



ACT STATE OF THE ENVIRONMENT REPORT 2011

PROGRESSING SUSTAINABILITY

Introduction

Concern for the environment and a desire to live more sustainably has become widespread internationally and is also evident locally in the ACT. Yet, considerable uncertainty exists regarding the meaning of these terms, the main challenges faced and the improvements that can be made to the current situation in order to move towards a more sustainable future.

Much of the contemporary thinking about environmental sustainability is based on the landmark report, *Our Common Future* (WCED 1987:43), which describes sustainable development as that which would meet present needs without compromising the ability of future generations to meet theirs. Central to this view of sustainability is a concern for social justice and equity within and between generations. The inherent uncertainty around our ability to precisely predict future scenarios, the changing character of social organisation and technology, and the potential to meet our current and future needs are also central considerations.

As in other situations where indications are clear but knowledge incomplete, applying the precautionary principle is necessary. Key aspects to consider, therefore, in assessing sustainability and taking actions for its enhancement are: resource depletion and degradation; pollution and wastes; ecological services that support all life; and a range of economic and socio-political issues (Dovers 2005:9).

This paper places the outcomes of the State of the Environment Report (SoER) into a wider sustainability framework and provides information for decision makers and the community on the key challenges and opportunities for progressing sustainability in the ACT.



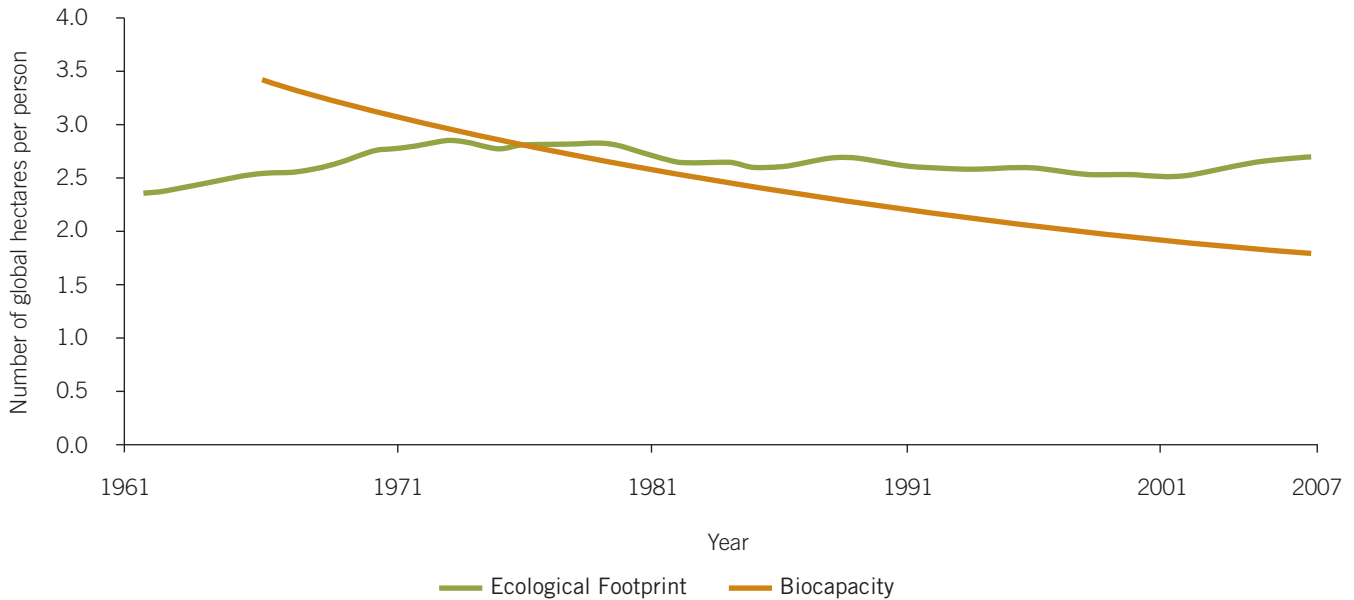
Source: ACT Government

Sustainability in the global context

We are part of an interconnected world and contribute to, and are affected by, emerging global trends. Globally, the area of land needed to support our lifestyles (ecological footprint) is exceeding the area of biologically productive land and water on earth available to meet the needs of human populations (biocapacity), which has continued to decline markedly over the past 50 years (Figure 1). The rate of consumption is not evenly spread across the globe, with high-income countries such as Australia having a footprint five times that of low-income countries (WWF 2010). The global carbon footprint (CO₂ emitted from fossil fuel consumption) has increased by over 30% since 1998, and now accounts for over half the ecological footprint (WWF 2010).



