

Chapter 6

PLANNING FOR SUSTAINABLE CHANGE: A REVIEW OF AUSTRALIAN LOCAL PLANNING SCHEMES

Nicole Gurrán and Peter Phibbs

Sustainable development, defined by the World Commission on Environment and Development as ‘development that meets the needs of the present without compromising the ability of future generations to meet their own needs’, has become a global policy objective with particular resonance for planners (WCED, 1987: p. 43). Many international, national, state and regional policy frameworks emphasise the need to improve the environmental performance of cities and regions and to conserve and renew biodiversity. The increasing prospect of global climatic volatility – hotter temperatures, sea level rise, intense storm events, flooding and bushfires, have added a new urgency for planning and design regulations that build community resilience to withstand impacts of climate change (Hennessy et al., 2007).

Statutory land use plans are the primary instrument for such regulations. Often known as ‘planning instruments’, ‘planning schemes’ (many Australian jurisdictions), ‘development plans’ (the United Kingdom), or ‘comprehensive plans’ (the United States), statutory land use plans establish the principal policies and controls regulating development within a given area. They are usually prepared by local planning authorities but within the legal and policy framework established by higher jurisdictions (state government authorities in Australia and the United States, national government in the United Kingdom and New Zealand, and provincial or regional bodies in Canada and many European nations). Although prepared under consistent regulatory and policy requirements, land use plans generally differ markedly in terms of scope, policy goals, mechanisms and controls.

Despite the important role played by local plans in implementing higher level environmental and social planning goals, empirical studies of plan content are surprisingly rare. This means that it is difficult to estimate

the extent to which local plans contain objectives and provisions relating to sustainability, from environmental design to biodiversity conservation or climate change preparedness. Biodiversity is the ‘variety of life forms, the different plants, animals and micro-organisms, the genes they contain and the ecosystems they form’ (NPWS, 1999: p. 70).

The Australian Urban Land Use Planning Policy Survey was designed to address such knowledge gaps, examining local approaches to environmental sustainability and housing diversity, choice and affordability. This chapter presents an analysis from the first round of responses to the survey (as at April 2008), focusing on responses relating to sustainability and urban form, environmental protection, and climate change. It firstly explains the spectrum of emerging planning approaches for sustainable urban form (provisions for density, transportation, energy, water and waste management) and biodiversity conservation (protecting important ecological communities and landforms, managing the interface between natural protected and urban areas, and resilience to climate change).

The chapter then presents the initial results of the survey to show the extent to which such approaches are included in local statutory plans across a sample of 129 local authorities from Australian cities and regions. All Australian states and the Australian Capital Territory are included in the initial sample. The Northern Territory, which has a distinctly different planning framework to the other jurisdictions, was excluded from the initial sample but will be represented in the complete database. The chapter concludes by identifying key areas for additional policy work and development in Australian local planning for sustainability and climate change resilience.

Local sustainability planning

All environmental planning legislation of the Australian states and territories refers to sustainability objectives or decision-making criteria, although terminology differs somewhat across the jurisdictions (Gurran, 2007). Under Australia’s federalised system of government, the states and territories have the main responsibility for environmental planning and assessment. The Commonwealth Government’s limited roles relate to certain defined matters of ‘national environmental significance’ as defined under the *Commonwealth Environment Protection and Biodiversity*

Conservation Act 1999. At the national level, the terms ‘environmentally’ or ‘ecologically’ sustainable development predominate, defined as ‘using, conserving and enhancing the community’s resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased’ (Commonwealth of Australia, 1992). National environmental legislation defines ‘principles’ of ‘environmentally sustainable development’ as follows:

- Decision-making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations;
- If there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation;
- The principle of inter-generational equity: that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations;
- The conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making;
- Improved valuation, pricing and incentive mechanisms should be promoted (*Commonwealth Environment Protection and Biodiversity Conservation Act 1999*, Part 3A).

While such high level principles establish an important policy framework, translation into specific land use and development regulations is complex. Translating national and international sustainability principles into local land use plans is always a challenge (Dyck, 1998). However, federal divides in nations such as Australia and the United States likely make this process more fragmented and variable than in unitary countries such as England where national planning policy is articulated directly for local implementation. The next section outlines approaches to promoting sustainability through the process of preparing local plans and assessing development proposals against these plans.

Sustainability and local planning controls

The local planning process offers several basic planning mechanisms that can be used to improve the environmental performance of cities and regions and to conserve and renew biodiversity. Allocating land for particular uses and combinations of uses, establishing limits to urban settlements, fixing standards for development and criteria to assess proposals, stipulating conditions of development approval, and refusing development that has unacceptable impacts, are important tools for promoting sustainable urban development (Gurran, 2007). The planning goal in relation to biodiversity is to minimise impacts of urban settlement or activities on natural systems. This means that when land is allocated for new development or for an intensification of existing uses, ecologically sensitive areas like wildlife habitat or water foreshores must be avoided and any likely impact from development within nearby areas must be managed (Beatley and Manning, 1997; Fallding et al., 2001).

