The Effectiveness of Strategies for Crime Reduction in Areas of Public Housing Concentration

Bruce Judd Robert Samuels Jack Barton UNSW-UWS AHURI Research Centre

ABSTRACT

Vulnerability to crime is a common problem on large public housing estates, and therefore a key issue in the public housing estate regeneration programs that have emerged in all states of Australian in the last decade (Randolph et al, 2005). Three broad categories of regeneration strategies can be identified: physical/spatial, social, and managements interventions, and various regeneration programs adopt different mixes of these (Randolph and Judd, 2000). The effectiveness of these strategies in reducing crime is therefore a critical question.

This paper discusses the findings of an AHURI (Australian Housing and Urban Research Institute) funded research project investigating the relationships between community regeneration strategies and crime reduction in areas of public housing concentration (Judd et al 2002, Samuels et al 2004 and 2005). Nine study areas were selected across three states – three involving major physical/spatial interventions, three with predominantly social interventions and three 'control' areas without any formal regeneration program.

The methods used included stakeholder (police and housing agency) interviews, walk through CPTED (Crime Prevention Through Environmental Design) analysis of the built environment, analysis of police crime data over a five year period, spatial analysis of mapped crime data and a community survey. An innovative method for mapping crime at the micro level was developed revealing hotspot areas and their changes over time. Three indicators were developed from the crime data: a Crime Experience Indicator (CEI) indicating the likelihood of experiencing crime in a given period, a Hotspot Experience Indicator (HEI) measuring crime experienced in the hotspot areas as a function of the population of the study area, and a Crime Reduction Indicator (CRI) measuring hotspot crime reduction.

Crime was found to be reducing in three areas, but only marginally in one. One was an estate with substantial physical/spatial interventions, but also with a broad whole-of-government social intervention program and the other an estate with minimal physical/spatial interventions but also with a broad whole-of-government place focussed program. Both had localised, empathetic housing management and community policing teams.

The study concluded that crime was endemic in areas of public housing concentration, hotspots were strongly associated with clusters of public housing stock and radiated out into surrounding private housing areas. Physical environmental factors were not found to be strongly associated with hotspots but low night illumination and lack of activity, particularly after dark, were identified as

-

¹ Copies of the Positioning Paper, Final Report and Research and Policy Bulletin for this project can be downloaded in PDF format from the AHURI website: www.ahuri.edu.au

typical criminogenic characteristics of the study areas. Broadly based social interventions were found to be more effective in crime reduction that physical/spatial interventions, along with community friendly housing management and policing. Community survey results indicate an association between crime reduction and neighbourhood cohesion using Buckner's (1988) instrument, and with residents' perceptions of safety (particularly at night) and crime reductions.

The study confirms concerns about the relationship between large public housing concentrations and crime, the ineffectiveness of physical/spatial interventions unless accompanied by broader social interventions and the value of empathetic localised intensive housing management and community policing. It also offers a new approach for spatial analysis of crime patterns over time at the micro level.

INTRODUCTION

Large estates are a product of the first three decades of Australian post war public housing programs constructed under the early Commonwealth State Housing Agreements (CSHA). With the emphasis firmly on production, this was seen as an effective way of taking advantage of the economies of scale by building large numbers of dwellings at relatively low cost on cheap land – either on the urban periphery or on inner city slum clearance sites. During the 1980s as problems began to emerge on the large estates, this form of public housing development ceased with the conventional wisdom changing in favour of dispersing social housing in the community – the so called 'salt and pepper' approach. However the existing estates remained and by the late 1980s and early 1990s many were in crisis – both in physical and social terms. Physically, much of the housing stock was ageing, had been poorly maintained and outdoor spaces had often become degraded by vandalism, graffiti, rubbish and abandoned vehicles (NCPA, 1993; SGS, 2000). Socially, the decline in funding for public housing and the subsequent targeting of allocations to those most in need led to increasing levels of disadvantage on the estates with an escalating number of clients with complex needs, and an increase in the associated problems of unemployment, poor educational attainment, drug and alcohol abuse, crime and anti social behaviour (Arthurson, 1998; Randolph & Judd, 2000, Judd et al, 2002).

