

Prospects for the Rural-Urban Fringe in Australia: Observations from a Brief History of the Landscapes around Sydney and Adelaide

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Abstract

Despite being a major site of recent population growth and, arguably, a key arena for sustainability concerns, the rural-urban fringe has received relatively little attention in the literature concerning Australian cities and urban policy. To address this shortcoming the authors review post-World War II efforts to plan the rural-urban fringes of Sydney and Adelaide and find a number of issues for contemporary policy-makers. First, the fringe is becoming increasingly complex due to multi-faceted demographic change, a broadening economic base and demands for better environmental management, all within the context of an evolving understanding of sustainability. Second, water resource management, partly under the auspices of integrated natural resource management, is assuming a much higher priority than in early fringe planning endeavours, which emphasised urban containment, agricultural land protection and landscape conservation. Third, and partly as a consequence of this shift of priorities, there is also evidence of changes to the nature and focus of policy tools used in the fringe, with land management concerns now cutting across traditional land use planning. Finally, and fundamentally, these observations raise questions about how future governance of the fringe should be organised. Together these four themes pose an enthralling series of challenges for policy-makers for which much more research and discussion are needed.

KEY WORDS *rural-urban fringe; land use planning; land management; integrated natural resource management; sustainability; Sydney; Adelaide*

ACRONYMS

DEP	Department of Environment and Planning (South Australia)
DUAP	Department of Urban Affairs and Planning (New South Wales)
GIS	Geographical Information Systems
OMPA	Outer Metropolitan Planning Area (South Australia)
REP	Regional Environmental Plan (New South Wales)
SEPP	State Environmental Planning Policy (New South Wales)
SPA	State Planning Authority (New South Wales and South Australia)

Introduction

One of the most distinctive features of Australian urbanisation, like that of North America, is the rural-urban fringe (hereafter 'the fringe' or 'ex-urban' region) that surrounds the major cities and larger provincial centres. This was highlighted in the 1996 study *Beyond the Suburbs*, produced by the then Bureau of Immigration, Multicultural and Population Research. This report described how the fringe is now a major location of population growth nationally. It also revealed that the size of ex-urban Australia, though not on the same scale as North America, is probably greater than widely understood, extending up to 100 km around the mainland capital cities (McKenzie, 1996). Figure 1 shows the fringe for Sydney and Figure 2 that for Adelaide as defined by McKenzie in 1996. Both are subdivided into inner and outer components similar to the 'edge' and 'periphery' identified by Audirac (1999) and Bunker and Holloway (2001). The definition of the extent of the fringe can vary with the criteria used, but the amount of commuting to the central metropolis is a common measure used in part by McKenzie.

The fringe around Australian cities is subject to a degree of planning control that is uncommon in North America, and there are observed differences in the scale and nature of the fringe phenomenon (Burnley and Murphy, 1995a). Nevertheless, there are considerable similarities too, as evident from recent reviews by Daniels (1999), Furuseth and Lapping (1999) and Friedberger (2000). They show that the North American fringe is widely drawn around the larger cities; that it is an area of strong, low-density, car-based residential development of various kinds, mixed with rural activities and newer, urban-related land uses; and that it is subject to frequent land use conflict arising from this mix of uses and expectations. Market forces rather than regulation have shaped its character, most notably in States like Texas (Friedberger, 2000), although it is possible to trace a long-standing, albeit minority recognition of the need to control ex-urban development (Lehman, 1995; Daniels, 1999). Oregon stands out in this regard for its strong intervention in the interests of

metropolitan planning and natural resource management (Knapp and Nelson, 1992).

In contrast, the European fringe has much less in common with Australia. This is due partly to its older, more compact cities and higher population densities (Alterman, 1997), and partly to different perceptions of and political responses to the countryside, resource scarcity and food security (Bunce, 1994). However, early post-World War II (hereafter 'post-war') planning in Australia was heavily influenced by British practice, which amongst other things was concerned with the containment of large cities through establishment of greenbelts and satellite towns (Hall *et al.*, 1973). Containment policy owed much to the strong aesthetic and heritage values invested in the English countryside (Bunce, 1994), but was also influenced by food rationing in World War II and the subsequent consensus on the need to conserve farming land. This policy is now being dismantled because of the impact of the European Union's Common Agricultural Policy and population growth in the prosperous and dynamic south-east of England (Breheny and Hall, 1996; Newby, 1996; Winterbottom, 2002). Nevertheless, it has had an important impact on Australian planning for the fringe, evident in an openness to land use regulation and the adoption of actual planning controls that is more British than North American in character.

Accordingly, Australia's fringe shares similarities of form with that of North America and policy legacies from Britain. But what are the more particular characteristics and dynamics of the Australian fringe? We start with a few general observations.

Besides strong population growth over the past three decades, the Australian fringe is also characterised by the presence of natural resources that are either strategically important (e.g., metropolitan water supplies), threatened (e.g., remnant native bushland and fauna habitat) or scarce (e.g., 'prime' agricultural land), as well as fiercely contested heritage, landscape, and environmental amenity values. Indeed, notwithstanding evidence of a recent slowing of the growth rate (ABS, 2002), the population pattern

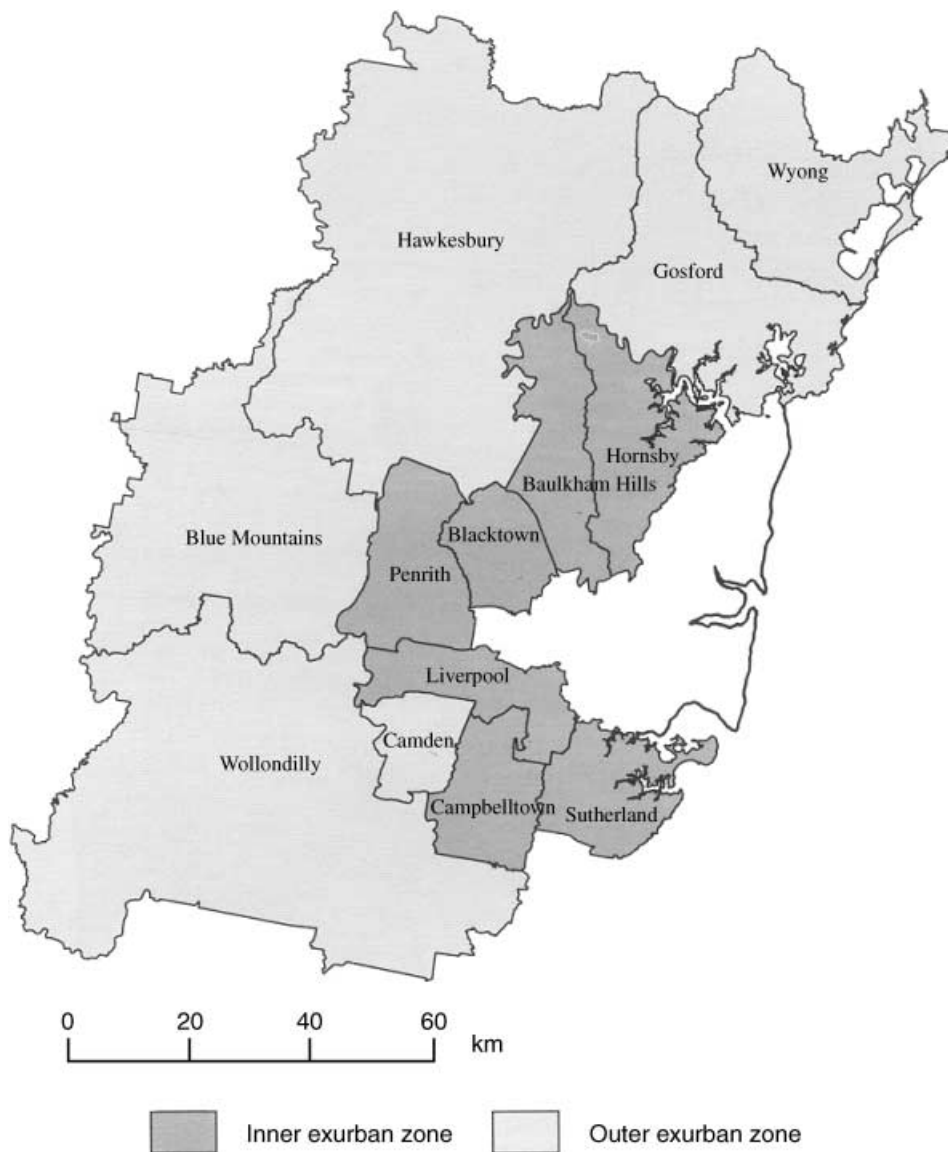


Figure 1 The rural-urban fringe of Sydney (Source: McKenzie, 1996, 7).

that constitutes the fringe is strongly concentrated in Australia's most environmentally favourable regions (Hugo, 1989; Houston, 2003). As acknowledged in a National Population

Council (1992) report a decade ago, this spatial convergence of population growth and key resources poses a series of major public policy challenges.



