Sustainable Cities 2025

Submission by Lend Lease
To
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Contents

1. Our Frame of Reference

This paper draws on and enhances Lend Lease's comparative advantage in understanding sustainability within the Australian context. This advantage can be defined in terms of our national identity and operation within the built environment, our partnerships with agencies and a working knowledge of current policies, the dissemination of national and international knowledge in the realm of development and finance, and, especially, in our active participation in the design, development and construction of Australia's built environments.

"There are two things in life. You can be out for the maximum amount of profit you can possibly squeeze from your effort, or you can aim at a reasonable profit and have a feeling that you leave something behind."

Dick Dusseldorp, founder and first chairman of Lend Lease, at the Lend Lease Corporation AGM in 1988.

The founders of Lend Lease had a genuine desire to make a worthwhile and profitable contribution to society through everyday business activities. Principles such as wealth distribution, social change and community building continue to guide the way we do business around the world and define our reputation.

In contributing to the Sustainable Cities 2025 Inquiry, Lend Lease seeks a higher quality of life for all Australians, together with more sustainable national development and built environment. We aim to place Australia at the forefront of sustainability thinking, practice and solutions.

1.1 Our Background

Lend Lease is one of the world's leading real estate companies. In a highly fragmented market, Lend Lease provides a full spectrum of real estate-related services to clients across all major markets and sectors. We deliver specialised services and solutions ranging from investment management through to commercial credit services, development, financing, construction and project management, offering clients unique value by ensuring all their real estate needs are met.

Lend Lease provides these services and skills through its two core business platforms – Real Estate Investments and Real Estate Solutions.

Real Estate Investments is one of the largest real estate investment managers in the world with A$90.9 billion [€51.8 billion, GB£32.7 billion, US$51.8 billion] of assets under management. Lend Lease's investment programs cross the risk/return spectrum for both equity and debt capital, in the public and private markets.

Lend Lease's Real Estate Solutions business offers property-related services to clients involved in the creation, improvement or management of real estate assets. This includes expertise in development and capital raising, program management, project and construction management, design, engineering, as well as facilities and asset management across all sectors. The business includes Bovis Lend Lease, a leading worldwide construction and project manager; Actus Lend Lease, a developer and manager of US military housing; and Delfin Lend Lease, one of Australia's largest residential/urban community developers.

Listed on the Australian Stock Exchange, the Lend Lease Group operates in 43 countries on six continents, with a significant presence in Australia, Asia, Europe and the United States.

Our involvement with the wider community through the diverse components of our business, projects and activities is relevant to the investigation into Sustainable Cities 2025.

1.2 Why We Are Responding

Lend Lease recognises that it is in our long-term interest to give something back to the communities in which we live, work and operate. We support social change, not just corporate philanthropy.

Lend Lease is dedicated to meeting the social, cultural and environmental need for complete, sustainable communities. Our philosophy is to adopt a flexible approach to urban regeneration and to include communities in creating a vision for their future.

By bringing a culture of positive partnership to the planning, design, development, construction and future of large-scale projects we are able to maximise the outcomes and bring our philosophy to life.

Our community development teams embed themselves into the community at the earliest opportunity, facilitating the creation of effective and inclusive long-term relationships with stakeholders. By respecting the public and private sectors as well as the local community as equal stakeholders, our community development teams are able to inform the design process of the community's needs and maximise the benefits for all concerned.

The ensuing partnerships become the catalysts for change, enabling communities to meet their own aspirations, improve their own prosperity and create a 'win-win' approach.

"Exactly what does sustainable business practice involve? The most comprehensive definition encompasses all aspects of a corporation's behaviour – the way it engages with entities both inside and outside the firm. It includes such things as the way it treats its shareholders: the dividends and capital growth it generates for them, the degree to which it stands accountable to them, as well as the extent to which it encourages their involvement in corporate governance. It also includes the way the company recruits, rewards, develops, and respects its employees; the quality, safety and security of the working environment it provides for them, and the extent and methods by which it encourages their participation in the firm. Firms acting sustainably also recognise obligations to external parties – to clients, partners, and suppliers they owe a duty of fair treatment, the best distillation of which, Dusseldorp believed, was to do unto others as you would have them do unto you.