Decisions about urban form can improve the environmental performance of cities in terms of energy and water use and the generation of waste, and can also contribute to biodiversity protection. By promoting denser, more compact forms of development, total land and habitat disturbance is minimised. Another important way in which urban form can contribute to sustainability is by reducing the number of trips by motor transport needed to undertake daily activities – going to work, school, childcare, shopping and so on (Newman and Kenworthy, 1999). Advocates of compact urban form argue for better integration of compatible uses and the consolidation or reuse of under-utilised existing urban areas. It is claimed that compact urban forms can reduce carbon dioxide emissions associated with the private motor car and promote an efficient use of the existing urban infrastructure (Newman, 2006). Basic planning mechanisms for achieving these goals are reforming standard zoning patterns that separate residential, commercial and other uses by enabling mixed development in selected urban centres, and promoting higher residential densities near public transport.

There are some analysts who argue against containment on the basis that biodiversity is maximised through detached housing surrounded by domestic trees and gardens (Troy, 1990). However, in the context of large metropolitan areas, the weight of evidence suggests that benefits of dispersed development are outweighed by the loss of rural hinterland or

remnant native vegetation and the environmental costs of car dependence as distance to services increases on the urban periphery (Newman, 2006; Williams et al., 2000).

Density is usually achieved in new 'greenfield' areas by permitting smaller lot sizes and a greater diversity of dwellings including villas, townhouses and sometimes apartments. It is important to recognise, however, that higher density forms of housing are not inherently sustainable (Holloway and Bunker, 2006). Concerns relate to the use of 'embodied' energy in building materials (all of the energy that is involved in the construction of the building, including the energy needed to produce and transport construction materials), and the ongoing use of energy and water resources by occupants. In new release areas, a higher density of houses might preserve land, but if the developments remain car dependent or fail to incorporate energy and water efficiency provisions, sustainability gains are modest. Planning policies linking new development to public transport, and urban design configurations and requirements to promote walking and cycling are important tools in ensuring that new developments genuinely contribute to sustainability and reduce greenhouse gas emissions.

Development requirements play an important role in achieving sustainability in building design. Mandatory requirements for climate sensitive building designs to reduce energy demand and for energy efficient domestic appliances provide an example of this approach (Low et al., 2005; Department of Planning, 2007). Other approaches might be the compulsory installation of water collection, and recycling and efficiency measures for individual dwellings or buildings (Kay et al., 2004). The planting of endogenous (locally occurring) species can reduce water demands while also contributing to local biodiversity (Fallding et al., 2001). At the neighbourhood or precinct scale, Water Sensitive Urban Design approaches combine water collection and management approaches to reduce demand and the need for new water supply and treatment facilities (Kay et al., 2004; McManus, 2005).

Specific development controls for waste minimisation and management are an important component of the mix. Plans can articulate objectives and requirements to maximise reuse and recycling of building materials, to minimise waste during construction, as well as requirements for

ongoing waste management, such as waste storage and recycling arrangements (McManus, 2005).

There is an international movement towards securing resource requirements (food, water, and other essential products) from within a local or region, while also managing waste within the same catchment (Beatley, 1995; 2004). Regulations that retain spaces for essential production and waste reuse/recycling in new development areas, or seek to preserve areas of agricultural production within and surrounding urban peripheries are examples of concrete planning measures to implement these goals.

Planning for climate change

All of these approaches can help communities include climate change considerations in plan making when specific developments are assessed (ODPM, 2004; Department for Communities and Local Government, 2007). The main issues relate to ‘mitigating’ contributions to climate change arising from carbon emissions (Rogner et al., 2007). Planning provisions designed to reduce reliance on non-renewable sources of energy and decrease car dependency are examples of approaches that can mitigate climate change contributions (Ewing et al., 2007). Sometimes more specific assessment criteria are needed to help evaluate the potential impact of major development that could have a considerable impact on carbon emissions either within the local area or ‘downstream’.

Planning provisions may also be needed to strengthen the capacity of communities to ‘adapt’ to the consequences of climate change that are already underway (Holper et al., 2006; Hennessy et al., 2007). For instance, design and building standards may be inadequate for the hotter temperatures, increased likelihood of bushfires, and more frequent or intense storms and floods that are anticipated under medium-term climate change scenarios (NSW Greenhouse Office, 2005).

Meaningful community involvement in decision-making is a fundamental tenet of sustainability (WCED, 1990). In addition to engaging local stakeholders in decisions, it is also important to consider Indigenous input to land use planning and environmental management,

respecting any ongoing custodian obligations and traditional resource access rights (Baker et al., 2001).

This section has outlined the basic tools for promoting sustainability through land use planning including objectives, land use control, development standards, conditions of planning approval, and, of course, refusal of inappropriate developments. Despite growing awareness of the importance of improving the environmental performance of cities and regions through biodiversity conservation, sustainable urban form and design, and climate change preparedness, little is known about the extent to which Australian land use plans address such issues. The following section outlines a methodology for unlocking this information.

The Australian Urban Land Use Planning Policy Survey

Interest in the extent to which local authorities are planning for emerging global policy concerns, particularly environmental issues and climate change, has inspired exploratory internet based survey research both within Australia and in the United Kingdom (ALGA, 2005; TCPA, 2006). The Australian Land Use Planning Policy Survey was developed by researchers at the Universities of Sydney and Western Sydney, with reference to these studies, although jurisdictional differences necessitated different approaches to question design and content. Administration of the survey was through a questionnaire for online self completion by professional planners. The questionnaire is based on statutory plan content, so can also be completed by research assistants with planning qualifications, ultimately enabling a complete database to be constructed. In contrast to previous plan surveys, the Australian Land Use Planning Policy Survey has been designed to enable continual updating of base data and periodic enhancement to gather new data on additional areas of planning policy.