Figure 2 The rural-urban fringe of Adelaide (Source: McKenzie, 1996, 10).

Viewed in this way the fringe is a complex arena where a range of public policy issues related to population growth, urban development, environmental protection and natural resource management intersect. For example, Bunker and Holloway (2001) identified concerns in Sydney's fringe relating to water harvesting, deteriorating air quality, pressure on land for intensive agriculture, management of bushland and remnant vegetation, protection of areas of landscape and heritage significance, and accommodation of extractive industries and solid waste disposal. It might even be argued that the fringe is subject to the sustainability agendas of both urban and rural Australia.

However, even this assessment understates circumstances in the fringe. The strategic significance implicit in the National Population Council (1992) report is complicated by the fringe's inherent dynamism. This is evident not only in the way '... the expanding city constantly absorbs its fringe area and creates a "new" fringe further from the city centre' (Golledge, 1960, 243), but also in the evolving range of functions and activities that are located within it. These include varying combinations of living and farming (Menzies and Bell, 1981), new forms of intensive agriculture (Johnson *et al.*, 1998), and businesses catering for tourists and visitors (Tonts and Greive, 2002). Moreover, the population growth occurring there is as differentiated as it is strong. Ford (1999) and Fisher (2003) have identified four distinct growth processes around Adelaide, while Bunker and Holloway (2001) have commented upon the multiple housing markets that exist in Sydney's fringe. Clearly the Australian fringe is now a very complex and challenging policy arena.

Despite these circumstances the rural-urban fringe has received relatively little attention in recent literature concerning Australian cities and urban policy (e.g., Davison and Fincher, 1998; Hamnett and Freestone, 2000). Contemporary understanding of the fringe in Australia relies, instead, on the insights of researchers investigating demographic trends (Murphy and Burnley, 1993; Burnley and Murphy, 1995a;

1995b; McKenzie, 1996; Ford, 1997; 1999; 2001; Fisher, 2003), rural production (ARRPN, 1994; Johnson *et al.*, 1998; Henderson and Epps, 2001) and water resource management (Farrier *et al.*, 1998; Healthy Rivers Commission, 1998; CSIRO Department of Land and Water, 1999). Only McKenzie (1996; 1997) has attempted to address directly the relationship between the fringe and metropolitan planning policy.

This uneven body of scholarship and research is remarkable because the need for a better understanding of the public policy dimensions of the Australian fringe is now clearly apparent and urgent. Around the country, the form and character of the fringe is a legacy of planning ideas and policy instruments introduced over the past 50 years (Bunker, 2002). Many of the original ideas and instruments remain operational, or at least influential, and firmly embedded in the public consciousness. However, they are continually being joined by new imperatives associated with the urban and rural sustainability agendas referred to above, and with other contemporary themes of government (e.g., water reform, regional development and competition policy).

One consequence of this crowded policy space is that getting consensus even on broad policy directions for the fringe, let alone on the implementation of actual initiatives, appears increasingly difficult. Given the burgeoning demands on plan-making, decision-making and policy formulation in the fringe, there is a need to reconsider both its significance in contemporary circumstances, and the relevance of past policies to those circumstances. Understanding this is likely to be easier if we can first make sense of the fringe historically.

Accordingly, the aim of this article is to provide some perspective on where the fringe has come from, as a prelude to considering where it might now be going. Our methodology is by way of tracing the evolution of planning and policy for the fringes of Sydney and Adelaide since World War II. We do this primarily by reference to the key plans and strategies that have influenced the fringe of both cities in the post-war period, up to the present day.

As may become apparent, this is not a straightforward task. Besides the ambiguous locus of responsibility for fringe planning, sitting somewhere between State and local government, few of these documents have been prepared with the entire fringe as a deliberate and conscious focus of policy. Usually it has been addressed in a partial, indirect or *de facto* way and, as a consequence, the influence of these plans and strategies has to be inferred. Furthermore, changing circumstances and priorities outside the land use planning arena, most notably those in relation to water resource management and use, mean we increasingly have to take account of legislation and policy in other sectors.

The selection of Sydney and Adelaide is partly for reasons of practicality, and partly because they provide sufficient contrast to test for difference and similarity. By examining these two cases in tandem we hope to uncover and understand the main issues that have informed perceptions and policies about the rural-urban fringe in Australia. From this analysis we distil a number of themes related to the nature of the contemporary fringe, and the policy challenges that exist. We emphasise that what follows should be read as a preliminary sketch rather than a finished work.

Planning for Sydney's fringe 1945–2002

Figure 3, taken from the publication, *Prelude to a Plan* (SPA of NSW, 1967), shows Sydney and its rural surrounds, along with the urban areas developed at that time. Remarkably, the outer boundary is the same as that used by McKenzie (1996), as shown in Figure 1. The landscape of the fringe is formed into broad physiographic provinces, mainly of encircling sandstone uplands shown as 'rough land' in the figure and rising in height with increasing distance from Sydney. The most familiar of these are the Blue Mountains to the west. The easiest route inland lies to the south-west through the Southern Highlands to Goulburn and Canberra. Within this outer ring, forming the periphery of the rural-urban fringe, lies the Cumberland Plain,

occupied mainly by Sydney, with its suburban growth intruding into the inner edge of the fringe (Bunker and Holloway, 2001).

Post-war vision and the control of sprawl, 1945–1960

The County of Cumberland Planning Scheme prepared in 1948 by the Cumberland County Council — a body representative of local government authorities in the Sydney region — was the first of Australia's post-war metropolitan plans. As such it reflected the reforming idealism of post-war reconstruction, took a sidelong glance at the Greater London Plan of 1944, and used modest estimates of population growth. At the time, both Sydney and its surrounding countryside were seen as diminished and blighted by uncontrolled development — processes of 'promiscuous urbanisation' that scattered premature subdivisions and unserviced lots among abandoned farmland far ahead of the frontiers of suburban growth.

In response, a green belt was thrown around Sydney to contain and define the slowing sprawl of the city. It was to be beautified, '... subject to special aesthetic treatment and protection of its rural character' (County of Cumberland, 1948, 129), and contained recreational and scenic reserves. Further out, encircling the green belt, there was a rural zone to be used for farming to provide fresh food for the metropolis, afforestation and water harvesting. Settlement in the zone was to be encouraged in selected towns so that a fuller range of services, opportunities and employment would be made available, and migration to the city would no longer be so necessary or attractive. In this way, it was argued, the rural-urban fringe had the primary function in trying '... to regain an earlier harmony between city and country' (County of Cumberland, 1948, 124).

The Scheme became law in 1951. Suburban growth was organised into broad precincts, which the green belt defined and contained, and farming areas were protected from speculative subdivision by the imposition of a minimum subdivision size of five acres. This interesting