In response, all state governments have developed policies to address these problems – known generally as community 'renewal' or 'regeneration' policies. These vary somewhat between jurisdictions, both in terms of the strategies and funding models adopted, but generally involve interventions at one or more of the following levels:

- **Physical/spatial interventions** including housing upgrades, urban design and infrastructure improvements and de-concentration via asset sales and/or redevelopment.
- **Social interventions** including tenant consultation/participation, community development, crime prevention initiatives, youth programs, drug and alcohol programs and employment, and training and social enterprise development.
- **Management interventions** including localised housing management teams, interagency and whole of government service coordination, place management and outsourcing housing management to the community or private sectors (Randolph & Judd, 2000).

While the earlier renewal programs of the late 1980s and early 1990s were strongly focussed on physical improvements to houses and neighbourhoods it soon became evident that these were of limited value without addressing the underlying social issues and involving tenants in the process (NCPA, 1993). So by the mid 1990s tenant consultation/participation had become an integral part of most renewal programs and partnerships with other human service agencies also began to emerge.

By the late 1990s in some jurisdiction these partnerships had extended further to sophisticated whole of government, place management approaches. In others, partnerships with the private sector to de-concentrate estates through redevelopment and tenure diversification were also being explored. Today, most jurisdictions are actively involved in, or contemplating, significant private sector involvement in estate redevelopment with the aim of reducing public housing concentrations.

Addressing problems of crime and anti-social behaviour features strongly amongst the objectives of most community renewal programs (Randolph et al, 2005). While there has been anecdotal evidence that some renewal programs have had a positive impact on levels of crime (eg. Randolph et al, 2001) empirical evidence has been scant. In 2001 the Australian Housing and Urban Research Institute funded a research project led by the authors to investigate the linkages between housing, policing and other interventions for crime and harassment reduction in such areas. This involved a study of crime patterns in nine areas of public housing concentration, in three states of Australia over a five-year period (four in one state²) concurrent with community renewal programs in six of the estates. The central question of the research was to what extent community renewal interventions had impacted on crime, and what kinds of intervention were most effective. Of particular interest were the relative effectiveness of physical/spatial versus social approaches and the role of interagency partnerships.

Ever since Oscar Newman's seminal research in the 1970s (Newman, 1972) into crime and public housing design in the USA, the relationship between public housing design and crime has been contested. Critics of the so called 'design hypothesis' argue that such apparent associations between crime and public housing design have more to do with concentrations of socio-economic disadvantaged residents through increased targeting of public housing (the 'allocation hypothesis') rather than with housing design per se (eg. Weatherburn et al, 1999; Matka, 1997). Yet amongst housing and some police agencies there has been a growing acceptance of CPTED (Crime Prevention Through Environmental Design³) which "...has as its basic premise that the proper design and effective use of the physical environment can lead to a reduction in the incidence and fear of crime..." (ICA, 2005, McCamley, 1994 & 1999). However social researchers suggest that physical design interventions alone have little impact on crime and advocate social approaches that address the causes of disadvantage (eg. Osborn & Shaftoe, 1995; Stubbs & Storer, 1996; Stubbs & Hardy, 2000). A third perspective, common amongst police, politicians and the public promotes law enforcement methods such as increasing police patrols and a 'zero tolerance' approach to crime.

RESEARCH APPROACH AND METHODOLOGY

A case study approach was adopted with three areas of public housing concentration selected from each of three states, making a total of nine study areas. In each state the three cases were selected to represent different intervention strategies - one adopting a primarily physical/spatial approach, one a social approach and one 'control' case with no formal renewal program. An attempt was made to match the areas as much as possible in terms of urban location (outer suburbs) and to some extent according to the size of the study area and number of public housing dwellings. All six 'renewal' areas (two in each state) had active renewal programs commencing close to the beginning of the five-year study period (1997/8-2001/2).

³ CPTED principles include natural surveillance, access control, territorial reinforcement and space management.

