

Planning for sustainable cities and regions: an audit of local environmental plans in NSW

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Abstract

To what extent do local planning frameworks promote sustainable growth and change in Australian cities and regions? This paper begins to address this question with reference to the results of an online survey of more than 100 NSW local environmental plans, undertaken between August 2007-2008. The data was collected as part of a broader, ongoing survey of Australian planning instruments (maintained by the Australian Urban Planning Policy Monitor; <http://ppm.arch.usyd.edu.au>). Focusing on the single state jurisdiction of NSW to minimise differences arising from higher level state planning policies and legislation, the paper discusses the ways in which local environmental plans address objectives relating to sustainable urban form and resource use, biodiversity conservation and enhancement, and climate change mitigation and adaptation. The first part of the paper summarises the range of planning approaches for achieving sustainable urban form, resource use, biodiversity conservation, as well as climate change adaptation and mitigation, drawing on the extensive research and literature on sustainable planning practice. The second part of the paper reviews the extent to which such approaches are applied in NSW plans, and highlights differences between their urban and regional application in the context of higher level state, metropolitan or regional planning policy and local planning provisions. Broader implications for sustainable planning practice are identified in conclusion.

Introduction

Australian urban policy is saturated with references to environmentally sustainable development and its significance in managing processes of metropolitan and regional change. All Australian planning laws reference sustainability in their objectives; state and territorial planning policy frameworks include specific goals and provisions relating to aspects of environmental protection and conservation; and the range of existing metropolitan strategies or equivalent (for Adelaide, Canberra, Brisbane, Melbourne, Perth, and Sydney) seek to achieve sustainable patterns of urban growth (Gurran 2007). But to what extent are the principles of ecologically sustainable development - 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs' (WCED 1987, p. 43) - actually reflected and reinforced within local planning schemes?

Statutory planning schemes, generally long winded, opaque, and lacking the discursive spice of more strategic policy documents, often escape serious community and academic scrutiny. Yet as the legally enforceable framework governing land use decisions in relation to a specific place, local planning schemes arguably represent the crucible of sustainability practice. It is therefore surprising that we lack a way to systematically assess and review the content of local plans aside from the rather loose processes of periodic high level policy prescription and sanction when schemes are intermittently authorised or amended.

Local governments exercise discretion in formulating their plans and policies within the context of regional, state, or national planning policy. This results in significant plan diversity and makes it difficult to assess the policy content of local plans in a collective sense (Gyourke et al. 2009, Pendall et al. 2006). For example, in Australia, despite a wave of reform intended to standardise the format of local planning schemes, we lack a system for monitoring the extent to which strategic policy goals like energy efficiency, sustainable waste management, or climate change adaptation, are implemented through local provisions. Therefore, aside from knowledge of mandatory state planning requirements, to the extent that these exist within various jurisdictions, we lack basic information about the ways in which local authorities are defining and implementing sustainability goals at city and neighbourhood scales.

The preliminary research presented here attempts to unlock such information through an online survey and database of Australian land use plans. The Australian Urban Land Use Planning Survey, launched in May 2007, seeks to quantify current practice in sustainable urban form (density, transit orientation, energy efficiency); biodiversity conservation (protecting important ecological communities and landforms, managing the interface between natural protected and urban areas, and resilience to climate change), as well as approaches to social sustainability through measures relating to housing diversity and affordability. The data set extends to all Australian planning jurisdictions and is able to be continually updated within a searchable policy database known as the 'Australian Urban Land Use Planning Policy Monitor' (<http://ppm.arch.usyd.edu.au>).

This paper presents preliminary findings from the survey of principle local planning schemes (known in NSW as "local environmental plans", or "LEPs") applying to over 100 urban and regional municipalities across the state. To provide context for these findings, we first

summarise the range of planning approaches for achieving sustainable urban form, resource use, biodiversity conservation, as well as climate change adaptation and mitigation, drawing on previous research and literature. We then present our initial findings regarding the prevalence of such approaches in NSW plans, highlighting differences between their urban and regional application. Finally, we suggest broader implications for sustainable planning practice.

