



Delfin

Lend Lease

SUBMISSION TO THE
ENVIRONMENT AND HERITAGE COMMITTEE, HOUSE OF
REPRESENTATIVES, PARLIAMENT HOUSE

INQUIRY INTO SUSTAINABLE CITIES 2025:
A Blueprint for the Future

PREPARED BY: DELFIN LEND LEASE

OCTOBER 2003

Contents

1. Purpose of Submission

2. About Delfin Lend Lease

3. Sustainable Cities 2025

4. Aspects of Sustainability

Appendix A Project Descriptions

Appendix B Key Contacts for Further Information

1. Purpose of Submission

The purpose of this submission is to respond to the Committee's terms of reference by identifying:

1. the views of Delfin Lend Lease (DLL) as Australia's pre-eminent developer of urban communities, concerning the matters raised in the terms of reference; and
2. relevant information drawn from current DLL urban development projects to illustrate specific aspects of sustainability.

This submission does not set out to encompass all of the aspects associated with sustainable urban development. Many of the issues are complex and interrelated. In particular, it does not attempt to respond directly to the 'questions for consideration' included in the Discussion Paper, 'Sustainable Cities 2025', although it addresses many of the issues raised. The submission has been prepared to respond specifically to the terms of reference. DLL would be pleased to provide any relevant supplementary material to the Committee's inquiry as required, and to provide site tours of DLL projects for the Committee.

A list of contacts for further information is provided in the Appendix together with a brief description of each DLL project.

2. About Delfin Lend Lease

Delfin Lend Lease is a part of Lend Lease Corporation, an integrated property group that operates throughout the world and offers services in project management, construction, development, capital restructuring, asset management and funds management.

Delfin Lend Lease is the largest and most recognised developer of urban communities in Australia, operating in nine major population centres across the country. It has a current backlog of approximately 35,000 lots, primarily in the major growth corridors along the eastern seaboard of Australia.

Delfin Lend Lease is focussed on large-scale urban community development. The duration of projects range between three and twenty years.

Lend Lease also operates an inner urban development business, underpinned by three large projects, Jacksons Landing and Newington in Sydney and Victoria Harbour in Melbourne.

Delfin Lend Lease is currently developing over 20 projects around Australia, ranging from large-scale master planned communities to medium density housing schemes.

The planning, development and marketing activities at our projects are guided by a set of principles referred to as 'The Delfin Advantages'. These advantages drive the creation of special places and also address the various aspects of sustainability.

- ***A sense of belonging***
Delfin Lend Lease is committed to creating friendly, safe places where people can get the most out of life; places that surprise and delight; places that present every resident with the opportunity to succeed and to fulfil their own aspirations; addresses that people can be proud of.
- ***Greener open spaces***
Delfin Lend Lease is committed to delivering a quality living environment with leafy streetscapes, beautifully landscaped parks and gardens together with plenty of useable green and natural spaces for walking, cycling and outdoor activities.
- ***Fully planned community***
Delfin Lend Lease is committed to the timely provision of key community, recreational and learning facilities involving comprehensive planning and the innovative delivery of a range of lifestyle activities.
- ***Quality housing options***
Delfin Lend Lease is committed to the delivery of a wide range of housing choices to meet the diverse aspirations and needs of people and families of all ages and backgrounds. What's more, quality-housing standards are maintained through fully managed covenants providing residents with confidence and integrity of lifestyle.
- ***Learning communities***

Delfin Lend Lease is committed to the delivery of education services in innovative ways. Education that provides the platform for the continued learning and development of people of all ages.

- ***Business prosperity***

Delfin Lend Lease is committed to the development of employment and investment opportunities by encouraging vibrant business addresses where business can grow and prosper.

- ***Attention to detail***

Delfin Lend Lease is committed to maintaining the highest quality standards of presentation and detail. Standards that set the benchmark for best practice throughout Australia and the world.

- ***Respect for our environment***

Delfin Lend Lease is committed to building and showcasing special places that respect and enhance the natural environment. Places that demonstrate our leadership in building sustainable communities for the enjoyment of future generations.

In DLL's view, sustainable urban communities will be healthy communities that endure over time and will be desirable and attractive places to live and work in. To that end, sustainability is a significant consideration at various stages of the planning and development process for DLL projects, including:

- Project selection
- Project assessment
- Master planning and urban design
- Construction marketing and sales
- Asset maintenance and handover
- Ongoing administration

3. Sustainable Cities 2025

Introduction

Sustainability is a key aspect of the way DLL undertakes urban community creation. The Delfin Advantage of 'Respect for our Environment' drives the company's commitment to build special places that respect and enhance the natural environment. Our projects are intended to demonstrate our leadership in building sustainable communities for the enjoyment of future generations.

'Sustainability' within DLL involves initiatives that encompass the three components of 'ecologically sustainable development', namely social, economic and biophysical aspects.