Finally, socially responsible businesses recognise that they have obligations to the local community, wider society, and natural environment in which they operate (...) Why, some might ask, does that even matter? It matters because running a sustainable, socially responsible business is not a matter of altruism. Consumers, investors, employees and regulators are the people who make up that amorphous group, 'society', and if they demand safe products made in an ethical way, then it is in both the long-term and short-term interests of business to satisfy those desires."

Finding a Common Interest: the Story of Dick Dusseldorp and Lend Lease – Lindie Clark

1.3 Sustainability – The Lend Lease View

Lend Lease is committed to fostering sustainability in all our activities and developments. The company prides itself on its willingness to shoulder the responsibility of making a difference. Our objective is to ensure a balance between financial, environmental and social goods.

Our sustainable development process is predicated on total stakeholder involvement. This ensures that we capture innovation, manage costs, and deliver greater ongoing benefits for all.

Major Areas of Focus

Economic: Optimise capital relative to performance outcomes; improve operating costs; consult authorities to assess best possible scenario for both current and future needs.

Social: Improve liveability, security and community connectivity. A good social outcome is the reduction of the environmental impact of buildings, better planning for transport and community hubs and the creation of sense of place.

Environmental: Reduce energy and greenhouse emissions; reduce water consumption and effluent flows; improve internal environmental quality (thermal, acoustic, air and light); reduce materials consumption by focusing on materials with lower environmental impacts.; provide for and protect the quality of the urban environment where our projects include, impact or interact with it.

Guiding Principles of Sustainable Design

The following key design principles drive the delivery of all Lend Lease built products within the Australian context today. They respond to an intrinsic understanding of the Australian condition generated through over 50 years of operating within this context and the need for adaptability to the changing structures of Australian society. Lend Lease has responded to the increasing challenge of the sustainability agenda, both in this country and abroad and over several decades, by adapting its strategies to the changing situation.

Lend Lease seeks to be a good corporate citizen and community member. We pride ourselves on our involvement with the community, which has given us an understanding of community needs and the ability to achieve the complementary benefits for the investor and the public alike. The Lend Lease community commitment is implicit in the following key design principles.

Adaptability not Ubiquity.

Despite a growing trend toward urbanisation, every urban setting is unique in location, structure, assets and purpose. This is particularly true of Australia, a nation that sees urbanisation emerge in diverse environments, from the tropics to the arid or the coastal. Lend Lease operates in all these locales with a policy of adaptability that no two solutions should be the same - a consequence of understanding the local environment and knowing community needs and aspirations.

Adaptability is key to sustainability because mechanisms that are best-fit to a local environment enable efficiency of infrastructure, mobility and use. Economic, social and environmental effectiveness can thereby be generated

Strategy not "Grand Plan" Vision.

Overarching vision plans and generic guidelines are not as conducive to implementation as strategic plans for intervention. That is why we seek a shift away from "total vision" plans, preferring strategic intervention.

Strategic approaches are significant to sustainability for two primary reasons. In the first instance, they can enable change within a relatively short timeframe. Strategic interventions do not necessitate timely and certainly costly land acquisitions. Further, due to their compact nature, less "red tape" may be required for implementation. In the second instance, strategic intervention can provide a catalyst for change by providing model projects within communities and directing sensitive growth.

Multi-Dimensional Approach or the Sum Is Greater Than Its Parts.

Partnership/relationship opportunities with governments, agencies, infrastructure providers, other investors or developments, community groups and others leads to greater integration across the physical environment, infrastructure networks, finance, institutions and social activities. We seek collaboration and transparency between all stakeholders.

Improved integration is essential to sustainable urban development because provision of infrastructure more than once or incompatible service cannot be sustained. Streamlining and efficiency is the key to successful sustainability.

No Boundaries.