Figure 1. Changes in the global ecological footprint and the biocapacity available per person worldwide between 1961 and 2007



Source: Adapted from WWF 2010

Commonly discussed pressures in recent times are the predicted changes that are likely to accompany climate change, the uncertainties of transitioning to alternative fuel supplies and sources of renewable energy, and global economic uncertainty. Other key global drivers that may impact on the ACT and Region include (Cork, 2011):

- changing international trade patterns and agreements;
- global power shifts in the Asia-Pacific region;
- shortages of water in many countries and associated shortages of food;
- a growing rich-poor divide and increasing inequity; and
- political change and unrest in many developed and developing countries, often arising from combinations of local and global change.

While these pressures may challenge efforts to achieve heightened sustainability, locally and nationally, other aspects of globalisation offer opportunities for progress. International and local actions are becoming increasingly interconnected through electronic media and the internet. Efforts are underway, using these technologies, to raise awareness, provide access to information, connect like-minded people and enable collaboration across disparate fields to undertake research, teaching, planning and practical projects to enhance sustainability in many different ways (see *Sustainability Stories*).



The challenge we face – sustainability locally

The *Time to Talk: Canberra 2030* (ACT Government, 2010) community consultation found that most Canberrans want a green and sustainable city that limits urban sprawl. We are a highly urbanised population residing in a city, ranked as one of the top 30 cities worldwide for its liveability, water quality and availability, waste removal, air pollution and congestion (Mercer Worldwide Quality of Living Survey 2010), where we enjoy extensive green space within and around the city. Further, we experience very little industrial pollution as we import most of our consumer goods and services from interstate and overseas. Yet the ACT is facing many challenges in maintaining its urban quality and increasing its sustainability into the future. Ironically, it may be that the very liveability of the city is making it more difficult for Canberrans to associate their increasingly urban lifestyle with degradation of the natural environment, which determines our high quality of life and consumption.

The ACT's population and economy are continuing to grow with increasing levels of affluence, accompanied by urban expansion and an increased ecological footprint. Population demographics and the ways people interact in the ACT and Region are also changing and affecting how the region functions, particularly in transport patterns and housing and service requirements. All these changes have direct environmental impacts, resulting in land degradation, vegetation clearing, habitat loss, water quality impacts and increased run-off.



Source: ACT Government

Many Canberrans are involved in addressing local impacts on the immediate environment (for example, in efforts to control pollution and protect ecosystems) but are less focused on addressing the Driving Forces, such as consumption, that create those impacts. This is reflected in the increasing size of our ecological footprint, which has grown by 8% in five years and nearly 25% in 10 years. It is now 9.2 global hectares – 13% above the Australian average and nearly 3.5 times the global average. If we were to have our fair share of the total global hectares (gha) available, we would have reduced our footprint to 1.8 gha per person.

This increase in our ecological footprint is linked to the growth in our urban footprint and our high levels of consumption. This in turn puts increased pressure on the local and wider environment. Our heavy reliance on motor vehicles is still trending upwards and, consequently, our greenhouse gas emissions are continuing to grow (by about 7% between 2005 and 2009). Waste generation increased by 34.7% (from 2007–08 to 2010–11) and the city boundary is further expanding as a result of the predominant share of greenfield development (72% over the reporting period).