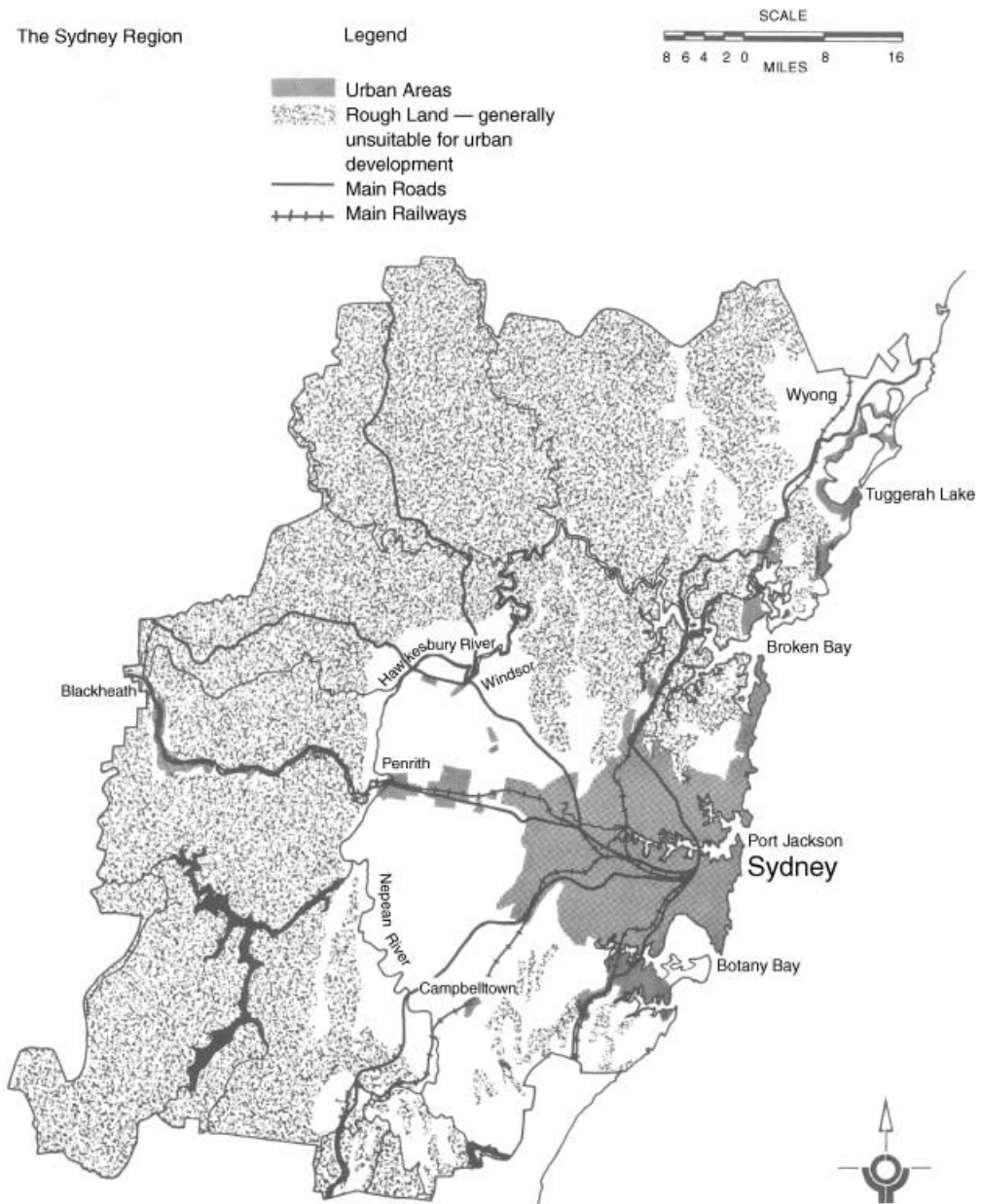


Figure 3 Sydney and its rural surrounds (Source: State Planning Authority of New South Wales, 1967, 8).

standard, perhaps the precursor to contemporary rural subdivision controls, arose following a survey of farming around Sydney in which it was established that two-and-a-half acres could then support an intensive activity such as cut-flower growing or irrigated horticulture. However, as a precaution, and in a manner that foreshadowed subsequent arbitrariness in these matters, the minimum subdivision size was doubled to five acres (Bunker, 2002).

A Cumberland County Council report of 1957 provided more details on the purposes of the Green Belt and Rural Zone. Specifically, they were to:

- a) contain the city to a planned population and to prevent its outward growth;
- b) provide a belt of countryside between the city and rural towns of the county;
- c) provide an escape from urban living with spiritual, mental and physical relaxation;
- d) provide for rural pursuits close to the city;
- e) provide for institutions which require a rural site;
- f) provide for major Open Space Reserves;
- g) provide for a unified area around the city which can be planned countryside, providing for husbandry of the land, desirable standards of living, working and playing, and maintenance of beauty, character and tradition (quoted in Golledge, 1960, 253–254).

This gives short shrift to agriculture, which could reflect the fact that ‘much of the green belt was open grassland and rough timber with little economic viability for agricultural use’ (Freestone, 1992, 73). More likely it reflected the preoccupation of the planners with containing and shaping urban development as suggested in (a) above so that the protection of agricultural land became a *de facto* policy tool for urban planners. Certainly, later planners and geographers attempted to redress this imbalance by advocacy and by conducting research that highlighted the importance of agricultural land in providing for Sydney’s food requirements (Winston, 1957; Rutherford, 1966; Rutherford *et al.*, 1971).

By the 1960s, population growth and urban expansion had accelerated. The green belt was dismantled, the Cumberland County Council abolished and vision was replaced by pragmatism. But promiscuous urbanisation had been controlled. One comment was that an ‘artificial severance of the urban rural continuum is taking place just as if a wall was being built round the city to contain urban development’ (Golledge, 1960, 254). It would be more correct to say that a moving boundary to urban expansion had been established to fill up developing suburbs until rezoning took place. Inevitably speculation in land continued but scattered and leap-frogging development had finished.

The long boom 1960–1980: pragmatism, systems thinking and urban management

The next consolidated planning statement for Sydney was the Sydney Region Outline Plan of 1968 (SPA of NSW, 1968). In comparison with the County of Cumberland Plan it was ‘much less concerned with land use detail, and more with the overall form or structure of the metropolitan area’ (Alexander, 1986, 118). It dealt with the processes of managing headlong suburban growth accompanying the long boom from the late 1950s to the late 1970s. In this new context, the rural-urban fringe was seen as a residual space within which the extension of the physical edge and the expansion of the wider influence of the metropolitan area would take place. While this space was constrained by such factors as national parks, water harvesting requirements and steep slopes, the planning approach was very much that of accommodating the extension of suburban Sydney, and the recreational needs of its residents. There was little interest in the farming produce of the fringe and much rural land was zoned ‘non-urban’. One history of Sydney planning used the ironic chapter heading ‘Promiscuous Suburbanisation: The Sydney Region Outline Plan.’ (Spearritt and DeMarco, 1988, 23).

The Outline Plan also represented an evolution in the planning approach from visionary proposals couched in terms of broad land use

arrangements to pragmatic measures to manage the systems of a city, particularly in terms of releasing land at the fringe in tandem with the coordination of services to accommodate and shape urban growth. Although the authors of the Outline Plan appear to have found planning theory of little use to them in its preparation (Cardew, 1998) it does exhibit elements of a systems approach to planning (McLoughlin, 1969) as well as employing instruments of urban management in its staged sequences of land release (Mant, 1988). The Outline Plan organised a wave of suburban expansion around communications and other infrastructure systems (Royal Australian Planning Institute Journal, 1968).

Neo-liberalism, ecologically sustainable development, compact cities and pluralistic planning: 1989 to present

Since the long boom ended in the 1970s, dramatic changes have taken place in the political economy of Australia and in the style and content of spatial planning (Gleeson and Low, 2000). There have been four metropolitan plans for Sydney in the last two decades, with increasing engagement with economic, social and environmental issues, and less specificity about arrangements on the ground. As one commentator put it '[s]ince the 1970s metropolitan strategies have been increasingly de-spatialised and process-oriented, stressing guidelines and performance targets rather than static outcomes like the 1948 blueprint' (Freestone, 2000, 129). However, one strong initiative has been to try and limit outwards expansion of the city by development and redevelopment processes which raise residential densities under the rubric of urban consolidation (Holliday and Norton, 1995; Holliday, 2000). The drive for a higher-density, compact city has been endorsed as government policy by a Premier clearly concerned by the continuing growth of Sydney and its associated environmental problems (Totaro and Nicholls, 2002). There is also a re-emerging concern with the importance of the farming production located in the fringe, most of which is related directly to Sydney, either as a market or as a

gateway to the outside world (New South Wales Agriculture, 1998; Sinclair, 1999; Verity 2003).

Over the years, the growth of Sydney, Newcastle and Wollongong and increased mobility and communication have effectively merged their urban development and associated fringes into one field. This theme was sounded as early as the Sydney Region Outline Plan, which set its proposals within that wider context (SPA of NSW, 1967). One consequence of this concentration of population and resources is that much State-wide legislation has particular import and effect in that region. A prime example is that of water management and use. A national program of water reform is represented in the radical State-wide *Water Management Act 2000*. But the importance of safeguarding the quality and quantity of urban water supply has also led to other legislation for the Newcastle-Sydney-Wollongong region in the form of the *Hunter Water Act 1991*, *Sydney Water Act 1994*, and the *Sydney Water Catchment Management Act 1998*.

Table I demonstrates this feature. The left-hand column contains a list of important legislation affecting the fringe, most of it State-wide. The right-hand column lists the policy statements, derived from that body of legislation, which are directed particularly at the fringe. In these circumstances there is considerable confusion and dissatisfaction with the 'number of plans, strategies and committees and the lack of coordination between them' (DUAP, 2001, 3). This complexity has been compounded by recent scares about water quality which have necessitated additional protection for the metropolitan water supply in terms of water and land management and land use (DUAP, 2000).

In these circumstances, it could be argued we are entering a fourth stage of planning in Sydney when the transition to sustainability, in economic, social and environmental terms, becomes a dominant theme. It becomes an essential element in the continued drive for world city status, the engagement with globalisation, and the avoidance of 'Fouling the nest.' (Colman, 1991). There is already a 'green' strategic plan for Sydney (Total Environment Centre, 1999).

Table I Policy statements for the rural-urban fringe of Sydney and the legislation on which they are based.