Planning for sustainable cities and regions: Measures and techniques

There are many ways to incorporate sustainability principles within local planning schemes; when land is allocated, permissible uses defined, plan objectives set and design standards prescribed. Prevailing approaches to sustainable urban form emphasise denser, more compact forms of development, to achieve more efficient use of existing infrastructure and to minimise the conversion of farm lands and habitat (Williams et al. 2000). Integrating compatible uses to minimise dependence on motorised transport is also an established element of sustainable urban form, reducing carbon dioxide emissions associated with the private motor car (Newman, 2006). But traditional land use planning approaches focus on functional separation, rather than integration. Therefore planning schemes will promote more sustainable urban form by reforming standard zoning patterns to enable mixed residential, commercial, or other compatible forms of development, particularly within urban centres, and by promoting higher residential densities near public transport. In addition, planning schemes can promote sustainable urban forms through urban design configurations and requirements that promote walking and cycling.

There have been important advances in sustainable building design and regulatory standards have an important role to play in sponsoring the adoption of such new technology. Mandatory requirements within construction standards, such as the Building Code of Australia (BCA) can significantly improve the environmental performance of new buildings, as can planning policies for climate sensitive design, energy and water efficiency (Low et al., 2005, Kay et al., 2004). Retaining or restoring endogenous (locally occurring) species can reduce the need for water while also contributing to local biodiversity, so native landscaping provisions are beginning to appear in local plans (Fallding et al., 2001). Similarly, Water Sensitive Urban Design (WSUD) techniques which introduce more ecologically sensitive approaches to water collection and management also reduce the need for new water supply and treatment facilities (Kay et al., 2004, McManus, 2005). Waste minimisation and management stipulations may also appear in local plans as objectives or requirements to maximise reuse and recycling of building materials, minimise waste during construction, and to implement ongoing waste storage and recycling arrangements (McManus, 2005).

Beyond the site itself, principles of sustainable resource management emphasise the importance of satisfying essential community needs (food, water, and other essential products) from within a local region, and managing waste within the same area (Beatley, 1995; 2004). Planning requirements that preserve spaces for food production and waste reuse/recycling in new developments and surrounding urban peripheries can implement these goals. Similarly, planning controls protect biodiversity by seeking to minimise the impacts of urban settlement or activities on natural systems, by avoiding ecologically sensitive areas like wildlife habitat or

water foreshores through development prohibitions or other management and mitigation approaches (Beatley and Manning, 1997; Fallding et al., 2001).

While concern about the carbon impact of the built environment is relatively recent, many of the more long standing approaches described above provide a basis for ensuring that new developments reduce potential contributions to climate change. Examples include design regulations that reduce reliance on non renewable sources of energy, and zoning or land allocation designed to decrease car dependency through mixed use locations encouraging contained urban form (Ewing et al., 2007). Other approaches are the inclusion of objectives or explicit criteria within plans for considering the potential for major development proposals to impact on carbon emissions either within the local area or 'downstream'. Similarly, planning regulations can provide a basis for adapting to the consequences of climate change that are already underway. Examples include explicit objectives or criteria relating to potential enhanced climate change impacts, revised design and building standards, or special expert assessment for developments likely to be affected by the hotter temperatures, increased likelihood of bushfires, more frequent or intense storms and floods that are anticipated under medium term climate change scenarios (ODPM 2004).

We have outlined the basic goals and approaches for promoting sustainability through land use plans. These include meaningful objectives, appropriate land use allocations and controls to preserve biodiversity and natural resources, development standards for energy and water efficiency and adaptation to climate change. Nevertheless, despite growing awareness of the importance of sustainable urban settlement, particularly in the context of impending climate change, little is known about how and to what extent Australian land use plans include such provisions.