Although local actions and policy measures are crucial for local environmental health and sustainability, the well-known adage of think globally/act locally needs reconsidering. The interconnectedness of every aspect of the environment at all scales from local to global, and our interdependence regionally, nationally and internationally, has become even more apparent. Achieving enhanced sustainability requires actions across all these scales. For the ACT, working with regional, NSW and national partners is particularly important. These 'cross-border' issues are diverse, existing in and across all the themes explored in this report. Some examples of such issues are:

- Over 98% of the ACT's stationary energy is generated in NSW, while much of the region's strongest potential for renewable energy, such as wind power, lies in surrounding areas outside the ACT.
- Free parking in the Parliamentary triangle, which provides a significant incentive for a large proportion of the 65,000 commonwealth public servants to drive and reduces the appeal of more sustainable public and active transport options. 20,000 NSW residents commute to work in the ACT daily (ACT Government 2010), the vast majority, by car.
- The ACT's water supplies feed into the Murray-Darling Basin, with large areas of our catchments located within NSW.



Emerging Issues

One of the challenges in planning and acting to progress sustainability is that change is constant, but our capacity to foresee the future is quite limited. In the ACT and Region, population growth and demographic and technological changes are affecting how and where we live. In particular, changes in household structure and expectations about the provision of services are modifying accommodation, recreation, consumption and employment needs, as well as travel options between the locations of these activities.

As a way of anticipating future directions, the Office of the Commissioner for Sustainability and the Environment (OCSE) undertook a series of horizon scanning workshops focusing on sustainability and environmental issues that are likely to have a significant impact on the ACT and Region. The workshops generated thoughtful dialogue by participants drawn from many different sectors of the community. Participant contributions were incorporated into a Report, Environmental Scan – Issues for Future Sustainability and Environmental Management in the ACT and Region (Cork, 2011). A wide array of ideas and questions about possible futures and issues were generated and included some ideas, such as moving the seat of government from Canberra, creating artificial meat, or needing to accommodate mass migrations of climate refugees, that seem unlikely to materialise. However being prepared for some of the otherwise unexpected futures can help us, as a community, to take action now and into the future.

Resource limitations

Factors including population growth, changing demographics, lifestyles and the extent and nature of urban development have clear connections with our future use of water and energy. Responding to these factors as well as managing sources and limitations of energy and water supplies will shape future urban development and lifestyles in the ACT and Region in the next few decades (Cork 2011).

The ACT and Region face particular challenges due to their relatively high dependence on fossil fuels, both for the generation of our electricity and fuelling motor vehicles, on which we are so reliant. Further, with the breaking of the recent drought, the move to water conservation measures, rather than restrictions along with new water supply options, may lead the ACT and regional communities to become complacent about water use. In the face of population growth, there are major challenges in transitioning to new sources of energy, addressing water supply limitation, and taking action to mitigate and adapt to the impacts of climate change. However, with an already growing renewable energy sector in the Region, these challenges also present opportunities (Cork 2011). For instance, the emergence of local renewable energy businesses may positively affect the growth and distribution of urban populations and their impacts on the natural environment.

Health and wellbeing

Many emerging health issues are linked to our modern, largely urban, lifestyles. Increasing rates of obesity (ACT Government 2010), for instance, are in part associated with sedentary lifestyles and reliance on cars, while respiratory problems are being linked with urban air quality (AIHW 2011). Further, declining mental health, particularly in young people, results in growing social and economic costs (Cork, 2011) and raises the question of whether we are doing enough to consider the mental health in city and regional planning.

Although these health issues present challenges for individuals and service providers, many of the solutions have co-benefits for both ecosystems and our personal and social wellbeing. Improving the sustainability of our city through initiatives that encourage locally-grown produce, active transport, recreational use of urban green space and good indoor and outdoor air quality will assist in offsetting a significant proportion of the perceived economic costs of related sustainability initiatives.



Source: ACT Government



While local factors are currently the most immediate concerns for public health and wellbeing, global environmental issues, such as climate change, present another level of emergent health problems, which also have impact at a local level. Clear examples are an increased risk from heat waves, bushfire and other results of predicted extreme weather events (Webb 2011). Integrating preventative health management with environmental change will be a key social challenge over the next century. Even in this case, we find that environmental and health benefits are interconnected. For example, urban adaptation measures, such as the development of green-roofs to reduce the urban heat island effect, not only provide environmental benefits, but also bring health benefits. It is therefore important to recognise a healthy environment that builds into preventive medicine, now and into the future.