Unlike political boundaries at a state and local level, the private sector acts nationally. We seek to actively contribute across a variety of built environments and ecosystems in response to rather than constrained by, the local context. As such, we are able to transfer knowledge between and across political territories advancing knowledge and experience of sustainable issues. We are able to facilitate transfer of know how from community to community in the form of best practice, education and model projects. The transfer of knowledge is essential to the ongoing advancement of sustainability in this country.

Moreover, at Lend Lease we also work internationally, allowing us to bring a different context and alternative structures to development issues and projects. In the current global situation, this is crucial to the continued growth of Australia's competitive advantage.

Defining Sustainability

We acknowledge the Bruntland (WCED, 1990) definition of sustainability. In applying this in our business we have adopted the functional definition as

"Development of the built environment which seeks to balance ecological footprint with social inclusiveness whilst providing relevant economic benefits resulting in sustainable growth to current and future generations."

"Current and future generations" refers to both internal and external stakeholders to our business and the users of our buildings and developments.

The Role of the Built Environment in Achieving Sustainability

Implicit in Lend Lease's understanding of sustainability is a breadth to the definition sometimes forgotten. We believe a sustainable city is not just a green city. A sustainable city is one which is liveable, competitive, well governed/managed and financially viable[1]. The built environment holds an integral position, be it the outcome or the process, in achieving these four components of sustainability. The following outlines the built environment's role in achieving these four aspects of sustainability.

According to the World Bank, "Liveability is the household's criterion for a city that works." The liveable city is therefore about an equitable, healthy and safe urban environment.[2]

The agenda for improving liveability includes achieving greater equity, creating a healthful urban environment, enhancing personal security (minimising crime, violence, traffic accidents) and making cultural assets and recreational facilities available to all. (World Bank, "Pursuing a Vision of Sustainable Cities.)

The built environment is specifically related to market flows of the competitive city in it's delivery of infrastructure such as transport, communications and housing. Complementary, the delivery of infrastructure has the responsibility to discourage diseconomy created by congestion and pollution.

Building liveable cities requires a buoyant, broad-based growth of employment, incomes and investment. A competitive city is one in which an efficient output of investment, employment and trade respond dynamically to market opportunities. Only one of the many components creating a competitive city, the built environment, is specifically related to market flows of inputs, including transport, communications and housing, while discouraging diseconomy created by congestion and pollution[3].

Good governance is a very high pressure for a sustainable city. An integrated approach is essential to the achievement of a cohesive sustainable system. With regard to the built environment this translates to agencies and private companies working together logically and clearly, ensuring that the left hand knows what the right is doing, and that they are complementary.

Creating a good built environment through sustainable objectives increases value at local, city and regional levels. This value maintains and enhances the economic viability of an are or region.

The built environment thereby plays a holistic role in the determination of sustainable cities. More than 'green architecture and/or planning' it contributes to viability, the competitive city and the financially viable city - informed by (with the potential to guide) good governance.

[1] This approach concurs with that of the World Bank "Pursuing a Vision of Sustainable Cities" pp34-38. www.worldbank.org
[2] Ibid
[3] Ibid

2. Response to the Terms of Reference

The Terms of Reference establish a strong framework for the process of assessing and setting forward direction for urban settlement. The five points are set out as:

1. Review the impact;
2. Look at the reasons for this;
3. Propose a model for the future;
4. Ensure strategies work towards the ideal model;
5. Put in place the statutory framework to implement the plan.

The strong process inherent in the structuring of the Terms of Reference is commendable. There will need to be a careful control of the investigation to ensure that the simplicity of the process does not allow important elements to be missed along the way.

As an example, the economic impact of development is rarely holistically assessed, due to the siloing of Authorities and the private sector. A total financial impact needs to be used, which currently does not seem to be occurring – e.g. public transport, economic assessment does not consider the health and productivity costs of traffic congestion or the economic cost burden on fringe suburbs for the provision of multiple cars.

The responses to each of the Terms of Reference are contained below, and over the following pages.