-

² Due to availability of geo-coded police data

Methods used in the research included:

- 1. Documentation of the public housing areas (drawings and housing data)
- 2. Key stakeholder interviews with housing and police officers involved in each area
- 3. Analysis of 2001 ABS Census demographic statistics for each area,
- 4. Expert walk-through CPTED appraisal of the estates (before and after crime data analysis)
- 5. Analysis of police crime data over a 4 or 5 year study period (depending on availability of geo-coded data)
- 6. Mapping of crime incidents for the area including at the micro scale to identify crime hotspots, and
- 7. A neighbourhood crime and safety survey.

Crime incident mapping was undertaken using Mapinfo GIS software with public housing properties identified on the cadastre. Crime incidents were coded with symbols representing different offence categories and colours representing different years enabling a visual spatial and temporal analysis right down to the micro scale. Figure 1 is an example of mapped crime incidents at the micro scale identifying a hotspot associated with public housing properties shown in black.



Figure 1 Typical Crime Incident Map at the Micro Level

This approach was used to identify all hot spots in each housing area – ie locations of concentrated and recurrent crime - as illustrated below in Figure 2, again with public housing properties shown in black.



Figure 2 Identified Hot Spots in a Study Area

Because of the sensitivity and privacy concerns of spatially located crime data, and the risk of adding to the stigmatism of the selected communities, all spatial identifiers (place and street names) were removed from maps and numerical coding was used for both states and housing areas in the report. A confidential report identifying locations was provided to each participating housing and police agency.

Crime statistics were collected at three levels – the housing area itself, the immediate context (the ring of CDs (or suburbs) immediately surrounding the area, the Local Government Area and the Metropolitan Area - both to contextualise the findings and investigate any possible displacement or halo effects. In two states these were collected over a five-year period coinciding with the early stages of the renewal programs, and in the other state over a four-year period because of the lack of geo-coded data for the earliest year.

Because conventional crime rates (normally expressed per 100,000 of the population) are not very meaningful for analysis of crime activity at the scale of these study areas (3,000-10,000 residents), let alone at the micro-scale at which hotspots are analysed, three indicators were developed to represent the extent of crime experienced in a housing area, its concentration into hotspots and how these changed over time. These were:

- **Crime Experience Indicator (CEI)** crime experienced in the study area annually expressed as a percentage of the population
- **Hot Spot Indicator (HEI)** crime experienced in a hotspot as a percentage of population in the whole study area
- Crime Reduction Indicator (CRI) the percentage of hotspots in a study area with reducing crime

The analysis of crime statistics was complemented by a neighbourhood crime and safety survey conducted in each area used a 'snowballing' recruitment technique via community networks. The survey consisted of four components – first biographical data, second questions concerning perceptions of change (including in levels of crime & harassment), third Buckner's (1988) 18 statement instrument for measuring neighbourhood cohesion (plus Vinson's (1995) similar four safety statements) and finally, mapping of crime experiences over the five year period (including whether experienced day or night and if reported or unreported). Interviews were undertaken in local community centres or agencies, and crime experiences and fear of crime were recorded

directly onto digital maps using a laptop computer. The latter were used to produce both fear and victimisation maps (See Figure 3 below). Despite small sample sizes in some of the study areas, and hence difficulties in establishing statistical significance, this data did provide an additional perspective on the experience of crime in the study areas from the residents perspective.

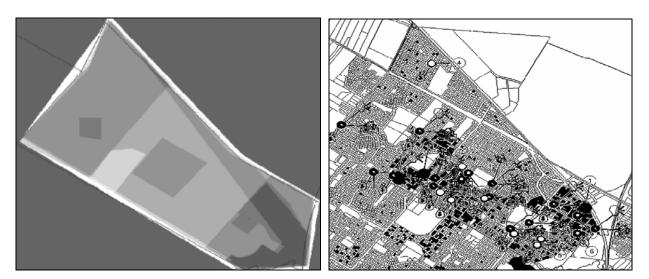


Figure 3 Fear After Dark (left) and Victimisation Maps (right) for One Study Area (Darker areas on the fear map represent higher levels of fear after dark)

RESEARCH FINDINGS

Study Area Characteristics

All estates selected were in outer suburban environments. Housing types were predominantly cottages and town houses. Two estates were of 'Radburn' design layout with back to front houses and hierarchical, cul-de-sac street arrangements. The concentration of public housing varied considerably in the six areas with renewal programs (25-77%) and was generally lower in the 'control' areas (13-23%). The number of public housing units in the study areas in 2001 ranged from 456 to 1090. Only one estate had been subject to significant de-concentration with a 30% reduction in public housing stock. In the others reductions in public housing stock in recent years were minor. The age of public housing in the study areas varied from 18 to 50 years, sometimes varying considerably within one estate.