It is intended that all of the 670 plus local government areas in Australia will ultimately be included in a database known as the Australian Land Use Planning Policy Monitor. Local government amalgamations and differences in the planning responsibilities of local governments in the Australian Territories means that the total number of local jurisdictions needed for completion of the data set will change over time. The database combines both local planner respondent and research assistant survey return. A comprehensive approach is important because of the

need to establish a deep reservoir of data on Australian land use planning policy, given the current absence of any such information.

The development of the Australian Land Use Planning Policy Survey required a valid questionnaire able to capture the various planning approaches employed across the diversity of state and territory jurisdictions and local authorities in Australia. A tight focus was needed for the first application of the survey to avoid it becoming too lengthy.

The questionnaire (which can be viewed at: <http://ppm.arch.usyd.edu.au>) uses a matrix design to group planning techniques and policy areas. It enables detailed data collection within a relatively short (six screen) internet survey taking between 10–20 minutes to complete for planners familiar with the controls within their own planning jurisdictions. Most questions enabled simple radio button check box responses, and there are two optional opportunities for open-ended responses. Principles of internet survey design (including appearance, format and question order, restricted access to avoid multiple responses or responses from those beyond the target sample, and testing across different browsers) were employed (Burkey and Kuechler, 2003).

After a pilot in late April 2007, the first round of the survey was administered online between May and August 2007, with one follow-up email. University ethics requirements dictated a specific sampling protocol which required an initial approach to be made to General Managers by mail, with a request that they pass on the information about the survey to the relevant planning officers. Following this, we sent two follow-up emails to council staff although we were unable to directly initiate communication with the professional planners, the intended survey participants. Publicity about the survey was achieved through notices in planning institute and local government newsletters, and it appears that many participants learned about the survey in this way. General Managers were encouraged to seek staff participation in the survey by offering free customised access to the database, featuring their local government area responses in relation to other councils.

This approach has yielded 76 local government area participants to date, a response rate of approximately 11 per cent. Response rates for internet administered surveys have not yet been established with assurance (Burkey and Kuechler, 2003; Iraguen and Ortuzar, 2003). In this case,

non-response is hypothesised to relate to the difficulty of directly targeting the relevant planning officer within council and a current climate of planning scheme reform across the jurisdictions (although it was emphasised that the survey will be updated biannually to track changes to planning control). Of the respondents, 32 were from metropolitan areas and 44 from regional cities and towns. It might be hypothesised that local government areas with stronger sustainability agendas and records of innovation would be over-represented amongst respondents. However, an analysis of actual respondents did not necessarily support this assumption, particularly given the higher number of respondents from non-metropolitan locations, where resources and capacity for innovation is often limited.

An additional 53 questionnaires were undertaken by research assistants, to reach a target of 20% coverage of Australian local government areas for initial analysis. Both the primary survey and the survey completed by research assistants are administered online, enabling automatic data collation. The overall interim sample size of 129 local government areas is associated with confidence rating of results at +/- 10%. This limits the extent to which wider generalisations can be made in analysing the survey results, particularly where results are equivocal. However, as demonstrated below, clear trends are apparent in relation to most questions, improving confidence in broad findings and trends.

The survey instrument covers actual and draft plan approaches, to gain an accurate indication of existing and emerging practice. However, only local government respondents are able to answer questions relating to draft plans or other local or state policies applying to their area, so the complete data set (including responses collected by administrative assistants) relates only to the main statutory land use planning instrument for each local jurisdiction. Both data sets (full survey responses returned by local planners and questionnaires completed by research assistants with professional planning expertise) are maintained separately, but able to be analysed as a combined sample in relation to questions focusing on the primary planning instrument.

Key issues in terms of the validity of the research are the reliability of the measurement tool (i.e. the questionnaire) and the reliability of responses. The reliability of the questionnaire depends on accurate conceptualisation of the range of Australian planning techniques, so in

addition to the researchers' previous research on the spectrum of planning approaches to environmental sustainability and housing (Gurran, 2003; Gurran et. al., 2006), the development of the survey involved content analysis of a cross-section of five planning instruments from each Australian jurisdiction. Professional input through a small professional reference group, including alumni from the University of Sydney planning program and the professional board of the University's Planning Research Centre, substantiated the interpretation of key planning approaches and the transferability of categories across jurisdictions. This group verified the validity and reliability of the survey.

Web-based survey administration enables interaction in ways that are similar to a face-to-face survey, through the use of pop up explanations of terms and questions. This is associated with less potential for respondent error and item non-response (where a participant chooses not to answer a specific question) (Burkey and Kuechler, 2003; Iraguen and Ortuzar, 2003). With reference to the reliability of responses, as local planners have professional responsibility for the planning instruments they are referring to, their knowledge is expected to be accurate. The potential for a dishonest response, or asserting the existence of a particular local approach when none has been implemented, is minor because the survey deals with statutory instruments that are publicly available.

Further information about the survey questions and rationale for their inclusion is contained in the following section, which presents the interim results of the survey. It focuses firstly on questions regarding sustainable urban form, secondly, on questions relating to biodiversity conservation, and thirdly, questions relating to climate change adaptation and mitigation.