2.1 The Objectives of the Committee

As stated, the Committee will enquire 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

The economic impact of sprawling development is not considered within the statement. In our experience the economics are amongst the easiest elements to quantify, and will be required to establish one of the baseline assessment conditions for justifying a position on the topic.

This should include specific reference to the provision of transport infrastructure (eg: roads vs. rail and other). A key problem is that assessment typically considers issues in silos at the expense of the taxpayer and the environment. If an overarching governmental approach is taken and other aspects such as health savings and productivity costs are factored in as income into transport, a more likely positive investment could be realised. Within the PPP structure, private companies have no access to the cost savings from other parts of government. This should also factor in the hidden financial burden on fringe vs. inner ring households, in the need for additional private transport, estimated by TEC as upwards of $200,000 per additional car per household.

2. The major determinants of urban settlement patterns and desirable patterns of development for the growth of Australian cities.

While in support of growth, we must now question traditional developments that contribute to sprawl. Rather than accepting social and economic biases that have determined urban settlement patterns to date, we now have the forethought, knowledge and ability to direct new development areas to include environmental sustainability aims.

For instance, contiguous or infill development and/or compact town centres in new developments, rather than traditional green field development, can preserve valuable open space or agricultural land. Governments have the ability both to monitor regulatory requirements to achieve this end and to create incentives.

3. A "blueprint" for ecologically sustainable patterns of settlement, with particular reference to eco-efficiency and equity in the provision of services and infrastructure.

Establishing a blueprint for development is a commendable goal, though it should be recognised that settlement exists, and the proportion of new to existing development will be relatively minor over the timeframe of this study and its implementation. As such it should be viewed in context of how sustainable practice can be introduced into existing environments, in a positive and adoptable manner.

Care should be exercised to ensure that any blueprint does not result in increasing levels of compliance born solely by the taxpayer. This point and its elaboration must be considered holistically with other government mechanisms to defrag the translation of ecological and social repair from a government cost and responsibility to that of the taxpayer. Particular care is relevant here as socio-economic demographic of outer ring development is less advantaged than inner ring.

4. Measures to reduce the environmental, social and economic costs of continuing urban expansion.

Critical to the assessment of unsustainable impacts is the establishment of measurable key criteria that encompass the economic, social and environmental aspirations of sustainability in their entirety, and not just the achievement of "green" urbanism.

These criteria must exhibit consistency and credibility in order to be effectual.

5. Mechanisms for the Commonwealth to bring about urban development reform and promote ecologically sustainable patterns of settlement.

There are a number of ways for the Government (Commonwealth, state and local) to persuasively promote ecologically sustainable development. Crucial to this promotion is cooperation between the differing tiers of Government.

The mechanisms available include developer education (industry led change), community awareness and education (consumer led demand), statutory controls (regulatory restriction), financial incentives (concessions, tax breaks, rebates) and financial penalties (charges, penalties). Though education is the ideal way forward, financial and statutory influences offer the greatest opportunity for progressing the outcome.

A critical factor in influencing attitudes is taxation legislation, which is wholly in the hands of government. Tax breaks and incentives for both homeowners and developers to invest in eco-efficiency and social development would be a possible approach to the issue.

The economic rationalisation of government (e.g. corporatisation of utilities) provides either a constraint or opportunity to the process. Quasi-government authorities' current structure does not adequately support sustainable development initiatives. Measures should include consideration of pricing structures of utilities in their corporatisation. Particular emphasis here on the energy provision and the barriers created as a result of the quasi-privatisation of the sector (eg: integral energy owns wires and infrastructure in west Sydney but has no incentive to improve or pay for DSM as the tariff charges are fixed by government).

Terms of reference should also consider the legislative/regulatory process and how it creates bottlenecks and inconsistencies between local, state and national interests (e.g. national progress in resource extraction, fundamental to the national interest, is hampered by state and national politics and legislation).

3. Response to the Discussion Paper

The seven components listed as visionary objectives for the Australian Sustainable City establish a strong grounding for the discussion.