From DLL's perspective as a major residential developer, five issues appear to be most important in relation to promoting more sustainable urban development.

1. **Scale:** regional strategies and land release programs should encourage and facilitate large scale urban development projects which involve comprehensive planning and coordinated development and allow sustainability objectives to be addressed.
2. **Institutional Arrangements:** the commercial and sustainability objectives of agencies responsible for land release programs or planning and delivery of urban services (water, sewerage, stormwater, electricity) need to be aligned to promote sustainability. This should include a review of relevant pricing policies, e.g. potable water vis-à-vis grey water.
3. **Funding:** key items of urban infrastructure (water, sewerage, stormwater, roads), lifestyle amenities (such as open space) and services (such as schools and emergency services), need to be better funded in the fringe areas of Australia's metropolitan regions to allow the development of fully serviced communities. Funding mechanisms need to be sustainable: user benefit infrastructure can appropriately be funded through development contributions, but social benefit infrastructure should be funded through progressive forms of taxation, in order to ensure intergenerational equity.
4. **Broad Support:** there needs to be broad acceptance, including market / consumer acceptance, of proposed measures to promote more sustainable urban development. This requires 'ownership' of the desired outcomes by the three spheres of government, developers and financiers, and the community. Outcomes need to be commercially feasible as well as ecologically sustainable.
5. **Policy Frameworks:** Policy frameworks of all three spheres of government should be aligned to promote sustainable outcomes. Innovations to promote sustainability can be frustrated at present by conflicting or obstructive policies of government agencies.

The following sections respond directly to the Committee's Terms of Reference:

Terms of Reference

The House of Representatives Standing Committee on Environment and Heritage will inquire into and report on issues and policies related to the development of sustainable cities to the year 2025, particularly:

1. The environmental and social impacts of sprawling urban development;
2. The major determinants of urban settlement patterns and desirable patterns of development for the growth of Australian cities;
3. A 'blueprint' for ecologically sustainable patterns of settlement, with particular reference to eco-efficiency and equity in the provision of services and infrastructure;
4. Measures to reduce the environmental, social and economic costs of continuing urban expansion; and
5. Mechanisms for the Commonwealth to bring about urban development reform and promote ecologically sustainable patterns of settlement.

1. The Environmental and Social Impacts of Sprawling Urban Development

Current patterns of urban development carry significant social and economic costs; however, use of the term 'sprawl' is not necessarily helpful in understanding the nature of the problem or possible ways of improving urban outcomes. Some eminent commentators (e.g. Professor Brendan Gleeson at Griffith University) have argued that 'sprawl' is not an Australian phenomenon in the sense that the term is used in the US to describe largely uncontrolled urban development. Accordingly, there is a need to distinguish between 'sprawl', and processes and patterns of urban expansion in Australian cities.

Most new urban development in Australia occurs on a piecemeal basis with the result that employment, services and transport lag behind actual needs. Much of the workforce in outer suburbs has to travel outside the locality in order to access employment. The key issue is therefore the structure, not the form (density) or location of urban development. Provided that new urban areas are properly serviced with employment, public transport / arterial roads, and basic community facilities (such as schools, community centres, and emergency services), the urban development can provide for outcomes that are sustainable. Moreover, even the most ambitious programs of urban consolidation will not obviate the need for greenfield development, hence the policy objective of the Commonwealth and State Governments should be to encourage and facilitate the types of greenfield development that are more sustainable, such as large-scale master planned communities.

Because of fiscal pressures, most State Governments are placing increasing reliance on development contributions to fund urban infrastructure. This can create outcomes that are inefficient and inequitable, and thereby undermine the social sustainability of new development as well as the commercial viability of urban development projects.

Institutional arrangements can also undermine sustainability objectives, because the vested interests of utility organisations may run counter to more sustainable techniques for delivery of services such as water supply or sewage treatment, or because of diffuse responsibilities (i.e. roads and utilities and human services being delivered by different agencies, preventing a 'whole of government' solution to urban development challenges).

The affordability implications of government-imposed land supply constraints need to be recognised. The urban development and housing industry has been relatively efficient in providing affordable residential land and housing in Australia. These affordability advantages need to be preserved in any program to improve the sustainability of Australian urban development and housing.

Recent research by Professor Patrick Troy of the Centre for Resource and Environmental Studies at the ANU in Canberra suggests that much more can be done at the level of individual households to improve their sustainability, including energy use, water use and waste generation.

2. The Major Determinants of Urban Settlement Patterns and Desirable Patterns of Development for the Growth of Australian Cities

As the Special Premiers' Conference working group on Patterns of Urban Settlement noted in its report in 1991, Australian cities tend to be characterised by low density development facilitated by the use of private transport and this development pattern has been the result of structural and attitudinal factors including: availability of land, housing preferences, strong demand for housing (arising from population growth, immigration and household formation), pricing policies and State and Local Government planning and zoning processes.