Planning for urban form in Australia

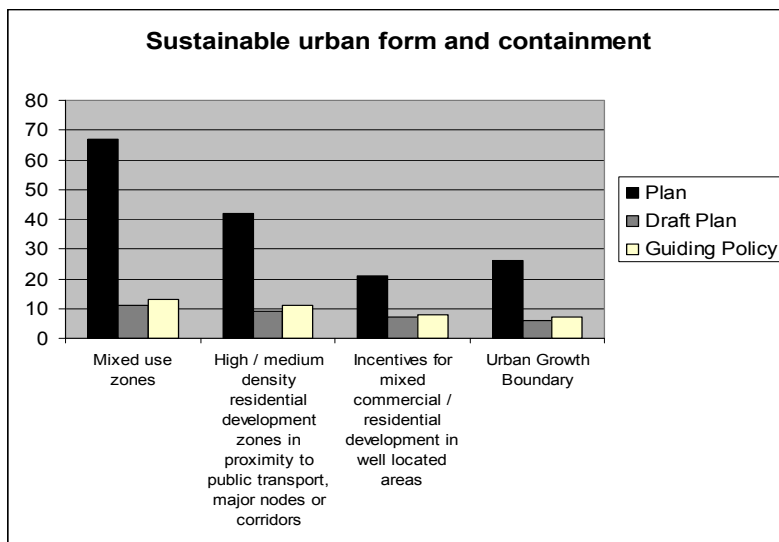
The survey includes a number of questions concerning approaches to sustainable urban form, including provision for mixed use zones; higher density surrounding public transport or services; provisions for footpaths, bicycle paths and facilities; reduced parking requirements near public transport; energy, water efficiency and sustainable waste management controls. Questions about specific mechanisms to manage

Figure 30: Survey questions about sustainable urban form

Sub-question regarding plan & policy content	Explanation
Mixed use zones	Reduces separation of functions & need for motor journeys
High/medium density residential development zones in proximity to public transport, major nodes or corridors	Reduces car dependence
Incentives for mixed commercial/residential development in well located areas	Reduces separation of functions & need for motor journeys
Requirements for bicycle paths/dedicated lanes for new subdivisions or other applicable developments	Promotes cycling as an alternative to motor journeys
Requirements for bicycle facilities in employment buildings	Promotes cycling to work
Requirements for footpaths/walkways in new subdivisions or other applicable developments	Enables pedestrian journeys to reduce car dependence and promote public health
Reduced parking requirements for applicable developments in areas near public transport	Promotes public transport use
Requirements for passive energy use/energy savings in the design of buildings	Reduces carbon impact of development
Requirements for water saving approaches	Reduces domestic water use, lowers demand for potable water supply
Requirements for water sensitive urban design in new subdivisions/redevelopment areas	Reduces need for major new water infrastructure, promotes water conservation
Requirements for waste minimisation strategies in the construction and operation of new developments	Reduces need for new carbon producing land fill; promotes sustainable reuse of materials and resource recovery
Urban Growth Boundary	Technique for limiting urban expansion
Green building criteria/performance targets	Flexible technique for promoting sustainable building design

growth or to require sustainability features in new development, including urban growth boundaries, and green building criteria were also asked. Figure 30 outlines and explains each of the sub-questions relating to sustainable urban form. Respondents were asked to indicate whether the provision is contained within their principal statutory land use plan, a draft plan, guiding policy, draft guiding policy, or covered by state policy. Multiple responses are permissible by local government respondents, although as noted the data set collected by research assistants focuses only on the primary plan itself.

Figure 31: Approaches to sustainable urban form and containment



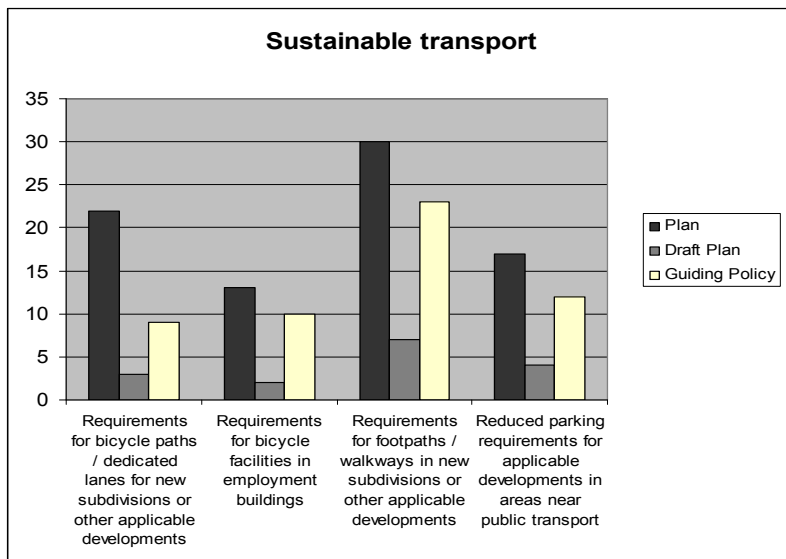
Source: Gurrin and Phibbs (2008). N=129.