Legislation	Policy Statements
Catchment Management Act 1989	Shaping Western Sydney 1998
Environmental Planning and Assessment Act 1979 and later amendments	Sydney REP 20 Hawkesbury-Nepean (number 2 1997) SEPP 58 Protecting Sydney's water supply 1999
Heritage Act 1977	Achieving a Hawkesbury-Nepean Floodplain Management Strategy 1998
Local Government Act 1993	REP 2 Georges River Catchment 1999
National Parks and Wildlife Act 1974	Draft REP: Sustaining the Catchments 2001
Native Vegetation Conservation Act 1997	Water Resource Policy, report to the Council of Australian Governments (COAG) 1994: agreement on water reform framework for Australia by COAG in 1995
Protection of the Environment Administration Act 1991	Greater Western Sydney Public Transport Strategy 1997
Protection of the Environment Operations Act 1997	Action for Air 1998
Sydney Water Act 1994	Strategic Plan for Sustainable Agriculture: Sydney Region 1998
Sydney Water Catchment Management Act 1998	Catchment Management Plans
Threatened Species Conservation Act 1995	Regional Waste Management Plans
Waste Minimisation and Management Act 1995	Local Environment Plans
Water Management Act 2000	

Planning for Adelaide's fringe 1962-2002

In contrast to Sydney, Adelaide's rural-urban fringe is smaller and more intimate in scale. McCaskill described part of it — the central Adelaide Hills — as having 'a European rather than an Australian texture . . .' (1979, 171). Figure 4 shows its major constituent parts and their relationship to the city, as shown in the Outer Metropolitan Development Plan of 1975. To the north it extends into the northern Adelaide Plains, which are flanked inland by the Barossa Valley. To the east it comprises the Mount Lofty Ranges, which gradually decrease in height south of Adelaide, extending into the broad undulating landforms and drainage systems of the Fleurieu Peninsula. Wedged in tightly at the northern and southern ends of the city respectively, and within the defined metropolitan area, are the Virginia market gardening district and the Willunga Basin, which encompasses the McLaren Vale wine district.

1962-1975: Designing and organising suburban growth

Planning for Adelaide after World War II had to wait for the proposals contained in the *Report on the Metropolitan Area of Adelaide* (Town Planning Committee, 1962). Moreover, this document only became an authorised Development Plan in 1967, following the passage of the *Planning and Development Act*. As a consequence, however, its authors were able to draw lessons from the metropolitan plans prepared for several other cities. This is evident in the way the Adelaide plan reflected a compromise between the United Kingdom-inspired ideas of the Sydney plan, and the pragmatism of the plans for Melbourne and Perth (Bunker, 2002).

Echoing Sydney's green belt, a Hills Face Zone was defined to give a clear and distinct eastern edge to the city. The zone extended almost 100 kilometres north to south, comprising the west-facing escarpment of the Ranges, which forms a backdrop to the metropolitan

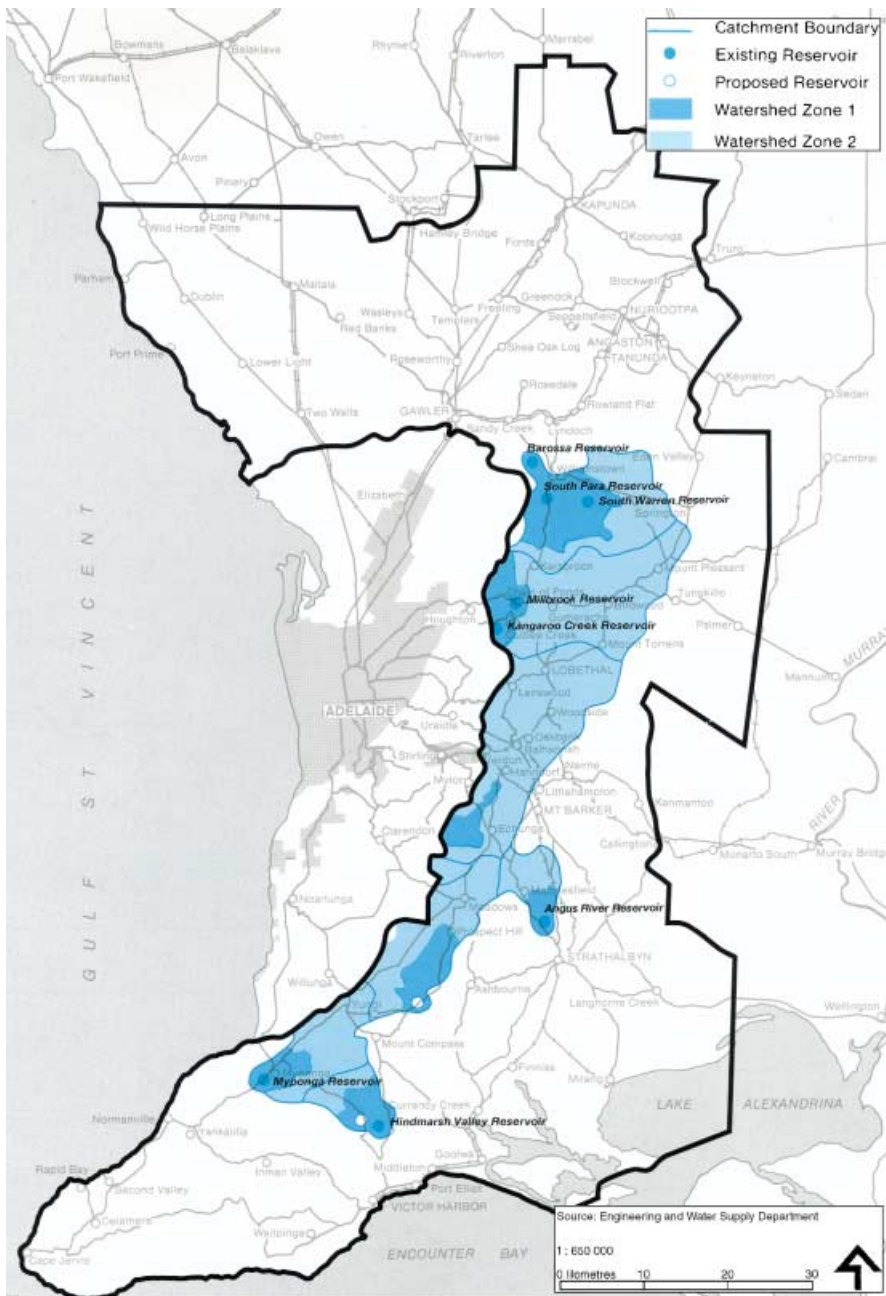


Figure 4 The outer metropolitan planning area of Adelaide, including catchment areas (Source: State Planning Authority of South Australia, 1975, facing page 42).

area. Policy for the zone required that 'the minimum size of allotment . . . [be] . . . 10 acres [ca. 4 ha], with a minimum frontage of 300 feet [ca. 90 m] . . . [and that] . . . uses of land permitted in the zone would be those which would not impair the natural character of the face of the Ranges' (Town Planning Committee, 1962, 284-285).

As well as the Hills Face Zone, a somewhat larger Rural Zone was established immediately behind it to the east, and to the north of the city where high intensity market gardening is still prominent. Subdivision and development controls were similar to those for the Hills Face Zone, although local councils rather than the State Planning Authority (SPA) administered these, and did so with considerable discretionary powers (Town Planning Committee, 1962, 289-290). Two statements about this Rural Zone from the Report reveal something of the Town Planning Committee's thinking in relation to Adelaide's rural-urban fringe at this time.

First, it was intended that the Rural Zone be used 'primarily for agricultural purposes until the subsequent expansion of the metropolitan area requires that the land be used for urban development' (Town Planning Committee, 1962, 285). This suggests a departure from the heroic objectives in the 1948 Sydney plan. Second, the Committee believed that '[d]efining land for rural purposes . . . [in this way] . . . will assist in a more intensive use of the land for food production, prevent land speculation and the uneconomic spread of the metropolitan area' (Town Planning Committee, 1962, 285). This reveals again, but rather more explicitly than in Sydney's 1948 plan, the planners' intention to use the theme of agricultural land protection as a *de facto* urban planning tool in the rural-urban fringe.

Perhaps the most remarkable feature of the 1962 Report, however, is not in the text, but on the plan itself. In contrast to Sydney's 1948 plan, which encompassed the bulk of its rural-urban fringe, Adelaide's plan included only the inner edge of its fringe. Other than a statement that 'the open and rural character of the Mount Lofty Ranges adjoining the metropolitan area should be retained permanently' (Town Plan-

ning Committee, 1962, 279), there was no reference to parts of the rural-urban fringe beyond the statutorily defined metropolitan area.