Consumer demand has strongly favoured family oriented suburbs made up of individual detached houses with private gardens (and providing for basic community and lifestyle benefits such as parks and schools). Consumer demand for housing is now increasingly diverse, as a result of demographic, social and cultural change.

A more 'desirable pattern' of development for Australian cities would include:

- more greenspace protection, providing for local and regional greenspace connectivity;
- more workers living in close proximity to city centres, and more jobs in outer suburban areas where the majority of workers live;
- enhanced opportunities to travel by public transport, walking and cycling;
- development of communities in outer suburbs that are more self-contained (i.e. the creation of real 'neighbourhoods', with schools, shops, community facilities and jobs provided locally).

Outcomes need to be 'commercial', in the sense that they reflect consumer needs, aspirations and preferences, and also provide for a reasonable return on investment for private developers and government infrastructure providers.

Master planned communities, by virtue of their size and approach, offer scope for comprehensive planning and coordinated development. This accordingly offers the prospect of breaking the cycle of piecemeal development and infrastructure deficiencies, which at present severely penalise households living in the outer suburbs of metropolitan areas. Master planned communities are able to address the issues that are widely regarded as important to the future development of Australian cities, including protection of the natural environment, creation of job opportunities and improving access to facilities and services. At present, the differing returns on developing land for residential as compared with community and industrial purposes discourages developers from creating mixed use, integrated communities.

Because of the inherent benefits of master planned communities, satellite town development may be a more sustainable pattern of urban expansion in some metropolitan regions. This would involve greater decentralisation of employment opportunities, and removal of some inappropriate non-urban designations in suitable locations. It could also involve more localised systems of sewage treatment to achieve more sustainable water cycle management.

Land release strategies should promote large-scale master planned communities or facilitate coordination of small-scale subdivisions. There are clear advantages in applying a land release model that encourages the market to assemble parcels that can be properly master planned and then developed in a coordinated way.

3. A Blueprint for Ecologically Sustainable Patterns of Settlement

Key elements of a 'blueprint' for ecologically sustainable patterns of settlement could include:

- Improved home / work relationships.
- Improved mobility (public transport, walking, cycling).
- Focus on building real communities, properly serviced with schools, shops and community facilities.
- Development of integrated, mixed used communities (with on-site jobs).
- Natural habitat protection.
- Protection of environmental quality (air, water, noise).
- Reuse of resources such as recycled water for park irrigation or industrial or agricultural use.

Again, this suggests that governments at all levels should promote larger projects (which are able to achieve more sustainable patterns of settlement because of their economies of scale, ability to create a strong sense of place, and potential to address the fundamental environmental issues). It may also require new institutional and funding arrangements for infrastructure (to achieve more localised and ecologically sustainable solutions for water cycle management). Master planned communities offer advantages to government and private service providers, as the rapid rate of development means that projects quickly achieve critical mass for efficient delivery of the relevant service (such as schools or public transport). Master planned communities should therefore be considered part of the 'blueprint' for more sustainable patterns of urban settlement in Australia by creating a more orderly and coordinated growth pattern, and could be appropriately located within designated urban growth corridors or as satellites (if relatively self-contained). Corridor and satellite development allows protection of greenspace connections and systems.

4. Measures to Reduce Environmental Costs of Continuing Urban Expansion

A wide range of measures can be employed to reduce the environmental, social and economic costs of continuing urban expansion. Later sections of this submission explain some of the techniques being applied in DLL projects to improve sustainability. These include a combination of technical solutions to particular environmental challenges such as protecting water quality, as well as consumer and builder information and incentive programs, and partnerships with government and non-government organisations to promote best practice or identify new techniques for sustainable urban development.

It is clear that with the continuing strong population growth being experienced in Australian cities as a result of natural increase, international migration and in some locations, interstate migration, more land will need to be designated for urban development in metropolitan regions. It will not be feasible to accommodate the forecast growth of population in established urban areas through processes of redevelopment, infill or conversion, although dwellings produced through those processes meet a need for relatively high cost housing in particular locations (e.g. close to city centres). The policy option of 'urban growth boundaries' therefore needs to be considered in the context of a number of issues, including:

- The need for long-term protection of greenspace (which requires public ownership and management).
- The appropriateness of preserving agricultural land in metropolitan regions.
- Supply side affordability issues (availability, time for conversion, cost of approvals, infrastructure contributions).
- Consumer demand for detached houses in suburbs (albeit at higher densities than were typical previously).
- The cost of dwellings produced through urban consolidation processes (and the relative roles of urban renewal v greenfield development in meeting dwelling demand in Australian cities over the next twenty years).
- Public resistance to urban consolidation programs in relatively stable middle suburbs of Australian cities.