Sustainable urban form and containment

The most common approach for promoting sustainable urban form is to encourage mixed use areas through land use zones or equivalent categories, enabling a range of residential and commercial activities. Although this was anticipated to be a standard measure across Australian plans, in fact it was contained in just over half (67) of the 129 plans

sampled (Figure 31). This may be explained by the higher number of regional cities and towns represented in the sample (78) as compared to metropolitan areas (51), reflecting the higher number of non-metropolitan government units in Australia overall. The smaller proportion of metropolitan areas in the sample might explain why only a third of the sample actively promote high or medium density residential development close to public transport. The final two mechanisms shown in the graph, incentives for mixed development and urban growth boundaries, are applied by 21 and 26 local government areas respectively, although there is no particular reason why these tools should be confined to metropolitan areas.

Figure 32: Planning levers for sustainable transportation



Source: Gurrán and Phibbs (2008), N=129.

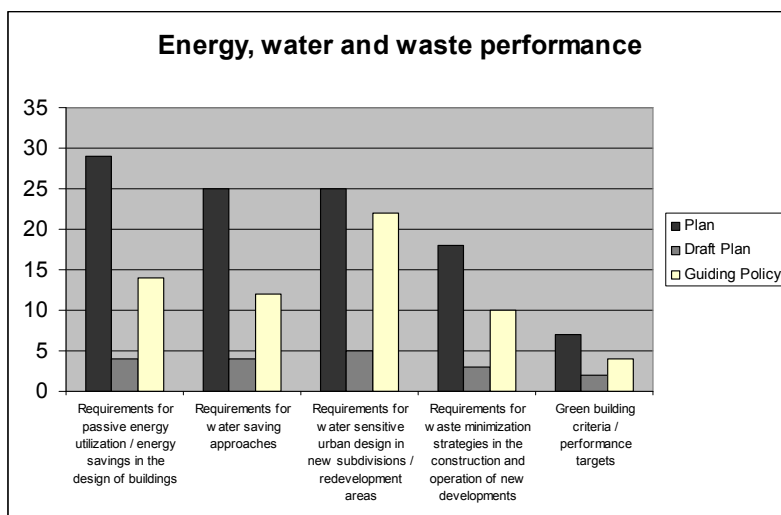
Sustainable transportation

Although there is a high level of policy emphasis in Australia on the need to promote sustainable transportation and reduce car dependency

(e.g., Newman and Kenworthy, 1999; Transport NSW et al., 2001), the interim results of our study suggest that the use of planning mechanisms to achieve these goals is relatively limited. Only 30 plans surveyed actually require footpaths or walkways to be included in new subdivisions or other applicable developments, and an additional 23 of the local government area respondents indicate that provision for footpaths is addressed by guiding policy (Figure 32). It may be assumed that footpaths or walkways may be a matter for negotiation in the other local jurisdictions but the absence of statutory requirements or formal policy is a matter of concern.

A mere 17 of the plans included in the sample have adjusted their car parking requirements for developments located in proximity to public transport. Similarly, only a fifth of plans in the sample (22) include specific requirements for bicycle paths or dedicated lands in new subdivisions.

Figure 33: Energy, water and waste performance



Source: Gurran and Phibbs (2008). N=129.

Energy, water and waste measures

Despite increasing emphasis on the need for energy efficient and climate appropriate building design in Australian planning, only a quarter of the plans sampled include requirements for passive energy utilisation or energy savings in the design of buildings (Figure 33). Results for water conservation were even lower, with only 25 plans including requirements for water saving approaches and water sensitive urban design measures in new development or redevelopment areas. Eighteen of the plans sampled include specific requirements to minimise waste in the construction and operation of new development.

Some local government respondents, particularly those in NSW, indicated that energy and water savings requirements are addressed by state policy under the State Environmental Planning Policy – Building Sustainability Index (BASIX) (see DOP, 2007). Seven plans include environmental or ‘green’ performance criteria, while 12 local government respondents indicated that this approach was achieved through state policy, and again the majority of these were from NSW.

Planning for biodiversity conservation in Australia

Approaches to biodiversity conservation in local plans are measured by the inclusion of specific measures to protect important biodiversity, like wildlife habitat, wetlands, native vegetation, catchments, coastal features and processes, and the interface between protected natural areas and surrounding lands. A set of sub-questions address the specific tools or environmental offsets to promote biodiversity protection outlined above, including provisions for tradable development rights, clustering on less sensitive areas of environmentally significant sites, population caps linked to environmental carrying capacity, and incentives for voluntary conservation agreements, which can all be effective inducements to biodiversity conservation – see

Figure 34 (Gurran, 2007; Noosa Shire Council, 2004). A series of sub-questions also focus on direct approaches to mitigate contributions to climate change, and provisions to promote adaptation to changed climatic conditions, including vulnerability to bushfire (Figure 35).