The demographic profiles of the nine study areas at the 2001 ABS Census data were inconclusive as 'predictors' of crime, given the overall consistency across the areas in cultural, economic, educational and household characteristics. Furthermore, indicators which theoretically might be associated with higher crime - such as low incomes, single female parents or lone males, do not help explain crime reductions and increases in this study. Neither does percentage of socially marginalised populations: indigenous and/or ocean islander residents for instance. Possibly, in one area where crime was found to be increasing most, the higher percentage of elderly people, who might be more vulnerable, might have been a factor.

Nature and Extent of Interventions in the Study Areas

Stakeholder interviews revealed that the number of agencies involved and initiatives adopted varied considerably between study areas. Also areas selected as 'physical/spatial' or 'social' intervention types also had other interventions. Table 1 summarises the actual levels of physical/spatial and social intervention in all the nine study areas.

-

⁴ 'Radburn' layouts are based loosely on an innovative 1930s housing project in Radburn, New Jersey which featured superblocks, hierarchical cul-de-sac road layouts, separation of vehicular and pedestrian access, back to front houses and a connected spine of public open space for pedestrian access from housing to community facilities.

Table 1 Level of Physical/Spatial and Social Interventions by Housing Area

Intervention Type	State/Area No.	Physical/Spatial Intervention	Social Intervention
	1.1	High	High
PHYSICAL/	2.1	High	Moderate
SPATIAL	3.1	High	High
	1.2	Moderate	High
SOCIAL	2.2	Low	High
	3.2	Low	High
	1.3	Moderate	Low
CONTROL	2.3	Low	Moderate
	3.3	Moderate	Low

Two of the 'physical/spatial' intervention areas also had a high level of social interventions, and the other a moderate level. However in the 'social' intervention areas, physical/spatial interventions were low in two cases, and moderate in the other. Neither were the 'control' areas without some low to moderate 'physical/spatial' or 'social' interventions despite the lack of a formal renewal program. High 'physical/spatial' interventions usually involved significant upgrades to dwellings, urban environment and infrastructure and in some cases property sales and/or redevelopment of public housing properties. High 'social' interventions involved extensive tenant consultation/participation, partnerships with local government and multiple agency interventions and partnerships across a wide range of human services including education and training, youth and family services, health and recreation, drug and alcohol programs, community arts and crafts and a variety of community safety and crime prevention programs. See Appendix 1 for a summary of participating agencies and interventions for each of the nine study areas.

Crime Trends in the Nine Study Areas

Table 2 is a summary of CEI, HEI and CRI findings for the nine study areas. Over the 4-5 year study period, crime was found to be endemic and recurrent in most of the study areas. Average CEIs (ie. average number of crime incidents annually expressed as a percentage of the study area population) ranged from 7% to 30% but was generally higher in the 'renewal' areas (16-30%) than in the 'control' areas.

Using the CEI as a measure of the annual experience of crime, crime was found to be reducing in only three areas as shaded on the table, albeit only marginally in Area 3.3. The two with the greatest percentage reduction in CEI (Areas 3.1 and 2.2) were also among the highest in average CEI over the study period (30% and 21%), indicating a higher starting point. Interestingly, areas experiencing reductions under this measure included one from each of the intervention type categories. However it should be noted that the 'physical/spatial' intervention area also included a high level of 'social' intervention whereas the 'social' intervention area had little in terms of 'physical/spatial' interventions (see Table 1 and Appendix 1). Despite having no formal renewal program, the 'control' area showing marginal reductions in CRI over the study period had a moderate level of physical/spatial intervention and a low level of social intervention (See Appendix 1 for details).