Any attempt to prevent the expansion of metropolitan areas will have severe supply and affordability impacts for new housing. Given that it is inevitable that new suburbs will be required to meet dwelling demand, the key need is for the structure of new residential suburbs to meet sustainability objectives, e.g. with respect to provision of local employment opportunities, public transport and local schools and shopping. If new urban development is undertaken with sufficient sensitivity then it will be positive from an environmental, social and economic perspective. Decisions on whether particular land should be made available for urban development must still take into account issues such as consumer needs and aspirations, infrastructure costs, and the inherent values of the land (biophysical, cultural heritage, etc.). Institutional arrangements need to be reviewed to ensure that infrastructure provision and funding assist in achieving sustainability objectives.

5. Commonwealth Urban Reform / ESD Promotion

Consistent with the views expressed by, among others, the Property Council of Australia, it is apparent that the key urban development issues require a sustained national response. The principal role of the Commonwealth Government should be to encourage and facilitate:

- Reform of infrastructure charging and institutional arrangements (to promote efficiency, equity, environment objectives).
- Reduction in State and Local Government charges and taxes on new land and housing.
- Provision of adequate supply of affordable housing – there is a need for more funding for public rental housing (including inclusion in new housing areas).
- Adequate infrastructure funding and improved coordination of transport facilities, particularly of urban freeways and passenger rail lines, including support for innovative financing techniques.

- Reform of State and local planning systems to remove supply side constraints on provision of housing, and to achieve greater national consistency in standards of development.
- Development of Commonwealth Government land holdings to promote more sustainable outcomes.
- Research into new techniques for improving sustainability at the level of individual households through CSIRO and other bodies.
- Education about best practice.

Another opportunity is to reform the tax system to promote ESD through R & D style tax incentives.

4. Aspects of Sustainability

Sustainable Cities 2025 suggests that the sustainable Australian city of the future should achieve the following visionary objectives:

1. Preserve bushland, significant heritage and urban green zones;
2. Promote efficient use of energy including renewable energy sources;
3. Establish an integrated sustainable water and stormwater management system addressing capture, consumption, treatment and re-use opportunities;
4. Manage and minimise domestic and industrial waste;
5. Develop sustainable transport networks;
6. Incorporate eco-efficiency principles into new housing; and
7. Provide urban plans that accommodate lifestyle and business opportunities.

The following section of DLL's submission reviews how these aspects are being incorporated in DLL urban community projects around the country.

1. THE SUSTAINABLE AUSTRALIAN CITY OF THE FUTURE SHOULD:

PRESERVE BUSHLAND, SIGNIFICANT HERITAGE AND URBAN GREEN ZONES

Precautionary Principle

The precautionary principle, which requires an understanding of the current and future impacts of development, is a fundamental principle of master planning on all DLL projects. Springfield Lakes, Varsity Lakes and St Marys have each initiated major studies to better understand and integrate within their respective natural systems.

Retention and Integration of Environmentally Significant Areas

As a result of these studies and detailed master planning, DLL has sought to retain environmentally significant areas in a sustainable manner on several projects as outlined below.

- Forest Lake has retained the Blunder Creek corridor and treated its edge to ensure minimal 'edge effects'.
- The Sanctuary has retained wetlands and woodlands to buffer to the Georges River.
- Riverside Gardens has retained and integrated into the riparian vegetation along its 4.4 kilometre frontage to Ross River.
- Varsity Lakes has retained the Reedy Creek corridor.
- Twin Waters has dedicated a 120Ha Environmental Reserve containing rare flora and fauna species, which is now managed by Queensland Parks and Wildlife.
- Springfield Lakes has retained a 5Ha Environmental Reserve and will rehabilitate sections of the Opossum Creek Corridor.
- The Chase has retained, enhanced and integrated the Palmerston Town escarpment into its residential areas in a sustainable way.

Integration of Significant Fauna Corridors

The precautionary principle requires that sufficient knowledge be obtained about development sites to ensure that future development respects the values of the local ecosystem. Examples of integration of fauna corridors include:

- Holroyd Gardens has incorporated habitat and corridor for an endangered frog, in a sustainable way in the centre of an urban community.
- Forest Lake has retained the Blunder Creek corridor as well as adjacent corridors that link to Oxley Creek, which contain significant frog habitats.
- Springfield Lakes has planned to allow the retention of the major fauna corridor of Opossum Creek through the development, and integrated this with the proposed stormwater management system that includes a lake.
- In addition to the retention of fauna corridors, North Shore Coastal Village has undertaken measures to reduce the impact of the residential development upon an adjacent Conservation Park. Cat proof fences have been installed to protect endangered species within the Park and the landscape treatment has been carefully selected to support bird movement.
- Other strategies to protect local fauna have been implemented at Twin Waters, in order to limit the attraction of birdlife to its lake. This was important to minimise the risk of birdstrike to aeroplanes operating out of a nearby airport.