Figure 34: Survey questions about biodiversity conservation

Sub-question regarding plan and policy content	Explanation
Requirements for retention of/planting of endogenous species in sensitive areas	Enhances local biodiversity and avoids intrusion by exotic species
Protect wildlife habitat, wetlands, native vegetation, catchment values, landscape values, coastal features/processes	Specific tools – zones, overlays, development prohibitions, special assessment requirements, or referrals needed to ensure protection of these attributes
Manage interface between protected natural areas and surrounding lands	Interface controls or mechanisms to reduce potential conflicts between protected areas and neighbouring lands, such as the spread of exotic species, fire, visual degradation, and adjacent habitat loss

Figure 35: Survey questions about environmental tools/offsets

Sub-question regarding plan and policy content	Explanation
Environmental offsets/trade-offs	Incentive to enable development while achieving overall net environmental benefit
Tradable development rights	Enables compensation for removal of development rights in areas where development no longer appropriate
Clustering on less sensitive areas of environmentally significant sites	Enables reasonable development without compromising overall environmental integrity
Population cap	Allocates land for new urban development according to environmental capacity of local area
Incentives for conservation agreements	Encourages land holders to voluntarily conserve land

Figure 36: Survey questions about climate change

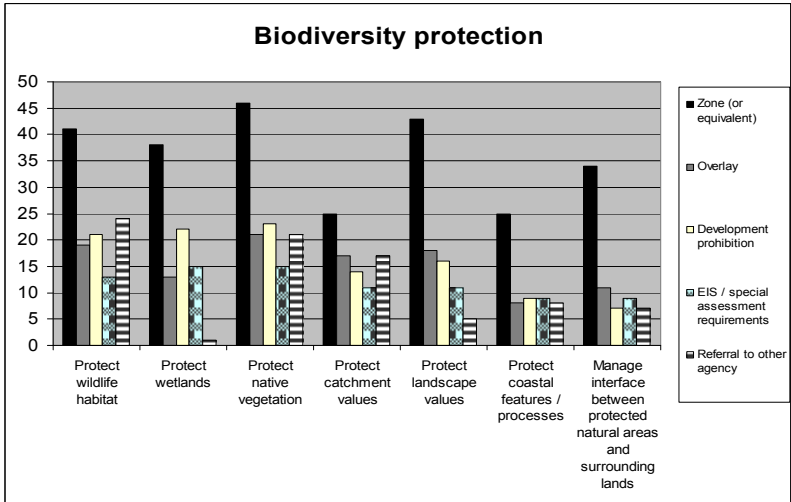
Sub-question regarding plan and policy content	Explanation
Climate change adaptation provisions (zones, zone objectives, overlays, development prohibitions, or special assessment requirements)	Specific mechanisms or objectives within goals to consider the need to adapt to future climate change impacts increasingly required as an important element of local planning, particularly in coastal areas
Climate change mitigation provisions	Ensures that planning authorities consider the carbon impact of new development
Reducing vulnerability to bushfire provisions	Land use plans need to consider potential for increased bushfire risk associated with climate change

Many of the questions relating to biodiversity conservation were tagged to a range of possible planning mechanisms, including zones or equivalent, mapped overlays (which introduce additional requirements), development prohibition, environmental impact assessment or other special assessment requirements, referral to other agencies for their views or endorsement, or other non-specified approaches. Respondents were also asked to indicate whether the issue is addressed through guiding local policy or via state policy requirements. Again, multiple responses were accepted.

Biodiversity protection

Zones or equivalent land use categories are the most common tool used by Australian local governments to protect biodiversity, including wildlife habitat, wetlands, native vegetation, catchment, landscape values, and coastal features. Although less than half of all plans sampled include such measures (Figure 37), inclusion also relates to the environmental features of the local government area, so many are unlikely to be used in metropolitan locations. Exceptions include metropolitan locations containing or adjoining national parks or reserves. Over a quarter of the plans sampled include specific zones or equivalent to protect the interface between these protected areas and adjacent land uses.

Figure 37: Biodiversity protection



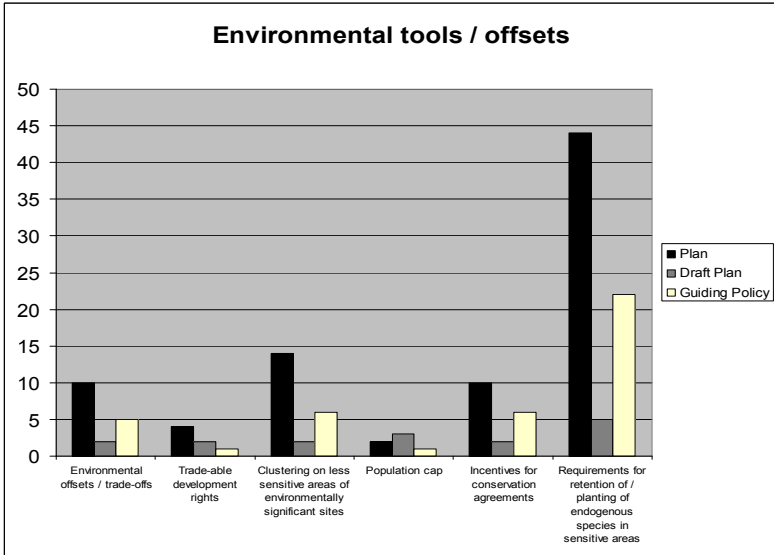
Source: *Gurran and Phibbs (2008)*. N=129.

Other approaches to biodiversity protection include referral to other agencies (particularly common for wildlife habitat, protecting vegetation, and catchment values). Many of the local government areas with planning provisions in place actually prohibit development that may affect wildlife habitat, wetlands, native vegetation or landscape values.

Environmental tools/offsets

The use of environmental tools or offset approaches is relatively limited across the plans included in the sample. As such approaches are regarded to be innovative, and may face legislative barriers in some jurisdictions, these results were not surprising. Indeed, the fact that a small but not insignificant number of plans across Australia do contain provisions for environmental offsets (10 plans), clustering (14 plans), incentives for conservation agreements (10 plans), and requirements for the retention of or planting of endogenous species (44 plans) demonstrates that such tools are feasible, depending on legal and resource constraints within specific local government areas.