Table 2 CEI, HEI and CRI for the Nine Study Areas x Intervention Type

	C	EI		C	RI	
State/Area	Average	% Change	HEI	Property	Personal	Intervention
	4 or 5 yrs	4 or 5 yrs		Crime	Crime	Type
1.1	22%	+4%	6.3%	15%	54%	
2.1	17%	+4%	4.8%	33%	8%	PHYSICAL/
3.1	30%	-10%	9.0%	58%	42%	SPATIAL*
1.2	17%	+3%	4.4%	15%	48%	
2.2	21%	-4%	10.2%	100%	70%	SOCIAL
3.2	16%	+2%	4.2%	14%	29%	
1.3	17%	+9%	8.6%	0%	22%	
2.3	7%	+1.5%	0.9%	40%	40%	CONTROL
3.3	10%	-0.5%	4.8%	45%	36%	

^{*} Note that Areas 1.1 and 3.1 also had high levels of social intervention (See Appendix 1)

Findings for HEI (crime experienced in hotspots as a percentage of population in the study area) is also highest in the two study areas with the highest reductions in CEI – again suggesting more intense concentration of crime in hot spot areas – and hence also a higher starting point. Likewise CRI figures (percentage of hotspots where crime is reducing) in Table 3, given separately for property and personal crime categories, also show the highest reductions in Areas 3.1 and 2.2 for property crime although a little less so for personal crime.

Spatial analysis of crime patterns revealed that hot spots were invariably, but not exclusively associated with concentrations of public housing properties in the study areas. For example, Figure 4 below shows a study area with nine hotspots of varying intensity – seven of which are located at clusters of public housing properties (shown in black) and two in private housing areas



Figure 4 Hot Spots and Public Housing Clusters

The efficacy of strategies in the nine study areas is summarised diagrammatically in Figure 5 below where crime reduction in terms of the percentage of hot spots cooling is shown separately for property and personal crime (on the lower scale) and combined (on the upper scale) with upward arrows representing positive efficacy – or reductions in hotspot crime. These correspond with the areas showing crime reductions according to the CEI measure for the housing area as a whole. The mix of physical/spatial and social interventions is also shown.

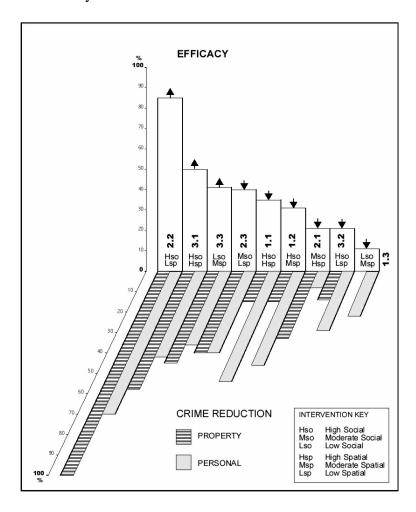


Figure 5: Intervention Efficacy Diagram

Context Data, Displacement and Halo Effects

When trends in the two areas where crime was found to be reducing markedly are examined in relation to surrounding 'context' suburbs, it was found that in one area (3.1) downward crime trends were not reflected in immediate suburbs or the metropolitan area, but are in the local government area. This could suggest displacement of crime to surrounding areas, but is inconclusive in terms of causal relationships. In the other area (2.2) downward crime trends were reflected in surrounding 'context' suburbs but not in the local government area or metropolitan area which both had increasing crime trends. This could represent a halo effect from crime reduction in the study area, but without more complex analysis is difficult to establish conclusively.

Neighbourhood Crime and Safety Survey Findings

Despite small samples in some areas, survey findings generally corresponded with findings based on crime statistics. Fear mapping was found to generally correspond with hot spots identified by mapped police crime data. Within the two states where the two study areas with clearly reducing crime were located, neighbourhood cohesion was also found to be greatest in the areas showing reductions (Areas 2.2 and 3.1) as were perceptions of safety.