Our assessment is that while being very relevant to the objectives of the investigation, the points primarily focus on the "green" aspect of sustainability. Our individual responses within each of the components raise additional issues with regard to the economic and social aspects of sustainability.

Furthermore, we believe some additional components, inadequately covered within the outlined seven components, could be discussed. These points are:

8. Provide the social infrastructure to support the lifestyle, aspirations and wellbeing of the community, both in physical facilities and ongoing program management.

9. Manage density, both in regard to number of dwellings and household density. This would ensure a diverse social mix, an active and safe environment, and the catchment to allow community and civic facilities to be appropriately patronised.

10. Establish natural disaster management systems to mitigate impending disasters and respond in both the short and long-term.

The Objectives of the Discussion Paper

3.1 Preserve bushland, significant heritage and urban green zones.

The characteristics of the Australian environment are very much aligned with the bush and the bushland character. The ability for the ongoing development to continue while maintaining its bushland setting, and for urban redevelopment to occur while retaining, enhancing and/or creating a higher quality setting would be beneficial to the city.

An important consideration undefined within the discussion paper is the difference between open space for people (active and passive recreation) and green zones (interpreted as conservation areas). We believe that these two areas can and should be considered as co-existing in the same location. The integration of open space for active and passive recreation, biological connectivity, conservation, water management and circulation creates an environment where the whole is greater than the sum of the parts.

Our responses to the questions below assume that green zones can include active and passive recreation, biological connectivity, conservation, water management and circulation networks.

Questions for Consideration

- **Does the inclusion of green zones within city planning result in further urban sprawl, which has a greater detrimental effect on the environment by encroaching on more surrounding bushland?**

Green zones are important within the urban environment for recreation and perception, as well as biological concerns. Green zones can be used to lift density by putting more people in close proximity to good public open space and reducing the need for private open space. Development should look at open space to fund other intensification initiatives.

The open space should provide linkages throughout the urban area. These zones should "double use" areas that are non-buildable due to other conditions such as water management corridors, trunk infrastructure or maintenance of the character (ridge green zones). This will minimise the loss of space for green zones, while creating the opportunity for improved amenities.

- **What are the possible impacts of either increasing or limiting the proportion of bushland and urban green zones?**

Taken at face value, containing green space limits the opportunity for recreation, biological corridors etc, and increasing green zones limits the scope for urban development.

Yet the real issue that should be considered is the contribution of green spaces to the urban environment. How can improved green spaces provide the opportunity for increased density, while still providing a high quality environment relevant to the needs and aspirations of the community? Can density be distributed to areas with increased green space, achieving both the development capacity and greater quantum and quality of green areas?

Another factor when considering green space has to be the real needs of recreational activities. Are increased quantities of green zones achieving what they need to? The needs for recreational use should be looked at in both open space active and passive recreation, and cultural recreation. The programmatic elements of this should also contribute to a better space usage by implementing a management strategy, rather than purely expanding quantum of space.

The maintenance of open space is increasingly an issue in developments. This can be between the developer, local councils, and in some of our larger developments, state and national land managers such as National Parks, Forestry and the relevant water catchment agencies. The ongoing issue is the provision of dedicated open space that needs to be maintained to continue its relevance to the community. For character and amenity, the desire is to increase green space area and for maintenance, the desire is to limit area. The degraded environments throughout cities in Australia are often hard to maintain, difficult to access (for users and maintenance crews) and/or irrelevant to the community, creating a lack of care. The stretched budgets of the maintenance groups should also be addressed.

A potential solution to at least part of the maintenance issue, which also ties to the next question on multi-use corridors, is the landscape design and materials selection. Too often open spaces are designed to create an idealistic, rather than naturalistic environment. The selection of native species may provide a lower maintenance impost, provide improve biological conservation corridors and be in keeping with the bushland setting that represents traditional Australian living.

- **Can green zones be multi-purpose – serving the recreational and social needs of city dwellers while providing habitat and environmental benefits for native flora and fauna?**

The best opportunity to gain benefit out of the open space network is to provide a multi-use corridor system, so that it remains relevant and gains high levels of use and ownership from the community. Green zones need to be connected, rather than parcelled into disparate individual places. Issues of width, character, planting type and planting density will be important. Water is a key part of the biological network, promoting a link to the discussion on water management practices.