Sustainability practice in NSW Plan Making

As we have noted, local planning schemes are notoriously heterogeneous. This is particularly so in NSW, where standard templates for plan writing (for instance, as used in Victoria and South Australia) are only just in the process of implementation. There are methodological and technical challenges associated with collecting accurate and up to date data on diverse planning approaches across multiple local or state jurisdictions (Lewis and Neiman 2002). Some researchers have addressed this problem by undertaking case studies or content analyses of smaller samples, but it is difficult to extrapolate to broader practice from such methods. A number of surveys of plan content have examined specific aspects of local planning policy, including sustainable transport, climate change, and coastal development (ALGA 2005, Aytur et al. 2008, DCLG 2002, Lewis and Neiman 2000, Librett et al. 2003, Pendall et al. 2006, TCPA 2006). As well, a small but growing number of studies have surveyed local planning regulations as a basis for examining impacts on house prices (associated with growth restrictions) or overall plan performance (the extent to which regulations increase demand for housing, expressed in house prices) (Glaeser and Wards 2009, Ihlanfeldt 2009, Lewis and Neiman 2000, Pendall et al 2006).

Research method

Our research has some similarity with these studies in that it focuses on key forms of development control as defined within local planning schemes. However, there are several differences in design and implementation, due in part to the differences in planning systems and processes in Australia. Our ongoing goal is to establish a dynamic reservoir of data about local planning regulation, to examine contemporary planning approaches across several key policy areas (eg. sustainable urban form, environmental performance, climate change, housing choice and affordability) and to allow plan changes to be tracked over time. Rather than solely relying on interviews with planners and officials as a basis for data collection, or on a snapshot survey, we are using an online instrument which can be completed by professional planners operating within the jurisdiction (consistent with the surveys described above) or by researchers with planning qualifications (consistent with the approaches used in plan content analysis).

While we report in this paper on the content of plans in NSW, our overall study is being conducted nationally. Therefore a major challenge was to construct a valid questionnaire able to resonate across the variety of planning systems and approaches across Australia. We referred to principles of internet survey design (which relate to appearance, format and question order) in our construction of the questionnaire (which can be viewed at: <http://ppm.arch.usyd.edu.au>) (Burkey and Kuecher, 2003). It was piloted in late April 2007, then administered online between May and August 2007. This approach has yielded 76 local government area participants to date, a response rate of approximately 11 per cent in total but over 20 per cent for NSW. The relatively low response rate is likely to be due to the mode of survey delivery, as response rates for internet administered surveys are unclear (Burkey and Kuechler, 2003, Iraguen and Ortuzar, 2003). We then used data assistants to supplement this data to achieve coverage of 132 local jurisdictions in NSW, representing 86 per cent of all jurisdictions. The small number of jurisdictions not represented relates to differences in planning scheme (for instance, some principal schemes predate the introduction of the NSW Environmental Planning and Assessment Act 1979). Participation in the survey is strictly anonymous – while the researchers are able to identify each local government data set, individual information about local government plan performance is not released. This avoids the perception that the data can be used to “name and shame” individual councils.

In terms of research validity, our key concerns were the reliability of the measurement tool (i.e. the questionnaire) and the reliability of responses. To ensure a reliable questionnaire, we sought professional input through a small professional reference group who substantiated the interpretation of key planning approaches and the transferability of categories across jurisdictions. The web survey was designed to support interaction in ways that are similar to a face to face survey, through pop up explanations of terms and questions, reducing potential for respondent error and item non response (Burkey and Kuechler, 2003; Iraguen and Ortuzar, 2003). The responses obtained from professional local planners are judged to be highly reliable, but there is greater potential for error associated with research assistance. We addressed this issue as much as possible by supervising data entry.

Results: Sustainable urban form and climate change

To examine how NSW Local Environmental Plans (LEPs) promote sustainable urban form, we sought data on the inclusion of mixed use zones (defined as permitting co-location of activities), incentives to further encourage mixed use (in particular incentives for mixed commercial and residential development) and promotion of higher density housing near services or public transport or services.