Biodiversity

Many leading scientists are concerned that we face dramatic ecological collapses that will have a cascading or domino effect leading to social as well as ecological problems (Tierney, J. 2011 and Brown P.R. et al. 2010 cited in Cork 2011). Thus, continuing efforts in preservation, monitoring and advocacy regarding our local biodiversity, are vital areas for action. Horizon scanning participants noted that little attention has been paid in the ACT to less visible aspects of the natural environment, such as soils and insects, even though these areas are vital indicators of ecosystem change, in addition to their intrinsic value (Cork 2011). In addition to this, there is increasing evidence of a decline in general soil health, which in turn, is proving detrimental for overall biodiversity.

However, we are fortunate to have a strong base of committed community environmental groups and research organisations active in the ACT region, and as a society our attitudes and understanding of biodiversity will remain key drivers of its protection. Nonetheless, protection and enhancement of biodiversity as a whole, rather than activism for specific species, localities, or ecological communities remain a challenge, both in terms of community attitudes and advocacy, and government planning and practice. The need for a strategic approach to biodiversity protection was highlighted by horizon scanning participants too. Additionally, there is uncertainty around the capacity of our governance and community structures to anticipate and cope with the ecological crises that may occur, if our biodiversity is not adequately protected. Integration of urban and biodiversity planning into both existing and future infrastructure will be increasingly important, for example through fauna sensitive road design and water sensitive urban design.



Source: ACT Government

Urban design and transport

The way the city form is developed in response to population growth and changing demographics will have major implications for future sustainability. Policies and planning to encourage continuing efforts are central to shaping Canberra as a sustainable city into the future and enhancing community wellbeing. Well-planned urban densification, around city and town centres, that responds to changing community needs, is generally considered to be a more sustainable alternative to increasing our urban boundaries through greenfield development. Along with diverse housing forms, adequate open space and urban form that encourages reduced reliance on motor vehicles and provides easy access to essential services and recreational facilities are key elements of a sustainable city. This kind of development that values and protects remnant ecological communities at our urban fringe also offers health and wellbeing benefits to citizens. Further, it is a means to reducing the high-embodied energy levels that result from infrastructure and transport networks that are widely dispersed. As a result, if they are well designed, cities may be better for the environment than previously thought. Therefore, an important issue that arises is that whether the high level of green space can be capitalized upon by the ACT Government or whether it will be lost to meet the increasing demand for development.



Horizon scanning participants also discussed new forms of property ownership, which might emerge from the current challenge of housing affordability. Urban structure is important to how people meet and interact. In Canberra, as in many developed cities, there has been a major focus on retail places, which have become important meeting places (Cork 2011). This may become an issue in the future if there were a decline in consumerism and in the overall economy, as we would then need to provide alternative places for people to meet.

Technological change

Technological innovation and developments in communication are a source of emerging new information, which is likely to have far-reaching and unpredictable impacts. Horizon scanning participants highlighted the potential benefits of technology, including the flexibility it provides for people to live and work remotely and the opportunity to better engage the wider community in education, problem solving and decision making (Cork 2011). Such changes may affect the role Canberra plays in the region with a possible movement of people away from the ACT, which in turn may create infrastructure challenges, such as increased demand for better roads, water and internet access, for local councils. Therefore, a concern arises regarding changes that may need to take place in the ACT in response to the challenges posed by technological innovations.

Evidence indicates that the general community is adapting to change faster than governments. Developing technologies enables more efficient resource use, and more sustainable consumer choices, largely driven by community and the private sector. While such innovation often promises more efficient, market-driven solutions and information, it also presents a range of regulatory and social challenges that will have to be addressed, a process made more difficult by the uncertainty in and speed of the change occurring (Cork 2011).