Integration of Urban Green Zones

In addition to the retention of environmentally significant areas and fauna corridors, detailed open space master planning is undertaken on all DLL projects to ensure that the open space needs of the future community are successfully accommodated. Significant pockets of high quality vegetation, wetland areas and natural creek corridors are retained within open space areas. Open space planning balances these environmental values together with stormwater and recreation needs.

As a result of this planning:

- Forest Lake has retained 13% (130Ha) of the site as open space.
- Springfield Lakes will retain approximately 25% (101Ha) of open space.
- Mawson Lakes will retain 30% (189Ha) of open space including lakes and waterways.
- St Marys will retain over two-thirds of the development site as open space including an 847Ha Regional Park.

Vegetation Retention

Where vegetation exists upon the site that can be retained in a sustainable way within the urban fabric, careful planning can retain a portion of the vegetation within the community.

- At Twin Waters the existing vegetation has been retained with due care to water tables and other relevant issues for this coastal development.
- Forest Lake has an active program of retaining trees within the development both within private lots and in the public realm. This retention varies from retention of young trees that can mature into the future regime to the retention of mature trees where root zones and water regimes can be protected.
- Springfield Lakes has an active vegetation retention program that keeps trees in both public and private areas.

Rehabilitation of Degraded Sites

DLL has undertaken significant rehabilitation measures on existing degraded sites, including:

- North Shore Coastal Village, which has rehabilitated a neglected former development site containing acid sulfate soils and has reintroduced extensive native landscaping endemic to the area;
- Mawson Lakes, which is addressing salinity issues; and
- Springfield Lakes, which has rehabilitated a former refuse tip site.

Retention and Integration of Cultural Heritage

The integration of significant cultural heritage elements within a community helps to provide a focus for the community that builds upon the past histories of a site where they are relevant to the future community.

- Holroyd Gardens is a community based around the retention of elements of the old brickworks as the civic core for the future residents.
- Edgewater is retaining many of the elements of the past uses of the site and incorporating them into the community as key facilities for the future residents.
- Twin Waters has retained the historically significant Mango Park, which is the site of the first 'European' settlement in the area.
- Springfield Lakes has retained significant cultural artefacts within parkland areas.
- Forest Lake retained the remnant vegetation on the site of the original homestead within a village park.

2. THE SUSTAINABLE AUSTRALIAN CITY OF THE FUTURE SHOULD: PROMOTE EFFICIENT USE OF ENERGY INCLUDING RENEWABLE ENERGY SOURCES

All DLL developments are designed using solar orientation as one of the urban design constraints. Solar access to residential lots is optimised through consideration of the aspect, shape, topography and slope of the particular sites.

Projects that have implemented additional energy efficiency initiatives include:

- Nelsons Ridge, which will eventually deliver almost all of its housing with a favourable climatic and topographic aspect.
- Mawson Lakes, which will be the first development in South Australia to introduce an Energy Rating Score sheet. This strategy aims to reduce domestic energy use by 50 per cent compared to the Adelaide average. The checklist identifies preferred ways to reduce energy consumption with each home required to meet a set standard before construction commences. Additionally, innovative and cleverly designed solar powered lighting is currently being introduced into selected public areas.
- St Marys, where lots are required to achieve a NatHERS rated solar access of at least 3.5 stars. This will be achieved through the allotment size and orientation having regard to slope and other factors in order to maximise opportunities for solar access.
- Newington, which includes photovoltaic panels on many houses and together with Mawson Lakes has mandated solar hot water.
- Forest Lake is introducing a purchaser award scheme to encourage residents to incorporate energy saving measures in their house designs.

3. THE SUSTAINABLE AUSTRALIAN CITY OF THE FUTURE SHOULD: ESTABLISH AN INTEGRATED SUSTAINABLE WATER AND STORMWATER MANAGEMENT SYSTEM ADDRESSING CAPTURE, CONSUMPTION, TREATMENT AND RE-USE OPPORTUNITIES

Capture of Water

Some of the key initiatives at DLL to promote the capture of rainwater for domestic use include:

- Springfield Lakes, which will demonstrate four HIA GreenSmart display homes in 2004 each with rainwater tanks. Rainwater captured will be used in toilet flushing, laundries and garden watering;
- At Twin Waters, rainwater tanks are required on all medium density sites;
- St Marys will require rainwater tanks on all lots exceeding 400m²;
- Forest Lake is providing incentives to residents to install rainwater tanks; and
- Pakenham is investigating the promotion of rainwater tanks to residents.

Water Consumption

DLL developments generally utilise local native plants for planting within parks and streetscapes to reduce water requirements. Drought resistant grasses have also been planted in open space and residential lawns on certain projects. During drought conditions, Caroline Springs and Pakenham have wetlands that can be used for irrigating public open space areas. These practices are particularly important in ensuring the long-term sustainability of public open space under local government management. The two projects which best highlight the use of an endemic planting scheme are North Shore Coastal Village and Newington.