Insert Figure One around here

As shown in Figure One, just over half of LEPs in NSW permit a combination of uses (for instance, mixed commercial and residential development) within designated areas, and less than a third of plans seek to encourage higher residential densities near services or public transport. Just under twenty per cent of LEPs contain measures to actively promote mixed use development through incentives (usually increased development potential) for proposals that combine uses, such as mixed residential / retail development.

Insert Figure Two around here

To measure approaches to sustainable transportation, we examined the inclusion of requirements for footpaths and bicycle paths within new developments (just over 10 per cent of LEPs) (Figure two). Around eight per cent of NSW plans permit reduced parking for developments near public transport, and a small number of plans also include requirements for bike facilities within places of employment.

State planning legislation mandating minimum energy and water efficiencies within new residential development (known as the “Building Sustainability Index”, or “BASIX”), now limit the potential for local authorities to specify their own standards within new LEPs if these overlap with matters covered by BASIX. Nevertheless, provisions for energy and water savings, and sustainable waste management requirements are implemented in about a fifth of the authorities surveyed (Figure Three).

Insert Figure Three around here

Biodiversity conservation

We measured biodiversity conservation in local plans by the inclusion of specific provisions to protect wildlife habitat, wetlands, native vegetation, catchments, coastal features and processes, and the interface between protected natural areas and surrounding lands. As shown in Figure Four, land use zones are the most commonly used approach to biodiversity conservation in NSW, used by around half of the authorities represented to designate sensitive areas to protect native vegetation and landscape values from development pressure. Development prohibitions, special assessment criteria to determine environmental impact of proposals; and referrals to specialist agencies are also used to protect wildlife habitat, wetlands, catchments, and coasts.

Insert Figure Four around here

A series of sub questions focused on explicit objectives or merit criteria relating to climate change adaptation, including reducing vulnerability to bushfire (Figure Five). The question also included references to climate change mitigation, for instance, as a matter to consider in the environmental assessment of major projects.

Insert Figure five around here

As shown, few NSW LEPs address climate change mitigation or adaptation, aside from explicit provisions to reduce vulnerability to bushfire (just over 25 per cent of plans), which is in addition to guiding state policy and regulation.

The survey also includes questions on the inclusion of more innovative approaches to promoting sustainable urban development – such as offsets which permit certain activities provided that they are offset by conservation actions elsewhere (included in 6 per cent of NSW plans), clustering to enable more intense development in appropriate locations while preserving more sensitive areas of a particular site (14% of plans); incentives to support voluntary conservation agreements, and an explicit or implicit cap on future population (Table One).

Insert Table One around here

Differences in regional application

As well as examining overall content of planning approaches for sustainable urban form and biodiversity conservation in NSW, we were also interested in patterns of regional variation associated with different planning approaches or mechanisms. As noted, previous surveys of local planning controls identify much variation in plan approach and the inclusion of specific provisions, attributed in part to historical features of the local area, and social or demographic characteristics of the local population (Glaeser and Wards 2009). While not yet conclusive, such research suggests that in the United States at least, higher income, less racially mixed communities are more likely to have more planning regulations in place, including environmental regulations, than lower income, more racially mixed localities, which appear likely to have fewer overall regulations and particularly less restrictions on development (Gyourko et al. 2008).

In relation to our own sample of 132 localities in NSW, a simple distinction between metropolitan and regional or rural local government areas is sufficient to account for many of the differences in approaches to sustainability planning apparent in the results presented above. This analysis reveals little apparent variation in sustainability planning measures due to the socio-economic characteristics of local authorities, but sharp variations associated with known geographical features, such as coastlines and water bodies; bushland and natural areas; or established public transport systems. For instance, as expected, plans including provisions for higher density near public transport, were predominantly for accessible metropolitan locations; while protections for native vegetation, wildlife habitat, and catchment values are largely found in plans relating to regional and rural localities. Provisions to protect landscape values are strongly associated with coastal local government areas and those applying to rural locations. However, in common with the findings of other studies (eg. Gyourko et al. 2008), it was

apparent that inclusion of particular planning provisions was strongly associated with the inclusion of others – so that a cluster of local government areas are associated with having a high number of planning provisions, across all environmental sustainability measures assessed. This suggests that in Australia, as in the United States, local authorities may be distinguished on the basis of regulatory intensity, in this case, relating to green performance.