Figure 38: Environmental tools / offsets

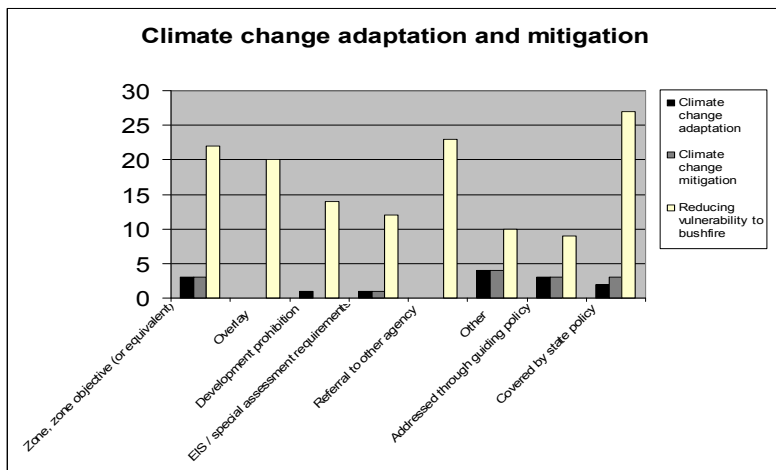


Source: Gurran and Phibbs (2008), N=129.

Climate change mitigation and adaptation

Broader provisions in Australian plans for climate change mitigation through sustainable urban form and building design were outlined above, noting surprisingly limited evidence of tangible planning requirements to achieve these goals. As shown in Figure 39 below, the extent to which climate change has been specifically included in Australian local plans appears extremely limited. Only three local plans refer to climate change mitigation or adaptation as a consideration when assessing development. Several respondents referred to state government requirements in South Australia (provisions for considering sea level rise), but none of the other states were identified by local government participants as promoting specific planning requirements relating to climate change.

Figure 39: Climate change adaptation and mitigation



Source: Gurrán and Phibbs (2008). N=129.

Provisions for bushfire protection is an important consideration in reducing community vulnerability to climate change, though not always recognised as such. Less than a quarter of plans include specific provisions for reducing vulnerability to bushfire, of which 22 use zones or equivalent, 20 use overlay mechanisms, and 23 require referral to another agency. Twenty seven local government respondents (across all of the jurisdictions) report that bushfire protection is addressed by state policy.

Conclusions

The interim results of this national survey of Australian land use plans demonstrates that knowledge of sustainable planning approaches exists in a considerable number of local government areas but that actual implementation of such approaches is limited. It may be difficult to transform pre-existing development control frameworks. Nevertheless, the fact that between a quarter to half of local authorities surveyed have implemented approaches for urban containment, energy and water efficiency, waste minimisation or biodiversity conservation within their

plans demonstrates models for broader application across other local jurisdictions. Promoting such practice more widely across Australian local planning authorities will require education and information sharing strategies to promote awareness of existing models and approaches. The Australian Urban Land Use Planning Policy Monitor is intended to contribute to this goal. The act of completing the survey itself exposes practitioners (and planning students) to the range of potential approaches to sustainability planning. When the database is complete, more detailed research on the impacts of sustainable planning policies will be possible by drawing on other data sources available at local government area scale. For instance, the influence of sustainable transport policies will be able to be tracked over time against journey to work data from the census.

Strong state and territorial policy directions and requirements (particularly in relation to climate change mitigation and adaptation), dedicated resources to local government to assist in planning reform and innovation, and effective consultation processes are needed to build political and industry support for such models. It may also be necessary to remove legal barriers to innovative planning tools, for local authorities able to demonstrate effective models for environmental incentives and offsets that result in net benefits for local biodiversity. Such action must take place immediately, as environmental challenges – from biodiversity loss to global climatic change – are gathering pace. A rapid and widespread transformation in existing planning frameworks is needed if Australian local governments and communities are to successfully adapt to these impending challenges.

References

- Australian Local Government Association (ALGA) (2005) *Survey of coastal councils*. Canberra: ALGA.
- Baker, R., Davies, J., and Young, E. (2001) 'Managing country: an overview of the prime issues,' in R. Baker, J. Davies and E. Young (eds.), *Working on country: contemporary indigenous management of Australia's lands and coastal regions*. Melbourne: Oxford University Press.
- Beatley, T. (1995) 'Planning and sustainability: the elements of a new (improved?) paradigm.' *Journal of Planning Literature*. 9(4): pp. 383–395.
- Beatley, T. (2004) *Native to nowhere: sustaining home and community in a global age*. Washington DC: Island Press.
- Beatley, T. and Manning, K. (1997) *The ecology of place planning for environment, economy and community*. Washington DC: Island Press.
- Burkey, J. and Kuechler, W. (2003) 'Web-based surveys for corporate information gathering: a bias-reducing design framework.' *IEEE Transactions on Professional Communication*. 46(2): pp. 81–93.
- Commonwealth of Australia (1992) *National strategy for environmentally sustainable development*. Canberra: available at <http://www.environment.gov.au/esd/national/nscsd/strategy/index.html> (consulted 11th December 2007).
- Department of Communities and Local Government (2007) *Planning policy statement: planning and climate change. supplement to planning policy statement 1* available at <http://www.communities.gov.uk/publications/planningandbuilding/ppsclimatechange>.
- Department of Planning (DOP) (2007) *BASIX fact sheet*. Available at www.sustainability.nsw.gov.au/information (consulted 12th June 2007).
- Dyck, R. (1998) 'Integrating planning and sustainability theory for local benefit.' *Local Environment*. 3(1): pp. 27–43.
- Ewing, R., Bartholomew, K., Winkelmann, S., Walters, J. and Chen, D. (2007) *Growing cooler: evidence on urban development and climate change*. Urban Land Institute available at <http://dnr.wi.gov/environment/protect/gtfgw/documents/GrowingCoolerEs.pdf> (consulted 3rd March 2008).