1975-1985: Recognition for the fringe

Where the proposals of the 1962 Report addressed only the inner edge of the fringe, the 1975 Outer Metropolitan Planning Area (OMPA) Plan encompassed most of what is now regarded as Adelaide's ex-urban region (McKenzie, 1996; Ford, 1997). Furthermore, by comparison with the earlier plan, this one was multi-dimensional in its scope. Once again protection of landscapes and natural areas figured prominently, but there were important new provisions for water conservation and the containment of country townships, as well as expanded provisions to protect rural land from further fragmentation.

The latter were based on a recognition of the growing demand for rural residential and hobby farming opportunities, and concerns that this form of development would lead to property neglect, undermine conditions for *bona fide* farmers, and ultimately cause greater dependence by primary production on more remote, poorer quality land. The OMPA Plan addressed these concerns by setting out conditions in which further subdivision of rural land would be acceptable (South Australian State Planning Authority, 1975, 65-67). At the heart of these conditions was the contentious notion of an 'economic farm unit'. Following a tortuous process of negotiation and legal challenge, this standard was set rather arbitrarily at 40 hectares.

Besides concerns about rural land and agriculture, the feature of the OMPA region that most clearly defines its relationship with the metropolitan area is its role in relation to water supply. The Mount Lofty Ranges, which form the bulk of Adelaide's rural-urban fringe, provide a large proportion of Adelaide's water supply in average rainfall years. This is despite the fact that 'most of the potential water catchment land was alienated to farming and much of it had been closely settled within the first two decades of the establishment of the colony' (McCaskill, 1979, 171). The water quality

problems that arose out of this situation were untenable by the early 1970s (McCaskill, 1979, 174), so the OMPA Plan introduced zoning of the water catchment areas surrounding existing and proposed reservoirs as shown in Figure 4.

Two zones — Watershed Zone 1 and 2 — were identified according to pollution risk, with development controls in each differentiated according to the severity of that risk. The controls applied mainly to primary production activities, especially intensive animal keeping, but included more stringent controls on subdivision of rural land than applied outside the catchments. Growth boundaries were also defined for towns within the catchments to ensure sewerage connections for any future urban development.

1985–1995: New issues, technologies and techniques drive planning for the fringe

Some of the impetus for the next period of planning initiatives in Adelaide's fringe can be traced to the disastrous Ash Wednesday bushfires of 1983. Using emerging GIS technology, the Department of Environment and Planning (DEP), successor to the SPA, mapped bushfire hazard across the Mount Lofty Ranges region and began work on accompanying planning policies. Other long-standing issues in the Ranges, including water harvesting and extractive industry, were given similar treatment and, before long, there was a suite of sectoral issues under consideration by the DEP, with their respective State government agencies queuing up to be involved. The upshot of all this interest was the commencement of the Mount Lofty Ranges Review in 1987.

The Review aimed to establish a comprehensive database that would enable extensive public consultation and assist formulation of a regional strategy capable of resolving fundamental land use conflicts (Cooper, 1986). One important theme, continuing the earlier priorities, was the relationship of the region to the metropolitan area: a study of long-term development options for Metropolitan Adelaide had been running since 1985. Other predictable sectoral issues on the agenda included water catchment protection,

township and rural living development, regional transport, bushfire protection, extractive industry, agricultural land use conflict, tourism, and environmental protection (Cooper, 1986).

After a series of draft consultative plans, management plans and strategy plans, the Review came to a conclusion of sorts in 1993 with the release of the *Mount Lofty Ranges Regional Strategy Plan* (Department of Housing and Urban Development, 1993). The Strategy Plan, which remains the basis of planning policy for the region today, emphasised the protection, management and enhancement of the region's water resources, primary production, and natural and cultural characteristics. In an effort to finally exert some control over development pressures it also adopted a controversial policy approach that made most forms of development outside townships prohibited. This was intended to be a temporary measure but its roll-back has only recently commenced and it remains a source of discontent in the region.

The full story of this exercise and its contribution to fringe planning around Adelaide is too long and complex to be recounted in full here. However, a number of key themes deserve mention. First, the advent of GIS technology inspired a strong 'neo-McHargian' flavour to the Review and to many subsequent planning endeavours for Adelaide's fringe. This emphasis on a rational, information-driven, regional planning process also made possible the second theme, namely, the enthusiastic adoption of land capability analysis as a guiding principle for policy. From this point forward the planning process started to concern itself not just with land use, but also with land management.

Third, as a result of the Review, planning for Adelaide's fringe was not only multi-dimensional in character; it became a distinctly multi-agency affair with State government agencies keen to see that their sectoral concerns and constituencies were being addressed. This led to a 'bargaining' style of policy formulation and levels of complexity that would not have been imagined in 1962. Fourth, the Review precipitated an era of experimental planning

policy. Besides the use of land capability analysis to assist land allocation decisions, a version of transferable development rights was trialed in an effort to break through some of the intractable problems of the region (Evans, 1993).

1995 to present: Complexity, confusion, crisis

Like New South Wales, the South Australian Government has launched a number of initiatives in recent years that broaden or augment the planning system's focus, linking it to natural resource management and environmental protection. Some have been state-wide initiatives with indirect consequences for the fringe. These include *Development in Rural Areas*, a publication intended to promote performance-based planning for rural land uses (Planning SA, 2001), and the *Water Resources Act 1997*, which has sought to create linkages to the *Development Act 1992* and, in the process, promote improved land management (Moseley, 1999). Other initiatives have directly addressed long-standing fringe issues. These include the establishment of the Mount Lofty Ranges Catchment Centre and the re-introduction of Small Farms Advisers, to better integrate rural production, land management, and water harvesting and use.

This continues the trend of the previous period, in which planning in the fringe became a more multi-dimensional and technically-oriented process, with land management concerns cutting across those of traditional land use planning. However, there is evidence that the logistics and complexity of this trend may be outweighing its benefits, creating a 'log-jam' of sectoral agendas and concerns. The current situation is illustrated by efforts to review the Mount Lofty Ranges Regional Strategy Plan.

The review was commenced in early 1997 and sought to update the Plan and bring it into the format of the more recent Metropolitan and Country sections of the Planning Strategy. Like the original Mount Lofty Ranges Review, a multi-agency process was established for this task, and local government and communities consulted closely. However, several years on,

and despite the efforts of an executive level task-force along the way (Cabinet Office, 1999), the review process has apparently stalled, with perennial issues in the region, such as the relative priorities given to agriculture, water harvesting and emerging industries such as tourism, remaining contentious.

Failure to make progress on the strategic front has arguably led to deteriorating conditions at the local level. Agricultural land use conflict in the Mount Lofty Ranges became a sufficiently contentious issue by the late 1990s for the then Premier to establish a Round Table to consider and respond to the problems of peri-urban agriculture. The State Labor government, elected in 2002, has moved to continue this forum but any progress with this initiative is likely to require prior resolution of some fundamental questions about agriculture's place in the fringe.

Discussion

This article began by suggesting that the rural-urban fringe is now an important arena for a range of public policy concerns in Australia: arguably even a key arena for sustainability. It went on to note that the various layers of expectation prevailing upon the fringe also pose serious difficulties for policy-makers. Our brief recapitulation of the history of planning for the fringes of Sydney and Adelaide reveals a number of persistent issues and raises some new ones. On this basis we identify four related themes that seem relevant to any contemporary attempts to manage and plan the rural-urban fringe of both cities.

These themes would need further examination to see how far they could be generalised into Australia-wide characteristics, but we suspect they would not require a great deal of modification in that regard. It should also be acknowledged that our selected themes largely ignore traditional planning questions about where and how to accommodate further population growth and urban development in the fringe. These are doubtless important questions requiring careful consideration, but our attention here has fallen instead on a set of themes more concerned

with new and unfolding challenges than with traditional ones.

First, it is clear that the task of planning for the fringe has become considerably more complex and difficult over the years. Where the early plans for the fringe of both cities, but especially Sydney, simply sought a degree of urban containment, and to preserve a sense of the rural ideal, fringe regions around the nation are now the site of significant demographic change and economic restructuring (Maher and Stimson, 1994). This trend was originally driven by the commodification of rural amenity and the rural residential phenomenon, and to a large extent still is (Tonts and Greive, 2002). Latterly, however, it has also been linked to the renaissance of some traditional rural industries, principally winegrapes, the emergence of some new ones, such as olives and farm-based tourism (Langworthy and Hackett, 2000), and the relocation of some formerly metropolitan-based businesses and industries (McKenzie, 1996).