Limitations and notes on interpretation

The results presented here should be interpreted with some caution. Firstly, they represent a preliminary sample of NSW local government areas included in the Australian Urban Land Use Planning Policy Monitor Database (as at August 2008). Additional work to measure the validity of local authority returned results, research assistant plan reviews, and differences between each is still being carried out. Secondly, as the first tranche of survey responses it is difficult to evaluate the overall sustainability performance of plans in NSW, given the absence of existing baseline data. Subsequent runs of the survey will provide a benchmark for comparison. Finally, it is important to recognise that the overall results presented here do not extend to the existence of guiding policies. This means that only provisions contained in the primary statutory LEP are recorded with certainty. Many local authorities have non enforceable or discretionary tools to address sustainability goals, and most will be covered by additional state requirements relating to specific policy areas. Under the NSW planning system, such state policy currently sits beyond the principle LEP framework.

Conclusion: Implications for sustainable planning practice

This paper reports on one of the first interrogations of a database of Australian planning statutory instruments. One of the main findings of the study to date is the lack of references to sustainable planning in the statutory documents examined. Are local government that far off the pace when it comes to dealing with such basic sustainability issues such as climate change?

In the defence of Local Government, there are a number of potential reasons why the statutory plans might not reflect a council's attitude to sustainability. Firstly, as previously mentioned, councils might address sustainability through non-statutory policy documents. Secondly, there may be a timelag between policy prescription – many of the statutory planning documents are quite old – the next version of the plans might reflect a more robust approach to sustainability in the plan itself. Thirdly there might be a lack of knowledge or training amongst plan makers about the opportunities for incorporating sustainability elements into their statutory plans. Lastly, there might be a State government failure, which may stem from either a lack of policy engagement with local authorities about the sustainability issue in general or a lack of opportunity for incorporating local innovation in local plans. Of particular interest in this regards will be the extent to which the new standard template for local statutory plans is seen as something that encourages or discourages this local approach to sustainability in NSW. Subsequent plan content surveys as the Australian Planning Policy database is updated will provide an opportunity to track such issues over time. Nevertheless, what is clear is that NSW planners are currently missing an opportunity to explicitly include sustainability in the statutory framework for their jurisdictions.

An overriding implication of our findings is that planning policy rhetoric does not readily translate to a change in planning law, particularly at the local level. If statutory weight is important, much greater effort is needed to ensure that local planning instruments in NSW contain specific objectives and provisions relating to sustainable urban form and design, biodiversity conservation and climate change. While not presented in this paper, preliminary reviews of Australian Planning Policy Monitor data pertaining to other jurisdictions suggest that one of the most effective ways of integrating such concerns within local statutory schemes is to do so directly, as occurs in Victoria and South Australia. However, not all state policy is more progressive than that enacted by local government, as shown by the small but significant number of NSW councils who have enacted innovative provisions for issues like waste management, sustainable transport, biodiversity, and climate change. In promoting better local planning practice there is an opportunity to support and extend such innovation. Given the importance of statutory plans in impacting development in Australia, we hope that the Australian Planning Policy Monitor database will provide an ongoing resource for supporting such work and for broader research and teaching in Australian urban issues¹.