Aggregated survey results also identified that perceived changes for the better across the housing areas were 'improved physical environment (43% of respondents), 'community facilities/activities (27%), 'safety and security' (23%), 'transport' (20%) and 'social/community wellbeing' (18%). The most prominent perceived changes for the worse by respondents on all estates were 'crime/nuisance/annoyance' (39%) and 'closure of services' (18%), indicating that crime and related issues are still a major issue of concern in many of the study areas.

Perceived changes in crime and harassment over 'recent years' also confirmed the findings based on crime statistics. These are summarised on Table 3 below which aggregates the 'much better'/'better' and 'much worse'/'worse' categories. Areas 2.2 and 3.1 were clearly more highly rated as improved with over half the respondents indicating that changes were 'much better' or 'better' as compared to one third or less in the other study areas. The evidence from the survey was therefore largely convergent with that based on crime statistics.

Table 3. Perceived Changes in Crime and Harassment by Housing Area

	Perceived Change			
State/Area	Much Better/ Better	About the Same	Much Worse/ Worse	Uncertain
2.2	59%	24%	12%	6%
3.1	52%	14%	20%	12%
Other Areas	19-34%	8-38%	31-56%	10%

Environmental Design Factors

The expert walk-through analysis according to CPTED criteria was conducted both before and after crime mapping and did not reveal any strong association between criminogenic environmental features and concentrations of crime. In fact, evidence was counterintuitive in some important cases, with the most dramatic crime reduction evident in a relatively unmodified 'Radburn' housing layout area yet increasing crime in another that had been radically 'normalised'. However two key environmental factors were identified as being associated with the generally high levels of crime present in many of the study areas – low illumination and dormancy (lack of activity) in public spaces after dark. This was especially the case when large areas of public space were present – whether associated with school grounds or 'Radburn' type open space. The extremely low-density residential settings with highly privatised space and lack of a sense of public realm also typically do not facilitate natural surveillance in public spaces .

CONCLUSIONS

The study found that there are strong associations between crime, fear of crime and public housing concentrations. Crime hotspots in all study areas were more likely to be associated with clusters of public housing properties. These were generally mirrored in the fear maps produced from the community crime and safety survey. Crime appears to diffuse outward from these hotspots into nearby private housing areas.

Recorded crime was reducing in only three of the study areas, and only marginally in one of these. What these two housing areas had in common was a high degree of social intervention via a whole of government approach to addressing problems of disadvantage and, in particular, localised community-friendly, housing management and community policing (see Appendix 1). Physical/spatial interventions, including 'Radburn' reversals and de-concentration, did not appear to be a significant factor associated with crime reductions – in fact all but one 'physical/spatial' intervention area including a 'Radburn' reversal case actually experienced increases in crime over the study period. Greater levels of neighbourhood cohesion and positive perceptions of change from the community survey appear to confirm findings based on recorded crime statistics.

The study findings support the view that social interventions are more effective than physical/spatial interventions in reducing crime in disadvantaged public housing areas, and conversely that without supporting social strategies physical/spatial interventions are limited in reducing crime. However two environmental design factors do appear to be associated generally

with the high levels of crime in the study areas. These are lack of illumination after dark and lack of un-activated public spaces (eg parks and school yards). These factors are likely to increase opportunities for crime and contribute to fear of crime particularly after dark.

The use of GIS mapping techniques developed for this research to study crime patterns over time at the micro level are a useful tool for investigating the relationship between crime, public housing and community renewal interventions. However caution must be maintained about assuming causal relationships between interventions and outcomes as crime is a complex phenomenon subject also to other external factors that were not able to be fully considered within the scope of this study.