The HIA Greensmart Display homes at Springfield Lakes will demonstrate measures to reduce the domestic consumption of water. St Marys will have a series of mandatory domestic requirements for all homes such as low flow shower roses, aerators on taps and dual flush toilets. Forest Lake is introducing a purchaser award scheme to encourage residents to incorporate water saving measures in their house designs.

Stormwater Treatment

Stormwater Systems- Improving Natural Outcomes

Careful urban design and understanding of the environment allows stormwater systems to be developed that greatly improve the quality of the waters entering and leaving many of DLL communities. These efforts minimise the impact on the environmental values of downstream waterways.

- Forest Lake and Springfield Lakes both retain the existing creeklines to allow the natural system to treat the stormwater and achieve enhanced water quality outcomes.
- Varsity Lakes has incorporated significant wetlands and devices along Reedy Creek to treat the water entering the site before it discharges into the lake systems.
- Forest Gardens retains the natural creek lines, undertakes measures to control sediment and has exposed the natural aquifer recharge points to better retain the natural hierarchy of the water flow.

Water Sensitive Urban Design

Water Sensitive Urban Design (WSUD) is a more natural way of replicating the power of the natural system as a water cleansing and regulation agent. It considers treatment for the 'whole of catchment' not just individual development sites.

- The Cascades at Forest Lake contains swales along roadsides that condition and control the stormwater. Downstream wetlands ensure that the water quality further improves as well as recharging the groundwater, allowing a healthier landscape to flourish and regulating flows to better match the natural regime of the creek. The Cascades served as a leading test case for WSUD for Brisbane City Council.
- North Shore Coastal Village utilises infiltration pits to discharge roofwater runoff into for rapid soakage into the groundwater table. Twin Waters similarly uses biofiltration units to treat runoff from medium density development.

Sustainable Lakes

Water is an important place-making element within DLL communities. The design and embellishment of natural systems to create lakes for a community focus takes into consideration the potential long-term maintenance and water quality issues.

- Forest Lake includes an 11Ha lake as one of the central community foci that has been designed to naturally produce an improved water quality within its system. This lake has been built for nine years and is matching its water quality objectives and maintenance outcomes. The lake was initially seeded with suitable species to create a living ecology and has since become a significant wildlife habitat.
- Springfield Lakes has a planned series of lakes (totalling 23Ha) that will be designed to allow the development to cleanse its outflows prior to stormwater leaving the site. The incorporation of significant wetlands and other measures within the lakes and prior to discharge to the lakes (such as sand filters and infiltration trenches) is intended to enhance the sustainability of the lakes. The first lake has been constructed and filled, and additional water quality management works are programmed in order to achieve the planned performance.
- The Serpentine at Caroline Springs is allowing the runoff from the Caroline Springs community to improve the quality of the waters departing the site while utilising the wetlands and lakes as a major place making element and wildlife habitat.
- The design of the lake outlet at Twin Waters took into consideration measures to limit impacts of development upon the Maroochy River tidal prism and sensitive downstream fish habitat areas.

Other stormwater management principles which Forest Lake has initiated over time, include:

- a unique sediment basin and trash rack design;
- advanced design wetland filters to maximise nutrient uptake;
- gully to gully drainage that is self cleaning; and
- unique kerb and channel profiles.

Public Education Programs

Public education programs have been undertaken to inform the public about their responsibilities with respect to their local environment. These programs also activate the community into caring for their environment. Examples of such programs include:

- Forest Lake has undertaken a significant public education program with respect to the responsibilities of people living in the catchment of its central lake.
- Key elements of this program are currently being implemented at Springfield Lakes.

Water Reuse

By using either recycled stormwater or treated effluent there can be a significant reduction in the use of potable water.

- Newington has installed infrastructure to enable recycling of treated effluent back to parklands for irrigation and houses for use in watering gardens, flushing toilets and washing cars.
- Springfield Lakes is currently trialing the use of treated effluent in a number of different public and private applications to allow wider community use at a later date.
- Mawson Lakes has incorporated a system that recycles both stormwater and treated effluent and recharges an aquifer that then supplies recycled water for use in domestic gardens and toilets as well as to irrigate the public domain. It is estimated that the recycled water system will provide 7 per cent of Mawson Lakes' overall water requirement.
- North Shore Coastal Village plans to utilise recycled water on lawn areas for irrigation.

4. THE SUSTAINABLE AUSTRALIAN CITY OF THE FUTURE SHOULD: MANAGE AND MINIMISE DOMESTIC AND INDUSTRIAL WASTE

Minimising Waste Through Responsive Design

Through careful master planning, the development patterns of DLL communities are designed to be responsive to topographical features. This principle reduces the generation of construction waste. Roads for instance are sited with respect to existing contours to limit the excavation or filling of material.

