have written extensively about maintenance issues in social housing. They argue that the value of stock decreases along with a decrease in the amount of maintenance. They claim that lack of regular maintenance is directly related to the liveability of the stock. Thus, all public housing needs to have a regular *planned* maintenance to limit the amount of responsive maintenance required.

Australian SHAs in this study do use a combination of responsive and planned maintenance. Nationally almost 60% of maintenance spend is responsive. For example, between 2003 and 2006, studies show an average 7% growth in responsive maintenance expenditure. Given the small increase in housing stock numbers at this time, and the emphasis on up-grading ageing stock, these numbers suggest a significant level of deferred maintenance.

The study found variations between jurisdictions in the percentage of maintenance expenditure for planned and responsive maintenance in the financial year 2006/2006. South Australia is the only state that spent more on responsive maintenance than on planned maintenance. Technical management activities based on planned maintenance expenditure is considered good asset management practice. Therefore, Queensland (55%), Tasmania (91%), Victoria (66%) and Western Australia (51%) could all be considered to display good asset management practice.

Western Australia which is the only state with a stand alone Department of Housing spent slightly more (2%) on planned maintenance as on responsive maintenance. However, in three other states – Queensland, Tasmania and Victoria – the expenditure for planned maintenance out-stripped that spent for responsive maintenance. These figures would the expected outcome of following a Facilities Maintenance Plan ensuring to well-maintained stock that improves its financial value.

4.4 What type of maintenance information is required to set priorities?

Backlog maintenance appears to be an international concern for social housing. Even with a detailed Facilities Maintenance Plan with a significant amount of planned maintenance much of the public housing maintenance is not completed by the due date. In order to deal with this problem in Australia the SHAs develop annual regional housing stock maintenance plans and hold regional forums with key stakeholders to devise maintenance requirements priorities. Therefore, good stock condition datasets are required to make both long and short term maintenance plans.

Table 4 indicates four important criteria for development of prioritising maintenance expenditure: dwelling age, inspection results, structural problems and materials degradation All the SHAs have these records (with the exception of the missing records of materials degradation for Queensland).

Table 4: Decision-making factors for prioritising maintenance activities

Factors	QLD	SA	TAS	VIC	WA
Age of dwelling	Yes	Yes	Yes	Yes	Yes
Inspection results	Yes	Yes	Yes	Yes	Yes
Structural problems	Yes	Yes	Yes	Yes	Yes
Materials degradation	No	Yes	Yes	Yes	Yes

It is easy to understand why these records are so important. Each year the Australian Institute of Health and Welfare publishes data on the number of social housing dwellings that are untenantable. For example, between 2007 and 2010, the number of untenantable dwellings increased from 1988 to 3163.

State housing authorities in Australia are able to use the factors listed in table 4 to support their decision-making processes. Identification of untenantable stock has two internal drivers for change,

disposal of untenantable stock or up-grading stock that to an expected standard. The question of whether or not to up-grade or renovate current stock is not only based on the condition of the stock.

The changing demographics, growing waiting lists for affordable housing, gentrification of neighbourhoods and improved building codes are external drivers for change. These external factors along with the internal factors on the condition of the stock assist the SHAs consider how to balance the tenure, financial, social and technical management priorities to meet social housing policy outcomes (Straub, 2009).

5. Conclusion

This study has shown that SHAs in Australia are able to provide effective social housing management and development by focusing on four inter-related facilities management activities: technical, social, financial and tenure.

At the same time a high percentage of ageing social housing stock complicates implementation of good maintenance practice. Currently 65 per cent of the national public housing stock is over 40 years old which has a negative impact on repairs and maintenance. Because of this much of the maintenance activity remains back-logged due to the growing gap between ageing housing stock and the number of new units becoming available.

Because all Australian State Housing Authorities have limited funding, much of the maintenance is responsive, about 60% nationally, rather than predictive. Thus, a Facilities Maintenance Plan that has a significant target for planned and predictive maintenance is doomed to failure.

Acknowledgement

References

(ABS) Australian Bureau of Statistics (2006) *Building Approvals Data Series*. Australian Bureau of Statistics, Canberra, Australia.

(AGT) Auditor General of Tasmania (2005) *Public Housing: Meeting the Need? 57 edn*. Tasmanian Audit Office, Hobart, Australia.

(AIHW) Australian Institute of Health and Welfare (2010) *A Profile Of Social Housing In Australia.* Report 232, Australian Institute of Health and Welfare, Canberra, Australia.

Allen, S & Hinks, J (1996) "How Long Should Housing Last? Some Implications of the Age and Probable Life of Housing in England." *Construction Management and Economics* **14**: 531-535.

Arthurson, K (1998) "Redevelopment of Public Housing Estates: The Australian Experience." *Urban Policy and Research* **16**: 35-46.

Boussabaine, AH & Kirkham, RJ (2004) "Simulation of Maintenance Costs in UK Local Authority Sport Centres." *Construction Management and Economics* **22**: 1011-1020.