Within a number of Lend Lease projects we have found that striving for this integrated approach has achieved benefits for all stakeholders.

The difficulty is finding real examples of successful multipurpose corridors, while degraded corridors within urbanised areas are numerous. Much of this impact is due to the detrimental effects of urban runoff contaminating the conservation area. Perhaps the greatest challenge lies in achieving the biological values within the corridor.

To adequately address the approach for a multi-use corridor, including habitat and biological connectivity, we need to consider the systems that feed the corridor, to the very source of any runoff. Water, as potentially the greatest contamination carrier, should be dealt with as a holistic system addressing quantity, flow rates, speed, floatables, suspended solids and dissolved contaminates. This should include householder level strategies, the lot and street runoff collection, the ability to remove floatables and suspended solids throughout the system before reaching the corridor, and for the water to have the appropriate treatment to break down dissolved contaminates throughout the network. Lend Lease has been investigating such strategies that we would be happy to discuss further with the working group if it is seen as relevant.

As previously noted, the function of open space as recreation needs careful analysis. The works that Lend Lease is involved in are increasingly revealing differing demands on recreational facility provision that many of the traditional assessment methods fail to address. Much of this has to do with cultural, rather than physical recreation, and the management of activities rather than the provision of large scale single-use areas. The inquiry should look at how this is addressed, which may raise significant issues in regard to development contributions, area provision and community consultation processes.

- **Is it appropriate to provide incentives to encourage partnership arrangements with land holders and developers to preserve remnant vegetation on private lands?**

The benefit of maintaining remnant vegetation should be outlined to the developer and the public, to allow a better understanding of its value. The issue should be addressed within the incentive process for the developer, although a real assessment of the value of the vegetation should be undertaken to protect that of significant value.

Within some of our recent community consultation sessions (for the ACT Bushfire Non-Urban Land Use Study in particular) the representatives of a number of recreational groups have raised concerns over the conservation values placed on open space. Many recreational pursuits are being restricted because of their impact on recreational areas, though they are vegetated open spaces rather than those of conservation value.

Another major issue to be addressed if accessible open space is to be encouraged within private ownership, is that of insurances. The risk of litigation to a private owner will typically raise such difficulties that it will undermine any attempt to further the best social and civic outcome.

- **How do we ensure that preserved sites of built heritage are culturally valued and appropriately integrated into planned developments?**

The first issue is the definition of "heritage" and the rules governing conservation. The second is the level of adaptive reuse which will degrade the relevance of the item or site. The third is the question of ownership and management of the item or site, and the incentives to ensure the integrity is kept over the longer term (a likely combination of up front incentives and longer term ongoing benefits such as tax breaks). The inquiry should be assisting the Government in creating improved assessment of items deemed to be heritage, and differentiate between heritage and old. Too often an old building or feature is framed as heritage as a screen to NIMBYism (Not In My Back Yard).

If the government is serious about achieving increased development within existing urban environments to achieve sustainability goals, then a strategy that addresses intensification and combats the NIMBY attitude needs to be developed. We must also address items that have significant heritage elements and treat them with the appropriate reuse strategy. If items are not significant they should not hamper the best sustainable outcome.

- **How do we ensure that public green zones are integrated into new developments?**

The provision of green zones is already in part ensured through legislation. But issues about the use, quality, relevance, distribution and the perception of the space and activity as public rather than privatised remain. The strategy needs to have performance objectives that drive the multi-use of corridors and promote the appropriate biological solution that addresses the particular localised condition. After all, no one answer will solve the problems of the differing, diverse conditions throughout Australia.

Other Questions that should be raised include:

- **How is the open space and water management related?**

How do we ensure that the strategy for open space is developed in concert with that of the water management system?