REFERENCES

- Arthurson, K. (1998) 'Redevelopment of Public Housing Estates: The Australian Experience', *Urban Policy and Research*, 16(1):35-46.
- Buckner, J. (1988) 'The Development of an Instrument to Measure Neighbourhood Cohesion', *American Journal of Community Psychology*, 16(6):771-791.
 - International CPTED Association (ICA) (2005) Internet: http://www.cpted.net/home.html
- Judd, B., Samuels, R. and O'Brien, B. (2002) *Linkages Between Housing, Policing and Other Interventions for Crime and Harassment Reduction on Public Housing Estates (Positioning Paper)*. Melbourne, Australian Housing and Urban Research Institute.
- Matka, E. (1997) *Public Housing and Crime in Sydney*. Sydney, New South Wales Bureau of Crime Statistics and Research.
- McCamley, P. (1994) Safer by Design: A Practical Guide to Creating Safer Communities, Sydney, NSW Police Service.
- McCamley, P. (1999) *Crime, Design and Urban Planning,* A Report to the Department of Urban Affairs and Planning, Sydney NSW.
- National Capital Planning Authority (NCPA) (1993) *Restructuring Public Housing Precincts* (Occasional Paper Series 1, paper 4 prepared for the Better Cities Program. Canberra, Australian Government Publishing Service.
- Newman, O. (1972) Defensible Space: Crime Prevention through Urban Design. New York, Macmillan.
- NSW Department of Urban Affairs & Planning (DUAP) (2001) Crime Prevention and the Assessment of Development Applications, Sydney.
- Osborn, S. and Shaftoe, H. (1995) *Safer Neighbourhoods? Successes and Failures in Crime Prevention*, London, Safer Neighbourhood Unit.
- Randolph, B. and Judd, B. (2000) 'Community Renewal and Public Housing Estates', *Urban Policy and Research*, 8(1):91-104.
- Randolph, B. and Judd, B. (2006 forthcoming) 'Qualitative Methods and the Evaluation of Community Renewal Programs in Australia: towards a national framework', *Urban Policy and Research*.
- Randolph, B., Judd, C. and Carmichael, C. (2001) *Evaluation of the Neighbourhood Improvement Program for the NSW Department of Housing* (unpublished report). Urban Frontiers Program UWS and the Faculty of the Built Environment UNSW.
- Randolph, B., Judd, B. and Ruming, K. (2005) *Unpublished research on Aims and Objectives of Australian Community Renewal Programs for the NSW Department of Housing*. Kensington, City Futures Centre, University of New South Wales.

- Samuels, R., Judd. B., O'Brien, B. and Barton, J. (2004) *Linkages Between Housing, Policing and Other Interventions for Crime and Harassment Reduction in Areas with Public Housing Concentrations (Final Report)*. Melbourne, Australian Housing and Urban Research Institute.
- Samuels, R., Judd, B. (2005) *Public Housing, Policing and Crime Reduction*. AHURI Research and Policy Bulletin, Issue 55. May 2005. Melbourne, Australian Housing and Urban Research Institute.
- Spiller Gibbins Swan (SGS) Pty Ltd (2000) *Public Housing Estate Renewal in Australia*. Project No. 212, Australian Housing Research Fund.
- Stubbs, J. and Hardy, M.. (2000) *Evaluation of Three Neighbourhood Renewal Strategies*, Liverpool, NSW Department of Housing, South Western Region.
- Stubbs, J. and Storer, L. (1996) *Social Cost-Benefit Analysis of Department of Housing's Neighbourhood Improvement Program, Case Study Airds* (prepared for NSW Dept of Housing, Western Sydney Region.
- Vinson, T. (1995) *Waterloo Estate Survey: Preliminary Findings*, Kensington, School of Social Work, University of New South Wales.
- Weatherburn, D., Lind, B. and Ku, S. (1999) 'Hotbeds of Crime? Crime and Public Housing in Urban Sydney', *Crime and Delinquency*, 45(2):256-271.