Other emergent technologies such as hydrogen fuels and electric cars, may offer solutions to the environmental problems faced by the transport sector, but these options are likely to remain very expensive for a considerable time (Heuris Partners 2010). However, other innovative approaches are already being used to tackle food security issues with urban agriculture projects (such as growing food in abandoned buildings) and a new form of 'green revolution' including artificial foods is being discussed in a number of countries around the world (Cribb 2010 cited in Cork 2011). These technologies that are likely to arise in the future provide hope that humans may be able to change environmental processes, enabling 'improvements on nature'. However, potential outcomes of such actions bring with them another layer of uncertainty along with environmental and ethical questions, to name a few.

While technological innovation may offer ways of meeting future challenges, they also raise potential concerns such as new forms of pollution. For example, nano-silver which is used widely in the manufacture of air conditions, toys, vacuum cleaners, medical devices and the like, can enter the aquatic environment (Teuten et al. 2007 cited in Cork 2011). It can also affect the fertility of soil as well as impacting animal reproduction (Cork 2011). It is thus important to understand the impact that these and other pollutants will have on our environment in order to manage them.

Lifestyles and attitudes

Perhaps above all other factors, our natural and built environment will continue to be a product of our lifestyles and our attitudes to our environment. Our choices are influenced by our national political, economic, societal, technological and legal values and systems as well as our more personal family, friendship and other social connections (Pearson, 2011). One illustration is evident in our food choices where each decision about what is 'normal' is developed within this kind of network of connections. Therefore, this complexity needs to be taken into account when efforts to influence choices are being developed. For example if high priority is given to processed foods because of their convenience value, simply giving additional information that focuses on the high ecological impact of products, is unlikely to achieve the desired behavioural change (Pearson 2011).

To add to the complexity, attitudes and behaviours are reciprocally reinforcing; changes to lifestyles are influenced by attitudes but the reverse is also true. For example, changes in housing stock, energy sources and transport provision often have economic, behavioural and lifestyle impacts. These in turn can shape community attitudes and levels of concern about sustainability more generally.

The ACT population is relatively affluent and well educated (see the *Driving Forces* paper). We are also home to many tertiary educational facilities and research organisations, and therefore are very well placed to be well informed and have scope for making more sustainable buying choices. Accessing and coordinating the wealth of information generated in these disparate organisations and sectors, and applying this knowledge in positive ways to progress sustainability remain a challenge.



The impact of these changes, whether negative or positive, will be central to our ongoing environmental, social and economic sustainability. Public interest, understanding, and concern about environmental issues more generally is another consideration. The importance given to any social issue can vary over time triggered by local, national and global events, and by media coverage. There is a danger that the mainstream use of the term 'sustainability', and in more extreme circumstances 'greenwashing', are having profound and often negative effects on public's understanding of environmental messages (Cork 2011).

Thus, while media attention can be highly influential in highlighting environmental issues, new information technologies are bringing global events and trends to bear more immediate and pervasive thinking at local levels. For example, community-driven international movements such as *Transition Towns*, are spreading to many different countries. Other initiatives such as *Less than 2 Degrees* are solely internet-based networks sharing information and ideas for action. The continuing re-assessment of national boundaries beyond militaristic and governance control to areas such as economic, cultural and even emotional well-being, is likely to continue to shape the global and Australian agenda (Cork 2011).



Source: ACT Government

Relationships between the ACT and the region

Considering changed forms of governance was central to horizon scanning discussions. Participants broadly agreed that having appropriate governance systems that allow for a degree of experimentation and self-organisation when dealing with problems, would strengthen communities in the region (Cork 2011). How this can be developed in the region is a challenge for all levels of government and the community.

As a comparatively large population relative to our total land area, the ACT is more interconnected with its region than any other state or territory, presenting governance challenges for both sides of the border. Many of the emerging issues already identified, could change the shape of the region and the relationships between the region and the ACT. Decisions about accommodation of our growing population, technology, natural resources and landuse will together shape the future of the region.

The exacerbation of environmental stress is intensifying, with issues surrounding catchment and bushfire management, provision of infrastructure for a growing and changing population, and the management of energy resources. The cross-border nature of these challenges emphasises the increasing importance of effective intergovernmental arrangements.