- Fallding, M., Kelly, A. Bateson, P. and Donovan, I. (2001) *Biodiversity guide for NSW local government*. Hurstville: NSW National Parks and Wildlife Service (NPWS).
- Gurran, N. (2003) 'Housing locally: positioning Australian local government housing for a new century.' *Urban Policy and Research*. 21(4): pp. 393–412.
- Gurran, N. (2007) *Australian urban land use planning: introducing statutory planning practice in New South Wales*. Sydney: Sydney University Press.
- Gurran, N. and Phibbs P. (2008) *Australian urban land use planning policy monitor interim data May 2008*. Unpublished data report strip available at <http://ppm.usyd.edu.au>.
- Gurran, N., Squires, C., Blakely, E. (2006) *Meeting the sea change challenge: best practice models of local and regional planning for sea change communities*. Report for the National Sea Change Task Force. Sydney: University of Sydney, Planning Research Centre.
- Hennessy, K. B., Fitzharris, B. C., Bates, N., Harvey, S. M., Howden, L., Hughes, J., Salinger, J. and Warrick, R. (2007) *Australia and New Zealand, climate change 2007: impacts, adaptation and vulnerability*. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change in M. L. Parry, O. L. Canzaiani, J. P. Palutikof, P. J. ven der Linden and C. E. Hanson (eds.). Cambridge: Cambridge University Press. pp. 507–540.
- Holloway, D. and Bunker, R. (2006) 'Planning, housing and energy use: a review.' *Urban Policy and Research*. 24(1): pp. 115–126.
- Holper, P., Nolan, L. S., Senese, M. and Hennessy, K. (2006) *Infrastructure and climate change: Risk assessment for Victoria*. Victoria: CSRIO.
- Iraguen, P. and de Dios Ortúzar, J. (2003) 'Willingness-to-pay for reducing fatal accident risk in urban areas: an Internet based web page stated preference survey.' *Accident Analysis and Prevention*. 36(4): pp. 513–524.
- Kay, E., Wong, T., Johnstone, P. and Walsh, G. (2004) *Delivering water sensitive urban design through the planning system*. Available at www.wsud.org/downloads (consulted 12th June 2007).
- Low, N., Gleeson, B., Green, R. and Radovic, D. (2005) *The green city: sustainable homes, sustainable suburbs*. Sydney: UNSW Press.

- McManus, P. (2005) *Vortex cities to sustainable cities: Australia's urban challenge*. Sydney: UNSW Press.
- Newman, P. (2006) 'Sustainable transport for sustainable cities.' *Issues*. vol. 76: pp. 6–10.
- Newman, P. and Kenworthy, J. (1999) *Sustainability and cities: overcoming automobile dependence*. Washington DC: Island Press.
- Noosa Shire Council (2004) *Population carrying capacity in Noosa Shire*. Noosa: Noosa Shire Council.
- NSW Greenhouse Office (2005) *NSW greenhouse plan*. Available at http://www.greenhouse.nsw.gov.au/___data/assets/pdf_file/0016/2662/28-11_FINAL_NSW_GH_Plan_web.pdf.
- NSW National Parks and Wildlife Service (NPWS) (1999) *NSW biodiversity strategy*. Hurstville: NPWS.
- Office of the Deputy Prime Minister (ODPM) (2004) *The Planning response to climate change: advice on better practice*. London: Office of the Deputy Prime Minister.
- Rogner, H. H., Zhou, D., Bradley, R., Crabbe, P., Edenhofer, O., Hare, B., Kuijpers, L. and Yamaguchi, M. (2007) 'Introduction,' in *Climate Change 2007: mitigation*. Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. B. Metz, O.R. Davidson, P. R. Bosch, R. Dave and L. A. Meyer (eds.). Cambridge: Cambridge University Press.
- Town and Country Planning Association (TCPA) (2006) *Survey of local authorities: planning for on-site renewable energy and sustainable construction*. London: TCPA.
- Transport NSW, Roads and Traffic Authority and Department of Urban Affairs and Planning (2001) *Integrating land use and transport: improving transport choice – guidelines for planning and development*. Sydney: NSW Department of Urban Affairs and Planning.
- Troy, P. (1990) *The perils of urban consolidation: a discussion of Australian housing and urban development policies*. Annandale: The Federation Press.
- Williams, K., Burton, E. and Jenks, M. (2000) *Achieving sustainable urban form*. London: F & N Spoon.
- World Commission on Environment and Development (WCED) (1987) *Our common future*. New York: Oxford University Press.