Cameron, J. (Ed.) (2004) "Maintaining Public Housing Stock." In *Auditor General Report*, Government of Victoria, Melbourne, Australia.

Cooper, J & Jones, K (2008) "Routine Maintenance and Sustainability of Existing Social Housing." *In the Proceedings of the CIBW070 Conference in Facilities Management, 2008*, *Edinburgh*. Heriot Watt University, UK.

Dalton, T (2009) "Housing policy retrenchment: Australia and Canada compared." *Urban Studies* **46**: 63-91.

(DFC) Department of Families and Communities (2008) *Housing SA: Asset Strategy and Regional Planning*. Government of South Australia, Adelaide, Australia.

(DTF) Department of Treasury and Finance (2005) *Strategic Asset Management Framework for Western Australian Public Sector Agencies*. Government of Western Australia, Perth, Australia.

Flanagan, K (2007) *Housing: Building a Better Tasmania*. Tasmanian Council of Social Services Hobart, Australia.

Gabriel, M & Jacobs, K (2006) "Opportunities and Constraints in State Housing Policy: The Example of Tasmania's 'Affordable Housing Strategy'. *Urban Policy and Research* **24**: 539–551.

Gruis, V & Nieboer, N (2004) "Strategic Housing Management: An Asset Management Model for Social Landlords." *Property Management* **22**: 201–213.

Hall, J & Berry, M (2004) *Sustainable Financing for Public Housing Authorities*. AHURI Research & Policy Bulletin. Australian Housing and Urban Research Institute, Melbourne, Australia.

Heywood, C & Kenley, R (2008) "The Sustainable Competitive Advantage Model for Corporate Real Estate." *Journal of Corporate Real Estate* **10**: 85–109.

Jacobs, K, Atkinson, R, Spinney, A, Colic-Peisker, V, Berry, M and Dalton (2010) *What Future for Public Housing? A Critical Analysis*. Report 151, Australian Housing and Urban Research Institute Melbourne, Australia.

Jones, K & Sharp, M (2007) "A New Performance-Based Process Model for Built Asset Maintenance." *Facilities* **25**: 525-535.

Kenley, R, Chiazor, M, Hall, and Heywood, C (2010) *Good Practices for Managing Australia's Public and Community Housing Assets*, Report 148, Australian Housing and Urban Research Institute Melbourne, Australia.

Langevine, R, Allouche, M and Rizk, S A Rizk (2006) "Decision Support Tool for the Maintenance Management of Buildings." *In the Proceedings of the Joint International Conference on Computing and Decision Making in Civil and Building Engineering*, June 14-16, 2006, Montréal, Canada.

Larkin, A. (2000) *Asset Management Strategies: A Review of Asset Management Strategies of Housing Associations in England and Social Housing Providers in Australia.* Metropolitan Housing Trust/The Housing Corporation. London, UK.

Levitt, Joel (2003) *Complete Guide to Preventative and Predictive Maintenance*, New York, Industrial Press.

Milligan, V R Dieleman, F M and van Kempen, R (2006) "Impacts of Contrasting Housing Policies on Low-Income Households in Australia and the Netherlands." *Journal of Housing and the Built Environment* **21**: 237–255.

Morrison, N (2000) "Examining The Difficulties of Letting Social Housing within England." *geojournal* **51**: 339-349.

Priemus, H, Dieleman, F and Clapham, D (1999) "Current Developments in Social Housing Management." *Netherlands Journal of Housing and the Built Environment* **4:** 211–223.

(QGDOH) Queensland Government Department of Housing (2007) *Asset Strategic Plan 2007–2012*. Queensland Government Department of Housing, Brisbane, Australia.

Randolph, B & Judd, B (2000) "Community Renewal and Public Housing Estates." *Urban Policy and Research,* **8**: 91–104.

Shen, QP, Lo, KK and Wang, QA (1998) "Priority Setting in Maintenance Management: A Modified Multi-Attribute Approach using Analytic Hierarchy Process." *Construction Management and Economics*, **16**: 693-702.

Straub, A (2009) "Dutch Standard for Condition Assessment of Buildings." *Structural Survey* **27**: 23-35.

Thomas, A Johnson, P and Veale, R (2005) Right First Time: How Housing Associations are Improving their Responsive Repairs. Chartered Institute of Housing, Coventry, UK.

Turner, B & Whitehead, C M E (2002) "Reducing Housing Subsidy: Swedish Housing Policy in an International Context." *Urban Studies* **39**: 201–217.

van Mossel, H-J & Jansen, SJT (2010) "Maintenance Services in Social Housing: What Do Residents Find Important?" *Structural Survey* **28**: 215-229.

Walker, RM (2001) "How to Abolish Public Housing: Implications and Lessons from Public Management Reform." *Housing Studies* **16**: 675–696.

Wang, C (2008) "Distributed Scheduling for Reactive Maintenance of Complex Systems." *IEEE Transactions on Systems, Man, and Cybernetics, Part C* **38**: 269-273.