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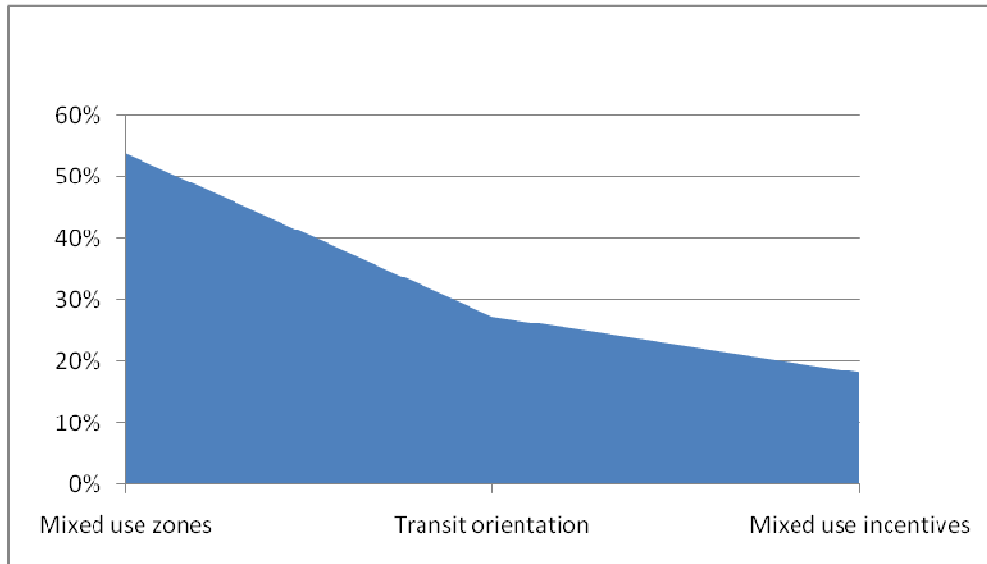
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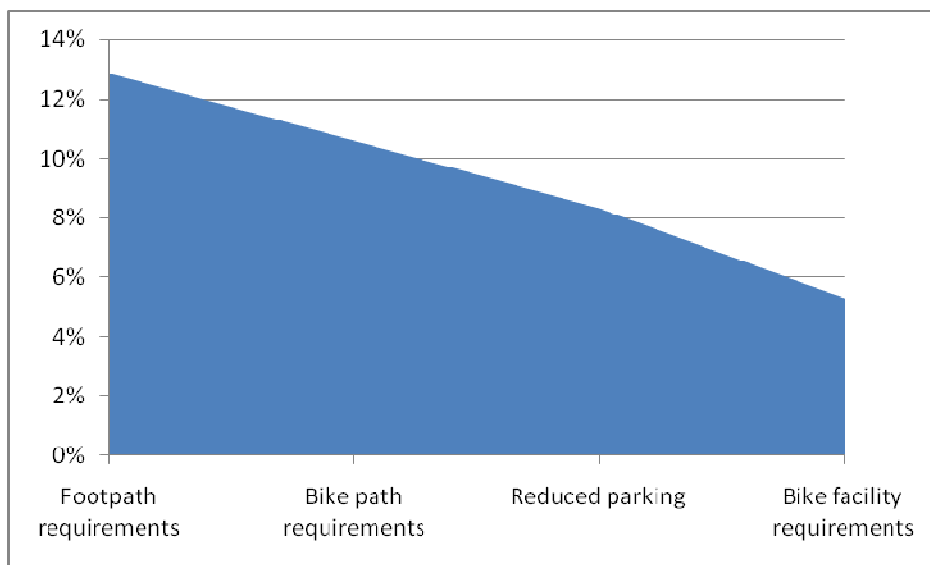
Figures