This broadening social and economic base is matched by an equally pressing concern for better management of natural resources, especially water, and environmental protection. Significantly, the constituencies associated with these demands are either located outside the fringe, as metropolitan water consumers, or are relatively new to it, as residents seeking to enjoy and protect rural amenity. Besides posing conundrums about where and how to accommodate further population growth and new urban development, these demands also appear to stand in increasing opposition to the farming that has traditionally given the fringe its character and ready appeal. As a result, several States have experienced agricultural land use conflict and consequent calls for the so-called 'right-to-farm' in recent years (PIRSA, 1999).

By themselves these features of the fringe's contemporary political economy suggest considerable tensions and difficulties for planners. However, pressure to deal with these demands within the evolving framework of sustainability (Dovers, 2002) adds greatly to this complexity. So does the fact that agriculture in the fringe is

by no means homogeneous. While some farmers call for a 'right-to-farm', often with good cause, others are beginning to respond to market-place demands for 'clean and green' produce and associated concepts such as Environmental Management Systems (NRMMC, 2002).

In these circumstances, the visions of the 'town and country planning' era are unrealistic and simplistic, although they retain considerable rhetorical and persuasive power, especially among urban populations. This was evident in the public response to proposed policy changes to the Hills Face Zone during 1999–2000 (Hart, 2002). Likewise, the unilateral, 'systems management' methods that characterise State government agencies appear inadequate for disentangling and reconciling the competing demands of the contemporary fringe, as various authorities seem to admit (Cabinet Office, 1999; Brown, 2001; Gilmour, 2001). This task is crucial if, as advocated in Sydney's 1948 plan and Adelaide's OMPA Plan of 1975, the fringe is to benefit both town and country.

Second, and as a by-product of these new demands, there has been an apparent re-ordering of priorities over the period of our review. While the themes of agriculture, landscape protection and urban containment were to the fore in the early plans for Sydney and Adelaide, water resource management was seemingly absent. Now, partly in the guise of integrated natural resource management, water arguably stands as the overarching policy imperative in the fringe.

Early fringe planning endeavours around both cities paid little attention to water catchments. In the case of Sydney much of this critical land was simply acquired by the water supply authority and removed from active use. The Cumberland County Plan had little to say about water. Around Adelaide the protection of the water supply by zoning around reservoirs only commenced in the mid-1970s, by which time the catchment had a very mixed-use nature. Correspondingly, and in both cases, the land resource and practices farming were given scant consideration, and agricultural land protection, to the extent it was practised, was used as a surrogate for shaping metropolitan development.

Over the years these measures have come to be recognised as inadequate and insufficient for the water resource needs of both cities. Sydney's experience with *cryptosporidium* and *giardia* contamination in 1998, despite its closed catchment, and Adelaide's well-known water quality problems and ongoing reliance on the already troubled River Murray, provide ample evidence of this. In response, and mindful that the fundamental features of both catchments cannot be changed, the emphasis in water catchment policy appears to have shifted towards the notion that farming, land management and water use need to be better integrated. This is especially evident in the Adelaide fringe.

Of course the idea of integrated natural resource management, or something like it, is in no way peculiar to the fringe or novel. It is ubiquitous across the entire Australian landscape and has been evolving over a number of years under names like Total Catchment Management and Landcare. However, persistent concerns about the quality and uncertain supply of water coming from or through these catchments, and the evident shortcomings of existing arrangements, give it special significance and relevance in fringe settings. The fact that it also holds promise for dealing with some of the other land management and environmental protection problems of the fringe, such as weed eradication and agricultural land use conflict, only adds to its attraction.

The full implications of these apparently changing priorities and new emphases have yet to be worked out but can be anticipated. An increased priority to water resources generally is likely to have some spatial consequences for future urban development in the fringe, although these will presumably be limited to areas identified as critical to metropolitan water supply catchments. An associated shift of emphasis in water catchment policy, towards integrated natural resource management, suggests outcomes of a quite different order. These include the possibility of future limitations on farmers' harvesting of water on their properties and practical impacts for a wide range of production systems,

from intensive animal keeping to perennial tree crops and market gardening. Because integrated natural resource management is not just a policy for water catchments or the fringe, these implications will extend widely.

Inevitably there will be differences of approach resulting from the particular characteristics of both fringes. Adelaide's fine-grained landscapes, mixed-use catchment and reliance on the River Murray suggest a different range of options to those of Sydney, with its broader landscapes and closed catchment, where stricter controls have already been implemented. Policy-makers will also have to take account of concurrent efforts nationally to establish a market for the trading of water entitlements, ostensibly to promote its highest and best use, and the emerging potential for fringe agriculture to use reclaimed urban waste-water for irrigation (Major Projects Group, no date).

Where all this leaves water resource management in relation to the other policy priorities in the fringe is a moot point. The recent experience of Adelaide's Hills Face Zone and re-emerging interest in the economic value of primary production in the fringe (Houston, 2003), suggest that landscape conservation and agricultural land protection are by no means forgotten themes. Likewise, recent utterances by the NSW Premier and the proposal of an Oregon-style urban growth boundary around Adelaide (Planning SA, 2002) suggest that the urban containment theme is also alive and well. Nevertheless, our 'between the lines' reading of recent events would indicate that water is here to stay as a key variable in the fringe of both cities.

Third, we note evidence of an important change underway in statutory planning practice. This is especially so in the rural parts of the fringe where the new demands and shifting priorities described above are most evident. Traditional planning instruments, emphasising the nominal use of land and minimum allotment sizes, are being questioned, and new performance-based approaches that seek to emphasise management and actual environmental outcomes are being investigated. The former are still widely used, of

course, although the reputation of rural land division controls has been tarnished through abuse and misuse. The latter, whether in the form of codes of practice or 'performance-standards' in statutory plans, are in a formative stage but have been embraced enthusiastically, at least at the level of concept and rhetoric.

These new performance-based instruments are not limited in their application to the rural-urban fringe, neither are they necessarily being developed for use in statutory planning. For example, most codes of practice have been developed for generic agricultural activities or environmental protection purposes. Nevertheless, the fringe is where policy instruments that can address actual impacts arising from the day-to-day management of land uses like grape-growing and intensive animal keeping will be in greatest demand. Regardless of their provenance, instruments that show promise in relation to the water quality imperative, or agricultural land use conflict, or any other resource management or environmental protection issue, will be sought out.

However, the fringe is also where these new instruments will face their sternest challenges. Continuing population change and shifting constituencies, issues of scale in fringe agricultural landscapes, and the sheer complexity we have described above will put enormous technical and political demands on them. More than likely there will be some successes in the resource management and environmental protection arenas, where there is the technical capacity for dealing with concepts like environmental performance. But it remains to be seen whether performance-based planning, such as that proposed in South Australia, can move successfully from theory to practice.

So, while the range of available policy tools appears to be widening, it should not be assumed that a new era of technical sophistication in planning is imminent. Indeed, there may still be a need for blunt instruments in certain circumstances. For example, activities such as intensive animal keeping are unlikely to be welcome in water catchments in future, irrespective of the level of management and technology

employed. Furthermore, some strategic decisions about the spatial relationship of the city and the fringe may be usefully accentuated by non-negotiable 'lines in the sand', such as the proposed urban growth boundary around metropolitan Adelaide. In the end, the challenge is to work out the best combination of policy instruments for the various planning and management issues present in the fringe, regardless of prevailing policy fashions.

This leads to our fourth and final theme, namely that of governance. Planning for the fringe of both cities has taken place largely, though not exclusively, as part of metropolitan planning. Because there is no government jurisdiction that deals specifically with the cities, let alone the fringe, State government has assumed lead responsibility. However, as noted already, the unilateral, 'systems management' methods that characterise State government agencies appear inadequate for dealing with the present plurality of interests and complex dynamics of the fringe. Indeed, there is some evidence, especially in the Adelaide fringe, of strategic policy paralysis.

The so-called 'whole-of-government' approach, which seeks to integrate and consolidate the plans and policies of various spheres and agencies of government, is one apparent solution. This is the same approach used in the current review and reform of the planning system in New South Wales, which aims to 'enable the plans and policies of other agencies, which have a bearing on environmental planning, to be better connected to the planning system' (Department of Urban Affairs and Planning, 2001, 9). Similar thinking is also evident in South Australia. The Mount Lofty Ranges Review arguably set the benchmark for multi-agency participation in regional planning, and the more recent System Improvement Program (Minister for Transport and Urban Planning, 2000) has sought better integration of decision-making across planning, environmental protection and resource management.

Superficially, the 'whole-of-government' prescription seems like a sensible approach for dealing with the increasing complexity that we

have observed in the fringe. However, given the range of stakeholders and, in some cases, the apparently near intractable nature of the issues, it would be dangerous to presume that this will be sufficient. Besides government itself — and it is not at all clear that State government agencies are unanimously willing and able to follow the prescription — policy-makers must still engage creatively and effectively with a range of constituencies. This includes community and industry groups both inside and outside the fringe. In these circumstances, mere talk of ‘whole-of-government’ intentions will not guarantee the type of collaborative and consultative action required in the fringe. Nor will it help in disentangling and reconciling the competing demands present there.