- **Movement corridors for people**

The movement of people through the open space corridors is important. For a movement corridor to be successful it needs to be safe, relevant, efficient and have a pleasant and enjoyable character. As such it has the potential to be part of the open / green space network. The creation of local circulation systems for pedestrians and cyclists presents one of the best opportunities for reducing the dependence on private vehicles.

- **Value enhancement to development**

It is recognised that the value of land is increased by its proximity to open space. One only needs to review sales figures for properties that overlook parkland, a golf course or any kind of water to realise the premiums. It may well be in the Inquiry's best interests to look at capitalising on this to achieve its objectives.

- **Heritage as a sustainable use?**

As outlined previously, "heritage" should be differentiated from "old". When considering sustainability, the tokenistic and oft compromised adaptive reuse of 'heritage' buildings may not provide the appropriate solution. If an item has true social, cultural or physical significance, then it should be sensitively and appropriately protected within a relevant context.

3.2 Ensure equitable access to and efficient use of energy, including renewable energy sources.

Questions for Consideration

- **How might we implement a shift from the existing large-scale energy generation and distribution infrastructure towards an alternative model?**

Much of the discussion around 'sustainable energy generation' uses an either/or scenario. The reality is actually mooted in the question – a transitional process, which is likely to have a strong relationship to the existing distribution network. For electrical generation (often the simplest to consider) a grid-linked system at any scale of development could be advantageous to pursue, given the appropriate regulatory framework.

If the authorities and/or the privatised infrastructure corporations are encouraged to participate, we believe that the best outcomes will be achieved through developments incorporating energy producing elements, whether that be solar, hydro, heat pump, wind methane, or any other of the various existing or future production types. Any development can then look at the appropriate energy generation methodology for its scale, siting, and use. Examples might be solar panels on the roof of a house, cogeneration systems for a major building complex, or hydro for any dam construction. The localisation of generation also has the potential to reduce the energy loss involved in distributing the power.

That production method could then feed into the main grid generating credits and be drawn for use as debits, with some sort of service charge for access to the grid. This methodology provides a surety of supply and generates a far greater reliance on sustainable generation than that of authorities or agencies developing standalone systems (not that this should be forgotten). There is some ability to achieve this now, but the blockages provide major issues for developers such as Lend Lease.

This scenario might be implemented through either incentives (e.g. taxation rebates, grants, other carbon credits) or enforced in development controls. Alternatively it could be implemented through legislation. This would target existing electrical retailers to provide a certain percentage of the electricity they sell from small scale off grid power generation plants, encouraging investment in projects such as the Rouse Hill development we are currently planning in Western Sydney. These targets could increase annually.

We have found that the disincentives and structural barriers created by the government in the semi-privatised structure of the energy sector are a major issue in implementing these strategies. This issue is covered in the third point of this section.

The current incentive systems are effective at the householder scale, and for very large industrial producers (such as those at quarrying scale). Any review of incentive systems should target a broad spectrum of stakeholders. As a major developer, we cannot adequately access the incentives that are currently in place, yet have some of the best opportunities within the community to influence the changes.

The provision of new energy production facilities (traditional power stations) is by necessity scaled to be able to cope with the increased demand projected through the lifespan of that facility. This means that the cost of producing energy when a facility is first commissioned is incredibly high compared with the optimal capacity production cost. A study by Rocky Mountains Institute has developed a valuation methodology that suggests that decentralised generation and distribution capacity at the end of a system is worth 4-5 times the value to the utility as it reduces the need for over sized one off large additions to the whole system (RMI,2002). These savings should be offered back to organisations happy to facilitate integration of micro-generation on sites.

- **How can the uptake of renewable energy for residential and commercial properties be promoted?**

The difficulty with renewable energy is the cost imposition. Currently it is only financially viable in select situations, and we have found this is only due to cost sharing and justification with other project objectives.

In our view, one of two things needs to occur to see an increase in uptake. The first is the ideal scenario - a drop in the cost. Unfortunately this is unlikely to occur until sales volume increases resulting in more uptake – forming a "chicken and egg" situation. The second method is to provide additional incentives. These incentives may not be direct grants but indirect incentives, such as additional floor space area (FSA) for best practice commitment, taxation rebates etc.