Figure One: NSW planning provisions for sustainable urban form



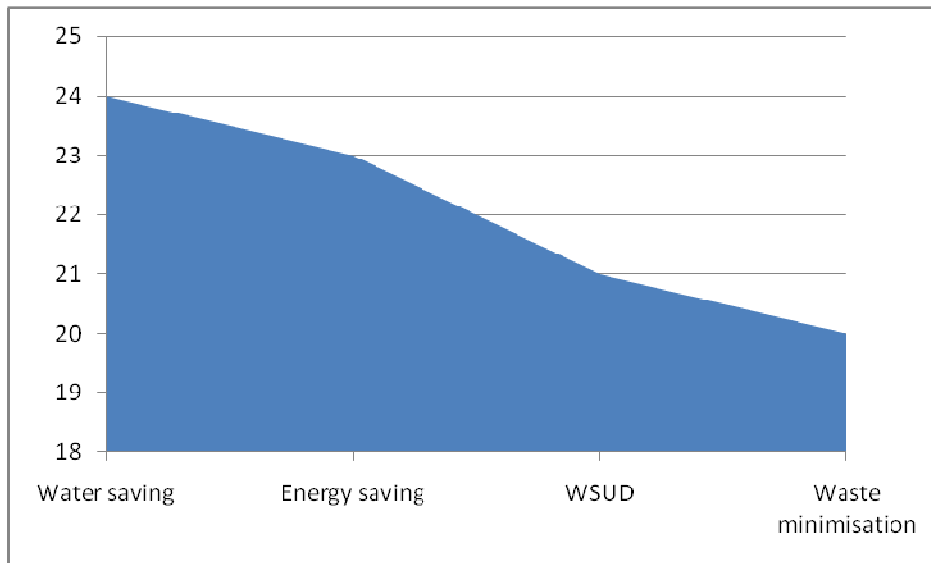
Source: Australian Urban Land Use Planning Policy Monitor data (August 2008) (N = 132).

Figure Two: NSW planning provisions for sustainable transportation



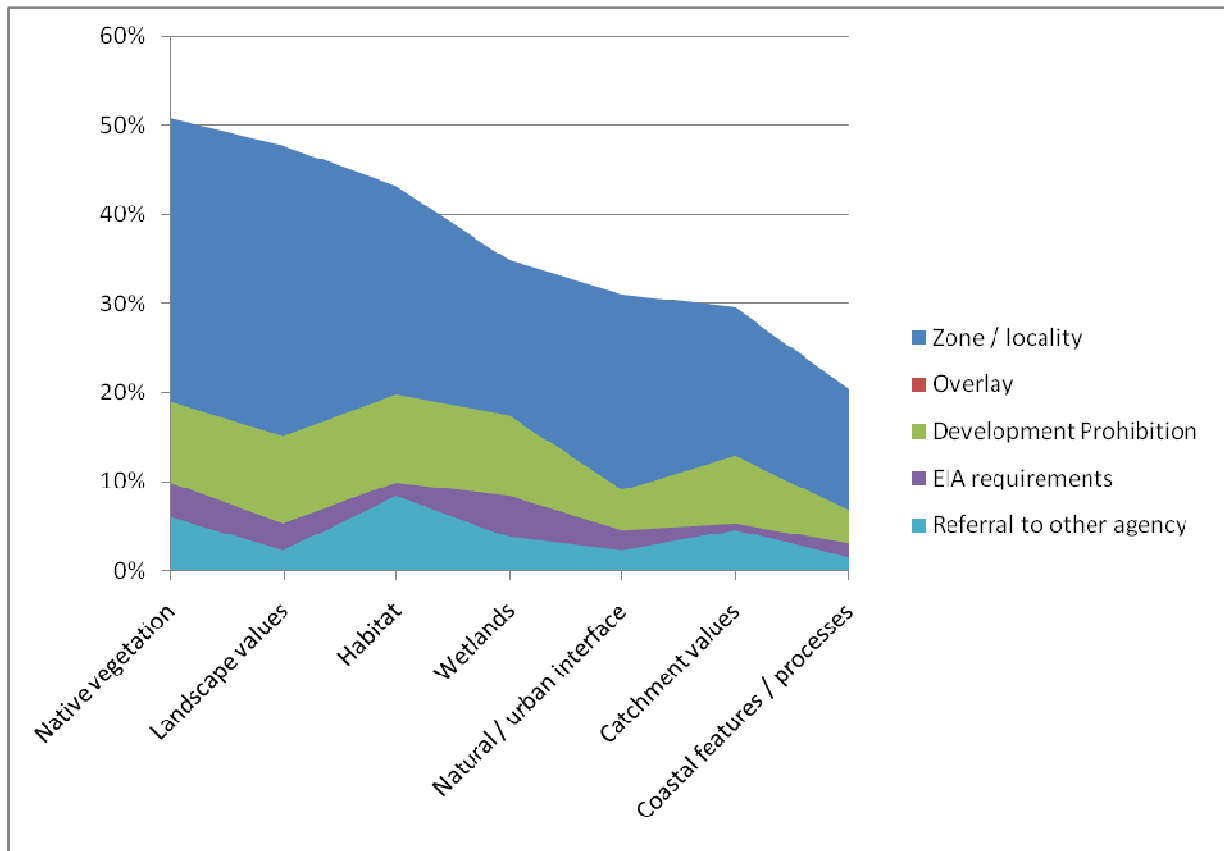
Source: Australian Urban Land Use Planning Policy Monitor data (August 2008) (N = 132).