Canberrans' vision for the future of our city

The sheer number and complexity of the challenges that we face can seem overwhelming. However, the *Time to Talk Canberra 2030* conversation was just one illustration of the willingness and capacity of Canberrans to engage with the Government and other sectors of the community in working to create a better future for the ACT. The picture that emerged of what Canberrans hoped for as a vision for a future included:

- enhancing Canberra's greenspaces;
- reducing carbon emissions, consumption and generally being more environmentally responsible;
- increasing housing diversity to meet the needs of all people and create vibrant neighbourhood centres and communities;
- employing a strategic approach to planning that brings together affordable and sustainable transport and housing;
- recognising and balancing the needs of younger and older Canberrans; and
- building employment opportunities through green knowledge and service industries.

Progressing sustainability in the ACT

The future is a product of our actions in the present, not a set destination that we are heading towards. Creating a sustainable community will involve addressing many diverse and interconnected issues, and require concerted and continuing action in the face of considerable uncertainty. This kind of complexity is a common characteristic of 'wicked problems' (Rittel and Webber 1973). Consequently, actions to address sustainability challenges are most likely to succeed when developed and implemented collaboratively with multiple stakeholders devising and implementing actions. Achieving positive change will also require developing different forms of living and governance (Brown et al. 2010:4). Community members, as well as government, subject specialists and business people, are key holders of expert knowledge and experience. Further, the relatively affluent, well educated and involved community, strong education and research institutions and multiple levels of government within the ACT position us well to take on sustainability challenges.

This SoE Report indicates that the two biggest challenges for sustainability in the ACT are:

- reducing our consumption; and
- balancing urban development with protection of ecosystem values and services.

Taking strong action to address these two central issues is critical for achieving improved sustainability. However, we also need to find a balance which acknowledges the realities of an increasing population, our relative affluence, enviable quality of life and urban amenity, and our location within a market-based economy.

Reducing our consumption

Our continually increasing ecological footprint tells us that in Canberra, we are consuming at an unsustainable rate. While 'per capita' improvements to our energy and water-use sustainability are a step in the right direction, the finite nature of global resources means that reductions in our ecological footprint, greenhouse gas emissions, energy and water consumption and waste generation must occur in the ACT at an aggregate level.

While this may seem daunting, there are many positive examples that we can build on. For example, retrofitting buildings is seeing significant reductions in energy use and waste generation (see story on improving office sustainability). Further, *OzHarvest Canberra* has been finding innovative ways to reduce waste by distributing excess food to charities and the University of Canberra has phased out the sale of bottled water on campus reducing waste, energy and pollution.



Opportunities are widespread and actions can actually enhance our quality of life and result in cost savings. For example, promoting benefits such as the increased fitness associated with active transport can result in cost savings for health services provided for managing obesity. Further, new business ventures and jobs can be generated from investment in renewable energy industries and buying more sustainable products can result in localised social and economic benefits too. These are just some of the 'win-wins' that can take place as a result of actions taken to improve the sustainability of the ACT (Ryan 2011).

In other areas, government policy could also focus on consumption 'hotspots' within the control of the local community. For example, the drive down to the local shops can have a greater carbon footprint than the entire content of the shopping basket (Ryan 2011), while consumption of highly processed 'junk' food has been calculated to contribute one third of the food sector's climate emissions (Pearson 2011).

Research indicates that 80% of Australian supermarket consumers think about environmental issues when shopping (McKenzie-Mohr et al 1999 in Pearson 2011). Therefore, providing better information to consumers about the impacts of their buying choices is a vital part of progressing the ACT's sustainability. However we also know that there is a gap between our attitudes and values (what people think and feel), and our actions (Eckhardt et al. 2010). Drawing on social research that offers insights into how to address this gap will be vital if we are to convert current levels of environmental awareness into positive actions. Finally, working with business and harnessing technological innovation, particularly using new information technologies and educational tools, will be central to maintaining community engagement and changing consumer attitudes and patterns of behaviour.