On sites with steeper terrain, DLL is promoting the use of housing construction techniques which are responsive to the landform. Springfield Lakes is promoting the use of split slab, suspended flooring and lightweight factory built housing. By promoting 'non slab' housing techniques, the amount of earthworks on individual sites and hence construction waste will be considerably reduced. These principles are promoted through a building covenant for residential homes, design advice and builder education.

Situated on landform with similar topographic constraints, Nelsons Ridge will also be promoting alternative housing techniques that are responsive to slope.

Minimising Waste during Construction

Given that construction and demolition waste comprises 2 per cent of landfill in Australia, DLL has developed waste management systems and construction procedures to reduce waste and assist in improving the sustainability of urban development.

Waste Management Systems

- Mawson Lakes has waste management guidelines that will help reduce and recycle waste from building construction and daily living and working. The target is a 50 per cent reduction in construction and domestic waste dumped as landfill.
- The HIA GreenSmart Display Homes at Springfield Lakes will demonstrate a responsible waste management system. Approximately 80 per cent of the building waste from the GreenSmart homes will be recycled at a waste recycling station in Brisbane. In addition, recycled materials will be used where practical throughout the display homes.
- St Marys will have a dedicated area for the on-site sorting, stockpiling and temporary storage of construction waste. This area will be accessible to waste collection vehicles for transfer to off-site waste recycling plants.
- Caroline Springs has a builders waste/ recycling trial underway. There is a significant amount of rock at Caroline Springs and as a consequence DLL has established a rock crushing plant that delivers to the project most of the site's crushed rock needs. This

results in good use of a local resource and fewer large, slow, dangerous trucks on the road network.

Other Measures to reduce Construction Waste

- At North Shore Coastal Village seven existing buildings were demolished and all the materials were either reused or recycled on site.
- Twin Waters successfully implemented an innovative technique for treating acid sulfate in the soil during construction.
- Topsoil management and mulching practices at Twin Waters ensured that a minimum amount of earth was moved off or onto the site. It is estimated that this practice reduced the extent of earthworks required by 195,000m³.
- Nelsons Ridge is currently exploring the use of recycled materials in road pavements.
- Proposed building materials at St Marys will be selected based on sustainability criteria, including achieving the highest practicable recycled content, potential for reuse and recycling (including packaging), embodied energy, rare natural resources and the environmental impacts of disposal and transportation to the site.
- At St Marys landscaping plans will maximize the reuse of excavated material and construction waste, including excavated material and construction waste collected from a number of other construction sites located within the site.

5. THE SUSTAINABLE AUSTRALIAN CITY OF THE FUTURE SHOULD: DEVELOP SUSTAINABLE TRANSPORT NETWORKS

Public Transport Initiatives

While major public transport initiatives remain the domain of State and Local Governments, early provision of public transport on several DLL projects has assisted in establishing patterns of use within new communities. This has encouraged the development of meaningful public transport initiatives.

- Forest Lake sponsored the delivery of a local bus service, which provided important public transport access both locally and to the city from the start of the project and also established early patterns of use.
- Mawson Lakes will ensure that major and arterial networks are linked to a multi modal transit interchange by 2005.
- Springfield Lakes currently has provision for a future railway line and future bus network and has instigated a local bus service to schools.
- St Marys aims to achieve a residential journey to work transport modal split of 70 per cent private vehicle and 30 per cent other modes (compared to an average of 80 per cent private car/ 20 per cent other modes for conventional residential developments in Western Sydney). Additionally employment centres will aim to achieve an employee journey to work transport modal split of 50-60 per cent private car and 40-50 per cent other modes (compared to existing modal splits of 60-70 per cent private car/ 30-40 per cent other modes). These benchmarks will be promoted through subdivision design (which typically allows for at least 90 per cent of dwellings to be sited within 400 meters walking distance of likely public transport routes) and integration within the wider public transport system.

Walkable Communities

In addition to the provision of public transport, the urban design of DLL developments promotes walkable neighbourhoods and the integration of a mixture of land uses. These two measures are critical to developing self-contained communities with reduced reliance upon cars for transport.

DLL communities are master planned to ensure that residents can minimise internal car trips by using networks of walking and cycling paths that link homes to local facilities such as parks, schools and shops.

6. THE SUSTAINABLE AUSTRALIAN CITY OF THE FUTURE SHOULD: INCORPORATE ECO-EFFICIENCY PRINCIPLES INTO NEW HOUSING

Green housing displays have been undertaken at many DLL communities to try to bring new water, waste, technology and energy outcomes to the fore in both consumers and builders minds.