Some commentators have recently advocated a more radical reshaping of the machinery of governance in the planning and environmental arenas, largely in response to the unfolding agenda of sustainability. Two such proposals aim to bring administrative responsibilities into new and more relevant focus (Gilmour, 2001), and to deploy environmental plan-making skills and experience more fully and effectively in key agencies (Brown, 2001). These more radical prescriptions for governance may hold the key to the future prospects for the rural-urban fringe in Australia.

Conclusion

This brief history of the landscapes around Sydney and Adelaide shows an evolution from simple paradigms to complex congeries of tangled issues. The complexity we have observed has a range of economic, social and environmental drivers that cannot be understood in isolation. Nevertheless, much of this complexity arises from the multiplicity of demands now bearing on the fringe, and the various endeavours — not always well organised — focussed on sustaining its natural resource base and mediating how it is used. There has been a marked reorientation from earlier perceptions of the fringe as primarily a theatre for accommodating metropolitan influence and physical expansion.

In this same context, water supply and quality has emerged, for the moment, as the most important policy consideration in the fringe, although it has by no means displaced the long-standing themes of urban containment, agriculture and landscape protection. To date, variations in approach to the water theme can be explained in terms of historical and cultural differences in emphasis between jurisdictions. However, in most States water supply and quality are linked inextricably to land use and management in the rural-urban fringe. This seems likely to lead, almost universally, to increasingly sophisticated and fine-grained policies and practices seeking to bridge the land use — land management divide.

The future of the fringe, therefore, poses an enthralling series of challenges, for which much more research and discussion are needed. For example, emerging tools such as performance-based planning and codes of practice offer new possibilities, but it is apparent that traditional mechanisms, such as zoning and subdivision control, still need to be part of the equation. The challenge is to discover how to use these new and old policy instruments in combination, and how that combination might need to be varied to suit different localities and circumstances.

Likewise, strong community participation remains essential, but needs to be accompanied by a clearer articulation by government of its emphases and priorities, and more adequate accounting for the full social and economic implications of key policy drivers. The shift in emphasis we anticipate towards water supply and quality in the Australian fringe is a case in point. Besides changes to policies and practices that will directly address those themes, this goal is likely to require a range of supporting initiatives to modify, ameliorate, endorse or accentuate its impacts on the affected communities and landscapes. This will necessitate integrated packages of support measures addressing local economic development, farming operations, water resource management and harvesting, as in the series of programs funded by New York City for its catchment areas in

the north of that State (Pfeffer and Wagenet, 1999).

Collectively, these observations would seem to confirm the rural-urban fringe as a critical arena for sustainability concerns in Australia, and in need of fresh policy ideas. This argument is made stronger by the fact that it is not only our view or the view of planners. Suzanne Falkiner, consolidating and commenting about writers' perspectives on the Australian landscape, has volunteered that:

there has also been demonstrated a lack of equilibrium between the built environment and the natural landscape in the areas where the two intersected, with the area of intersection often depicted as a zone of desolation. Now . . . Australian cities are also beginning to show signs of exhausting their own infrastructures, and the natural resources on which they rely for their continuation. (Falkiner 1992, 235).

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REFERENCES

- ABS, 2002: *Regional Population Growth — Australia and New Zealand, 2000–01*. Bulletin 3218.0. Australian Bureau of Statistics, Canberra.
- Alexander, I., 1986: Land use and transport planning in Australian cities: capital takes all. In McLoughlin, J.B. and Huxley, M. (eds) *Urban Planning in Australia: Critical Readings*. Longman Cheshire, Melbourne, 113–130.
- Alterman, R., 1997: The challenge of farmland preservation: lessons from a six-nation comparison. *Journal of the American Planning Association* 63, 220–243.
- ARRPN, 1994: *Retention of Prime Agricultural Land and Rural Industries on the Urban-rural Fringe*. Australian Rural and Regional Planning Network, C/- TBA Planners, Bendigo.
- Audirac, I., 1999: Unsettled views about the fringe: rural-urban or urban-rural frontiers? In Furuseth, O. and Lapping, M. (eds) *Contested Countryside: the Rural Urban Fringe in North America*. Ashgate Publishing, Aldershot, UK, 7–32.
- Breheny, M. and Hall, P., 1996: Four million households — where will they go? *Town and Country Planning* 65, 39–41.
- Brown V., 2001: Planners and the planet. *Australian Planner* 38, 67–73.
- Bunce, M., 1994: *The Countryside Ideal: Anglo-American Images of Landscape*. Routledge, London.
- Bunker, R., 2002: In the shadow of the city: the fringe of the Australian metropolis in the 1950s. *Planning Perspectives* 17, 61–82.
- Bunker, R. and Holloway, D., 2001: *Fringe City and Contested Countryside: Population Trends and Policy Developments around Sydney*. Urban Frontiers Program Issues Paper 6, University of Western Sydney, Campbelltown.
- Burnley, I.H. and Murphy, P.A., 1995a: Exurban development in Australia and the United States: through a glass darkly. *Journal of Planning Education and Research* 14, 245–254.
- Burnley, I.H. and Murphy, P.A., 1995b: Residential location choice in Sydney's perimetropolitan region. *Urban Geography* 16, 123–143.
- Cabinet Office, 1999: *The Mount Lofty Ranges: a Strategic Framework*. Report of the Mount Lofty Ranges Taskforce, Department of Premier and Cabinet, Adelaide.
- Cardew, R., 1998: Corridors of power: recollections of the Sydney Region Outline Plan preparation. In *20th Century Urban Planning Experience Conference Proceedings*. Faculty of the Built Environment, The University of New South Wales, Sydney, 89–94.
- Colman J., 1991: Fouling the nest. *Urban Futures* 1, 30–32.
- Cooper, M., 1986: Towards a Mount Lofty Ranges Planning Strategy. Paper presented to Adelaide Hills Land Management Committee seminar, The Colonial Inn Conference Centre, Adelaide, 24th July.
- CSIRO Department of Land and Water, 1999: *Audit of the Hydrological Catchments Managed by the Sydney Catchment Authority*. Final Report to the Minister for the Environment, New South Wales.
- County of Cumberland, 1948: *County of Cumberland Planning Scheme Report*. Cumberland County Council, Sydney.
- Daniels, T., 1999: *When City and Country Collide*. Island Press, Washington.
- Davison, G. and Fincher R., 1998: Urban studies in Australia: a road map and way ahead. *Urban Policy and Research* 16, 183–197.
- Department of Housing and Urban Development, 1993: *Mount Lofty Ranges Regional Strategy Plan*. DHUD, Adelaide.
- Department of Urban Affairs and Planning, 2000: *Sustaining the Catchments: a Draft Regional Plan for the Drinking Water Catchments of Sydney and Adjacent Regional Centres*. DUAP, Sydney.
- Department of Urban Affairs and Planning, 2001: *Plan First: Review of Plan Making in NSW*. White Paper, DUAP, Sydney.
- Dovers, S., 2002: Institutional and policy reform for sustainability: principles and prospects for Australia. In *Getting it Right: Guiding Principles for Resource Management in the 21st Century*. Symposium sponsored by the Government of South Australia, 11–12 March, 2002, Adelaide Convention Centre.