The Australian Capital Region has seen an increase in renewable energy generation and use, with a focus on solar technologies in the ACT and wind generation in the wider region. We are also seeing opportunities for water management, such as the Upper Murrumbidgee Demonstration Reach Project, that bring people together and act as a catalyst for new and more effective ways to approach environmental challenges.

Possibly the most cost-effective way to reduce stationary energy emissions is through energy-efficiency measures in both commercial and domestic sites. Reducing energy waste and purchasing energy efficient appliances can also generate significant cost-savings (Heuris 2010). While it is individuals that ultimately make the purchasing decisions, many opportunities for savings lie within the regulative control of the ACT Government, for example current draft amendments to the Territory Plan aim to improve the solar efficiency of houses by defining and limiting a building's envelope and by improving the design and orientation of new lots. Balancing urban development with protection of ecosystem values and services

A sustainable city is arguably one which balances environmental, social and economic needs. Residents should have access to appropriate, affordable housing, in proximity to work and recreational opportunities along with community facilities such as schools, shops, medical and other services. Finally, a sustainable city offers an integrated transport network that allows people to move between energy efficient residential and commercial buildings.

Much of our city's liveability, as well as our citizen's high environmental awareness, can be attributed to our proximity and easy access to national parks, nature reserves, and urban open space. Both expansion of the city and densification in response to population growth are major components in the growth of our ecological footprint, which consequently threatens the health and viability of ecosystems. Impacts include loss of native vegetation and particular ecological communities, such as grasslands, as well as increased run-off, disruption of water flows, pollution and reduced ecological connectivity. The resulting changes do not only have effects on the natural environment and its flora and fauna, but also on the capacity of the environment to meet our needs, especially for water.

We have a strong nature park and open space system, where residents and visitors alike, can enjoy the natural environment and the aesthetic, recreational and health benefits it offers. This rich resource is also a base for extending environmental awareness, education and engagement. Collaborative and innovative projects between community groups and government are already underway. For example, one program to revegetate and restore the Cotter River Catchment has improved water quality in the Cotter Reservoir. Research and restoration in the Mulligans Flat-Goorooyarroo Woodland is linking monitoring and data collection to conservation management. Another project, Platypus Count, is involving the community in environmental monitoring, advocacy and stewardship activities.



Source: ACT Government



In urban areas as well, greater concern and awareness of the impact of development is creating a desire and action among segments of the population, for more sustainable forms of construction in new developments. There are encouraging signs that retrofitting existing housing stock is gaining momentum. For example, retrofitting of houses was showcased at the annual *Canberra Sustainable House* day. While still only small in impact, these efforts are providing models for moving towards greater sustainability in residential and commercial developments.

If we are to effectively manage our expanding built area, the value of our green infrastructure must be calculated, and then strategically assessed against the affordability and demand for housing. This assessment should move beyond incorporating costs of building to including long-term savings in terms of energy, water and transport efficiency, in order to have genuine social benefits. Additional consideration should be given to the existing urban form, where spatial distribution and ageing infrastructure present key challenges for allowing energy efficient movement, housing and access to employment.

Balancing our ability to respond to unknowns, with initiatives to enhance our resilience in specific areas will be a key challenge into the future. Although community-based actions are undoubtedly integral to improving our sustainability as a whole, there is also an important role for regulation, or top-down leadership and decision-making. A framework for sustainable action may be achieved with a combination of strategic infrastructure development, financial incentives, community education and regulation. However, to be effective, this needs to be based on sound long-term assessment and modelling of environmental indicators.

We have knowledge and other resources and we can, with goodwill and commitment, move as a community towards a more sustainable future. Residents of the ACT are relatively affluent and well educated and live in a city with generous amounts of greenspace surrounded by nature parks. Further, we have many strong education and research institutions and are the seat of both Commonwealth and Territory Governments. As such, we have a real opportunity to demonstrate leadership in becoming a centre of excellence as a sustainable city by using our resources and creativity.



Source: ACT Government



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Other data sources

In addition to these published reports, data for this paper were also sourced from:

NSW Department of Planning and Infrastructure.