Figure Three: NSW planning provisions for resource efficiency



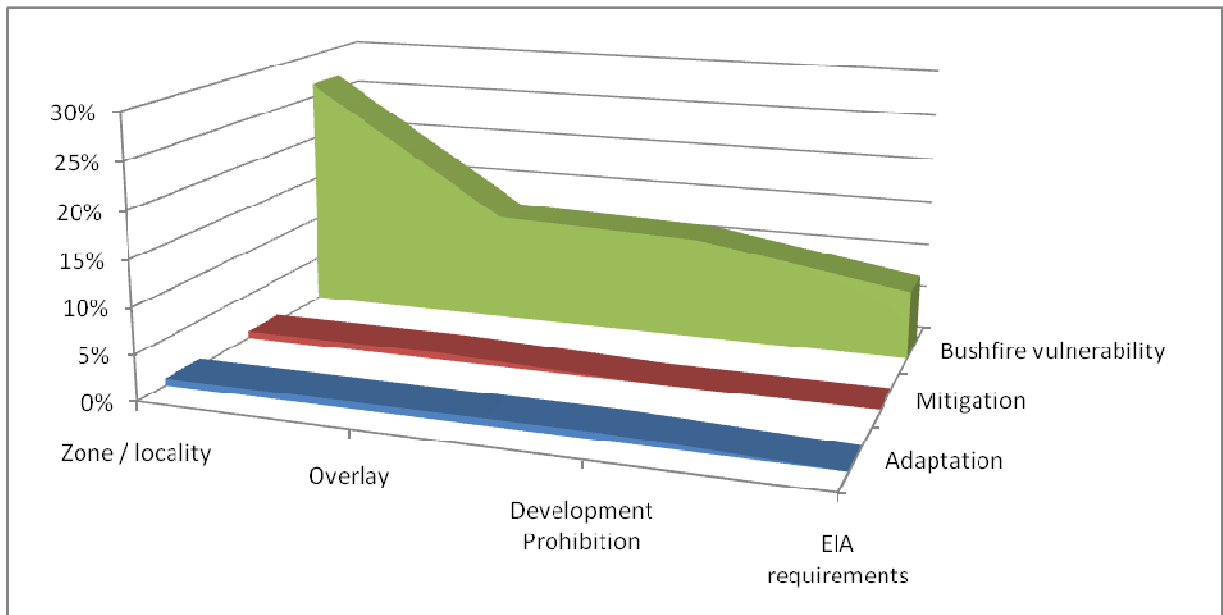
Source: Australian Urban Land Use Planning Policy Monitor data (August 2008) (N = 132).

Figure Four: Planning provisions for biodiversity conservation



Source: Australian Urban Land Use Planning Policy Monitor data (August 2008) (N = 132).

Figure Five: Provisions for climate change mitigation and adaptation



Source: Australian Urban Land Use Planning Policy Monitor data (August 2008) (N = 132).

Table One: Emerging approaches to environmental conservation in NSW

Plan content / requirement	Plan
Offsets	6%
Clustering	14%
Urban Growth Boundary	16%
Population Cap	2%
Incentives for conservation agreements	16%

Source: Australian Urban Land Use Planning Policy Monitor data (August 2008) (N = 132).

Endnotes

ⁱ Those interested in using the Monitor are asked to consult the authors.