Further to the energy saving principles outlined in Section 2 there are a number of other initiatives being implemented on DLL communities:

- The HIA GreenSmart Display Homes at Springfield Lakes will demonstrate a number of eco-efficiency principles including waste, water and energy usage. These initiatives comply with the Sustainable Housing Code, Smart Housing and GreenSmart principles. The objective of these display homes is to enable the many eco-efficiency housing principles to be more accessible to different affordability levels.
- North Shore Coastal Village has incorporated eco-efficiency principles in the construction of all medium density buildings through the passive siting of buildings for solar access and breezes, incorporation of eaves, and insulation to reduce heating and cooling expenses.
- St Marys will implement a community education program with a resident's information kit outlining energy efficiency measures and an on-site display home fitted out with resource efficiency features.
- Mawson Lakes has implemented a Home Management System in all homes to provide the ability for residents to control irrigation, air conditioning, lighting and security. This will assist in reducing domestic consumption patterns.
- Forest Lake has instigated a sponsorship program that aims to train up to 50 of its key builder partners under the HIA's GreenSmart certification system.

DLL also provides information to builders and residents to promote eco-efficient housing such as '*Planning Your Home*' at Forest Lake and '*Design for Better Living*' at Mawson Lakes. A consistent national document is currently being prepared by DLL to complement publications such as '*Your Home*' (produced by the Commonwealth Government) which is made available to new residents in DDLL projects.

In addition, the proposed new headquarters for Lend Lease, '*One Lend Lease*', is a commercial building that has been designed according to specific sustainable development principles and aims to change the market perception of Green Buildings in Australia.

7. THE SUSTAINABLE AUSTRALIAN CITY OF THE FUTURE SHOULD: PROVIDE URBAN PLANS THAT ACCOMMODATE LIFESTYLE AND BUSINESS OPPORTUNITIES

The integration of lifestyle and business opportunities within DLL developments ensures the creation of sustainable communities that will accommodate the needs of current and future populations. The layout of DLL communities typically divides the community into a number of neighbourhood units or villages, which focus upon either a mixed-use town centre or smaller neighbourhood hubs.

Lifestyle Opportunities

Some of the lifestyle opportunities offered on DLL communities include:

- Recreational lakes and parkland;
- Sporting facilities;
- Education services;
- Community facilities;
- Retail and commercial facilities; and
- Housing options that appeal to a wide variety of household types and market segments.

Varsity Lakes, Mawson Lakes and Edgewater promote a distinctively urban lifestyle through the density of buildings, range of housing styles, integration of land uses and treatment to the public realm.

DLL has also initiated a number of Lifelong Learning Centres, which provide educational and learning facilities that cater to the community as a whole rather than solely school age students. These centres have become a focus for community development.

- Varsity Lakes has incorporated Life Long Learning into its prototype school, developed with the Queensland Education Department.
- Caroline Springs established the Brookside Centre, bringing together many education providers and providing the whole community with a central resource and focus.
- Golden Grove brought public and private providers together, allowing enhanced facilities that gave the greater community access to facilities they would otherwise not have enjoyed.

Business Opportunities

Local employment opportunities provide a base for communities to prosper and reduce car trips in the long term. In order to achieve this, some DLL communities are located within or adjacent to major employment centres while others seek to create jobs within the new community. DLL has managers dedicated to business analysis and non-residential development activities and is continually assessing market needs. This research provides greater certainty into the type and mix of businesses required to ensure ongoing economic prosperity and sustainability. Key locational requirements are also being identified and incorporated into the planning of the town centres in DLL communities to ensure that they remain attractive and viable business locations.

- Mawson Lakes is sited within a clean industries, technology and education precinct and is indentured to create further employment in this area as part of its community creation.
- Varsity Lakes is located at the geographic centre of the Gold Coast and incorporates mixing of employment, education and residential uses to create a significant employment centre in the Gold Coast community. One of the keys to business growth and sustainability

at Varsity Lakes has been the initiatives catering to the differing demands of business. The business opportunities that have been made available at Varsity Lakes include:

- Home Occupations.
- SOHO (Small Office / Home Office) - These operate in a similar manner to a home occupation but include a dedicated office.
- Small Commercial Tenancies – There are a range of product types including mixed use (residential above) and tenancies located in office parks or similar.
- Larger Scale Tenancies – Large office buildings have been built in some projects to offer large floor areas for businesses in prestige buildings.

Wired Communities

In conjunction with these business opportunities, DLL has introduced wired communities to allow residents to live with the latest technologies and to incorporate the technologies of the future. The establishment of electronic communities also allows the community to better communicate, which assists with making initiatives such as car-pooling more viable.

- Mawson Lakes will eventually be a wired community.
- Newington has the infrastructure in place to allow the best technologies to be used for the community to use the technologies of today and the future.
- Springfield Lakes is part of the Apple community of the future.
- Varsity Lakes is wired with a high-speed broadband communications link to allow future residents access to the best technologies of today.

ADDITIONAL INFORMATION HELD BY THE COMMITTEE

ATTACHMENT TO SUBMISSION NO. 66

ATTACHMENTS, APPENDICES AND PHOTOGRAPHS PROVIDED WITH SUBMISSIONS
ARE HELD IN THE COMMITTEE OFFICE