- Evans, E., 1993: Transferable title rights. *Australian Planner* 31, 29–32.
- Falkner, S., 1992: *The Writers' Landscape: Settlement*. Simon and Schuster, East Roseville.
- Farrier, D., Kelly, A.H.H., Comiro, M. and Bond, M., 1998: Integrated land and water management in New South Wales: plans, problems and possibilities. *The Australasian Journal of Natural Resources Law and Policy* 5, 153–185.
- Fisher, T., 2003: Differentiation of growth processes in the peri-urban region: an Australian case study. *Urban Studies* 40, 551–565.
- Ford, T., 1997: *Population Trends in Adelaide's Peri-urban Region*. South Australian Department for Transport, Urban Planning and the Arts and the University of Adelaide, Adelaide.
- Ford, T., 1999: Understanding population growth in the peri-urban region. *International Journal of Population Geography* 5, 297–311.
- Ford, T., 2001: The social effects of population growth in the peri-urban region: the case of Adelaide. *Journal of Population Research* 18, 40–51.
- Freestone, R., 1992: Sydney's green belt 1945–1960. *Australian Planner* 30, 70–77.
- Freestone, R., 2000: Planning Sydney: historical trajectories and contemporary debates. In Connell, J. (ed) *Sydney: the Emergence of a World City*. Oxford University Press, Melbourne, 119–143.
- Friedberger, M., 2000: The rural-urban fringe in the late twentieth century. *Agricultural History* 74, 502–514.
- Furuseth, O. and Lapping, M., (eds) 1999: *Contested Countryside: the Rural Urban Fringe in North America*. Ashgate Publishing, Aldershot, UK.
- Gilmour, A., 2001: Achieving better environmental outcomes. *Australian Planner* 38, 96–101.
- Gleeson, B. and Low, N., 2000: *Australian Urban Planning: New Challenges, New Agendas*. Allen and Unwin, Sydney.
- Golledge, R., 1960: Sydney's metropolitan fringe: a study in urban-rural relations. *Australian Geographer* 7, 243–55.
- Hall, P., Gracey, H., Drewett, R. and Thomas, R., (eds) 1973: *The Containment of Urban England: Volume 1 — Urban and Metropolitan Growth Processes*. Allen and Unwin, London.
- Hamnett, S. and Freestone, R., (eds) 2000: *The Australian Metropolis: a Planning History*. Allen and Unwin, Sydney.
- Hart, S., 2002: The Hills Face Zone. *South Australian Planner* April, 28–31.
- Healthy Rivers Commission of New South Wales, 1998: *Independent Inquiry into the Hawkesbury-Nepean River System*. Peter Crawford, Commissioner, Final Report.
- Henderson, S. and Epps, R., 2001: *Urban Fringe Land Use Conflict: Two Poultry Case Studies*. Rural Industries Research and Development Corporation Publication 00/174, Canberra.
- Holliday, S., 2000: The higher density debate. *New Planner* 42, 6 and 15.
- Holliday, S. and Norton, R., 1995: Sydney's Future — Quo Vadis? *Urban Futures* 17, 13–19.
- Houston, P., 2003 Re-valuing the fringe: some findings on the value of peri-urban agriculture in Australia. *Unpublished manuscript available from the author*.
- Hugo, G.J., 1989: Australia: the spatial concentration of the turnaround. In Champion, A.G. (ed) *Counterurbanization — The Changing Pace and Nature of Population Deconcentration*. Edward Arnold, London.
- Johnson, N.L., Kelleher, F.M. and Chant, J.J., 1998: The future of agriculture in the peri-urban fringe of Sydney. *Proceedings of the 9th Australian Agronomy Conference*, Wagga Wagga, July 1998, 613–616.
- Knapp, G. and Nelson, A.C., 1992: *The Regulated Landscape: Lessons on State Land Use Planning from Oregon*. Lincoln Institute of Land Policy, Cambridge, Mass.
- Langworthy, A. and Hackett, T., 2000: *Farming Real Estate? Challenges and Opportunities for Agribusiness in the Urban Fringe—Yarra Valley Region*. Centre for Business and Communication, Swinburne University of Technology, Lilydale, Victoria.
- Lehman, T., 1995: *Public Values, Private Lands: Farmland Preservation Policy 1933–1985*. University of North Carolina Press, Chapel Hill, N.C.
- Maher, C.A. and Stimson, R.J., 1994: *Regional Population Growth in Australia: Nature, Impacts and Implications*. AGPS, Bureau of Immigration, Multicultural and Population Research, Canberra.
- McCaskill, M., 1979: *The Development of Planning Policies for the Adelaide Hills*. Proceedings of 10th New Zealand Geography Conference. New Zealand Geographical Society, Auckland, 171–176.
- McKenzie, F., 1996: *Beyond the Suburbs: Population Change in the Major Exurban Regions of Australia*. AGPS, Canberra.
- McKenzie, F., 1997: Growth management or encouragement: a critical view of land use policies affecting Australia's major exurban regions. *Urban Policy and Research* 15, 83–99.
- McLoughlin, J.B., 1969: *Urban and Regional Planning: a Systems Approach*. Faber and Faber, London.
- Major Projects Group, no date: Virginia Pipeline, SA Department of Administrative and Information Services. <http://majorprojects.sa.gov.au/projects/virginiaPipeline.htm>
- Mant, J., 1988: The instruments of planning: urban management. *Urban Research Unit Working Paper* 6, Research School of Social Sciences, Australian National University, Canberra, 17–35.
- Menzies, B. and Bell, M., 1981: *Peri-urban Development: a Case Study of the Adelaide Hills*. Department of Agriculture, South Australia, Extension Research and Evaluation Unit, Research Monograph 2, Adelaide.
- Minister for Transport and Urban Planning, 2000: *System Improvement Program — Outline Paper Three*. Adelaide.
- Moseley, S., 1999: Development policies and water resource management: round pegs and square holes? Paper delivered to the Conference on Managing South Australia's

- Water Resources — Policy, Practice and Law, Adelaide Hilton Hotel, 10 December, National Environmental Law Association and the Royal Australian Planning Institute.
- Murphy, P.A. and Burnley, I.H., 1993: Socio-demographic structure of Sydney's perimetropolitan region. *Journal of the Australian Population Association* 10, 127–144.
- National Population Council, 1992: *Population Issues and Australia's Future: Environment, Economy and Society*. Final Report of the Population Issues Subcommittee, AGPS, Canberra.
- New South Wales Agriculture, 1998: *Strategic Plan for Sustainable Agriculture — Sydney Region*. NSW Agriculture, Orange.
- Newby, H., 1996: Social Change in rural England. *Town and Country Planning* 65, 46–49.
- NRMMC, 2002: *Australia's National Framework for Environmental Management Systems (EMS) in Agriculture*. Standing Committee to the Natural Resources Management Ministerial Council, Canberra.
- Pfeffer, M.J. and Wagenet, L.P., 1999: Planning for environmental responsibility and equity: critical appraisal of rural-urban relations in the New York City watershed. In Furuseth, O.J. and Lapping, M.B. (eds) *Contested Countryside: the Rural-Urban Fringe in North America*. Ashgate Publishing, Aldershot, UK, 179–205.
- PIRSA, 1999: Agricultural dispute avoidance and resolution. Unpublished briefing paper on a national survey for the Premier's Round Table on Agriculture in Peri-urban Areas. Primary Industries and Resources SA, Adelaide.
- Planning SA, 2001: *Development in Rural Areas: Preparing Development Plan Policies for Rural South Australia*. Planning Bulletin 1st edition. Department for Transport, Urban Planning and the Arts, Adelaide.
- Planning SA, 2002: *Metropolitan Urban Boundary PAR* (Ministerial Plan Amendment Report to limit urban sprawl). Department of Transport and Urban Planning, Adelaide.
- Royal Australian Planning Institute Journal 1968: 16, July and October issues dealing with major physical infrastructure systems.
- Rutherford, J., 1966: Farming in the Sydney region. In Rutherford, J., Logan, M.I. and Missen, G.J. (eds) *New Viewpoints in Economic Geography*. Martindale Press, Sydney, 245–273.
- Rutherford, J., Burdekin, H. and MacGregor, I., 1971: *Case studies of Changing Population and Land use on the Periphery of Metropolitan Sydney*. Research Paper 16, Department of Geography, University of Sydney and The Geographical Society of New South Wales.
- Sinclair, I., 1999: Growing food and growing houses: preserving agricultural land in the fringe of cities. In Robertson, A. and Watts, R. (eds) *Preserving Rural Australia: Issues and Solutions*. CSIRO Publishing, Melbourne, 110–124.
- South Australian State Planning Authority, 1975: *Outer Metropolitan Planning Area Development Plan*. State Planning Authority, Adelaide.
- Spearritt, P. and DeMarco, C., 1988: *Planning Sydney's Future*. Allen and Unwin, Sydney.
- State Planning Authority of NSW, 1967: *Prelude to a Plan*. State Planning Authority, Sydney.
- State Planning Authority of NSW, 1968: *Sydney Region Outline Plan 1970–2000 AD: a Strategy for Development*. State Planning Authority, Sydney.
- Total Environment Centre, 1999: *Greenprint for Sydney: an Environmental Strategy for the 21st Century*. Total Environment Centre, Sydney.
- Tonts, M. and Greive, S., 2002: Commodification and creative destruction in the Australian rural landscape: the case of Bridgetown, Western Australia. *Australian Geographical Studies* 40, 58–70.
- Totaro, P. and Nicholls, S., 2002: The Big Squeeze. *Sydney Morning Herald* (30 November and 1 December), 25 and 34.
- Town Planning Committee, 1962: *Report on the Metropolitan Area of Adelaide*. Government Printer, Adelaide.
- Verity, W., 2003: Up the garden path. *Sydney Morning Herald* (10 February), 11.
- Winston, D., 1957: *Sydney's Great Experiment: the Progress of the Cumberland County Plan*. Angus and Robertson, Sydney.
- Winterbottom, D., 2002: Journal jottings: alternative crops. *Australian Planner* 39, 167.