APPENDIX 1 AGENCIES AND INTERVENTIONS IN THE NINE STUDY AREAS

Area and Agencies	Social Intervention Level	Physical/Spatial Intervention Level
STATE 1		
Housing Area 1.1 Commenced: 1998 Stock reduction: 30% Agencies involved: Housing Local government Police Human Services Attorney Generals	High Change social and tenure mix, community development worker, individual and group community consultation, interagency social services coordination, youth worker, crime prevention and area specific police liaison officer, multi-agency crime prevention committee, safety audit and hot spot identification, graffiti management program, early intervention program, housing security education, interagency domestic violence strategy, community conferencing	High Public housing upgrades, significant reduction of public housing concentration through sales, demolition and redevelopment by private sector, public domain upgrades, community centre, youth recreation facility
Housing Area 1.2 Commenced: 1995 Stock reduction: Few Agencies involved Housing Local government Police Attorney Generals Education & training Community services	High Increase social/tenure mix, interagency collaboration and referral group, multi-cultural programs, family programs, youth at risk program, family conferencing, domestic violence program, housing security education, local government crime prevention officer, problem oriented policing — targeting offenders, licensed premises opposing bail	Moderate Upgrade public housing (since 2000), some sales and new purchases in low concentration areas, tree planting by local council
Housing Area 1.3 Commenced: N/A Stock reduction: Few Agencies involved: Housing Police Family/youth services Mental health Transport	Low Interagency meetings, community development (since 2000), gardening training, community policing, crime prevention program, safety audit, hot spot monitoring & targeting, targeting individual offenders (POP focus)	Moderate Public housing upgrades, security upgrades, some sales to tenants, community centres

STATE 2		
Housing Area 2.1 Commenced: 1998 Stock reduction: 5% Agencies involved: Housing Police Juvenile Justice Mental Health Employment agencies	Moderate On-site management team, community development worker, tenant consultation and advisory groups with interagency representation, tenant employment & training, police liaison via crime prevention officer, aboriginal liaison officer, POP	High New street connections, dwelling upgrades and reorientation, infrastructure upgrades, community & youth centre, community garden, open space upgrades (Radburn reversal)
Housing Area 2.2 Commenced: 1998 Agencies involved: Stock reduction: Nil Housing Community housing provider Police Local Government Education & Training Health Community Justice Centrelink Regional tenants association Numerous private agencies	High On-site community housing management in selected areas, flexible allocation strategies, interagency meetings, integrated whole-of-government service provision, tenant participation and consultation, employment and training initiatives, social enterprise development, food coop, community social events, various social and mutual interest groups, youth drop in and computer centre, youth activities, play groups, problem oriented policing, two crime prevention officers with CPTED training, community policing and mobile van accompanied by local cultural elders, hot spot analysis and targeting, culturally specific crime prevention strategies, security awareness education,	Low Street cleanups, improved maintenance response, community gardens, target hardening, repair vandalism damage.
Housing Area 2.3 Commenced: N/A Stock reductions: Few Agencies involved: Housing Police	Moderate Tenant group in one area, police liaison with community groups, safety audit, housing- police exchange of information, inter-agency safety committee	Low Some property sales, tree and shrub pruning
STATE 3		
Housing Area 3.1 Commenced: 1998 Stock reduction: 5% Agencies involved: Premiers Dept Housing	High Multi-agency liaison group, tenant participation on steering committees, community workshops, employment and training projects, community	High Public domain improvements (parks, streets, pathways, traffic controls, lighting), public housing upgrades (internal and external), security upgrades, sales of stock to

 Police Education Health Juvenile Justice Local government 	festivals, family support project, community bus service, domestic violence worker, community arts & crafts projects, youth drug & alcohol prevention/early intervention, community capacity building worker and program, community enterprise education, indigenous community centre, community radio/training program, sport & recreation officer, school based enterprise education, active neighbourhood watch, problem oriented policing, community crime and safety education, community safety strategy, legal advice centre, police 'open door' general policy to engage with multi-cultural groups.	tenants, public transport infrastructure upgrade, indigenous community centre
Housing Area 3.2 Commenced: 1998 Stock reduction: 2% Agencies involved: Premiers Dept Housing Police Education Health Juvenile Justice Local Government	High Multi agency liaison group, tenant participation, community reference group, community renewal workshops, community festivals, youth and community arts & crafts projects, community bus service, school based enterprise education, various employment and training projects, family support project, youth drug and alcohol prevention and early intervention, domestic violence worker, active neighbourhood watch, on-site community policing centre, local police beat, juvenile justice project for youth at risk, sport and recreation worker,	Low Park upgrade, some sales of public housing stock
Housing Area 3.3 Commenced: N/A Stock reduction: N/A Agencies involved: Housing Police Local Government	Low Tenant groups, monthly interagency meetings, place management group, community police advisory service for liaison with community, community crime prevention education	Low Public housing sales, public housing upgrades, accommodation for the elderly, police community youth centre (recent).