To reinforce the ongoing benefit of renewable energy, we suggest the government provides support through household tax incentives such as depreciation or deduction for green investments, tax-free interest accrued from savings and government mortgage subsidies for "green houses" and units.

- **What are the impediments to using renewable energy sources in residential, commercial and industrial areas and how might these be addressed?**

Cost constraints are the obvious main impediment, generally being a controlling factor unless development is located in a remote area with insufficient infrastructure. The disunity between developers of renewable technology/energy and network providers through the structural barriers imposed by a semi-privatised, semi-regulated sector is an added complication. No network provider makes renewable technology or energy, so embedded generation becomes a risk to their business. In this regard we regularly come up against additional requirements, which in our experience means an extra cost in the order of at least 50% on top of embedded generation to implement. Network providers do this to discourage uptake. This must be addressed.

The structure of the regulations governing the relationships between developers and building owners such as ourselves, with building occupants and energy providers creates major impediments to the implementation of improved energy performance. These pieces of legislation are also inconsistent between states. To address this, the barrier of 'Business as Usual' leasing agreements needs to be changed to allow property owners to capture energy savings in tenancies (e.g. green leases).

- **Should renewable energy generation be promoted at the single dwelling level or across city regions?**

This question implies that the answer is one or the other. It should be considered at both levels, and the in-between scale of community generation.

- **Are there economic, and hence social, implications of a city increasing its use of green power and developing new complexes which are predominantly self-sufficient in terms of energy generation?**

Simply put, yes there are implications. But what are these implications and the important factors to consider? It would be relevant to investigate the sunk costs (environmental, economic and social) of the existing system and compare these to a smaller more flexible embedded system. The environmental costs of current energy use are not just measured in terms of greenhouse effect and money. The energy sector in Australia is second only to agriculture in its use and pollution of water resources. This should also be considered as a social cost opportunity for adoption of embedded green technology.

- **Should higher efficiency standards be mandated for all new dwellings, appliances and business operations?**

The objective of achieving higher efficiency standards in buildings is positive and to be pursued. This should however be recognised as limited in its impact. Various studies have indicated that we may be able to achieve 10-15% improvement without significant investment, which may be better on the green scale, but does not necessarily meet the full sustainable definition.

Though increasing efficiency at the building scale is necessary, without addressing supply and production the problem will not be addressed. Current energy efficiency at the household and appliance scale has been significantly increased in recent years, but household formulation and size is far outstripping efficiency gains. Thus, addressing this alone will only have negative economic impacts on the tax paying population. Improving the sustainability in the production of energy will produce a far greater positive impact than that achieved at the household level.

- **How can residential and commercial developments incorporate renewable energy generation into planning and construction?**

This is discussed at length in the preceding pages. The additional opportunity is to broaden terms of reference for organisations such as SEDA and BCSE in providing assistance (in terms of both manpower and money) to developers (like us) to undertake strategic and feasibility assessments of opportunities at the urban scale.

- **To what extent should public transport systems seek to change to renewable energy sources?**

This is further discussed under the fifth point of the discussion paper dealing with Transportation. In summary, the fuel question is really a distraction to this inquiry. The public transport system should of course seek to operate with improved, possibly renewable, cleaner fuels. But it seems to us that increasing the use of public transport at the macro level, rather than looking at the efficiency of the transport at a micro level would obtain more sustainable gains.

3.3 Establish an integrated sustainable water and stormwater management system addressing capture, consumption, treatment and re-use opportunities.

Questions for Consideration

- **Should cities of the future be looking to develop more localised small scale systems of urban water management?**

Through our work, Lend Lease has found that the ideal approach is to look at the water management system as a hierarchy of elements. The inquiry should be approaching the issue of water management as a total system, rather than looking at levels in isolation.

The water management system should be looked at, at all scales – household, street, neighbourhood, village, town, city and region. With stormwater the (extremely) simplified view may be:

- **Household**: Initial detention and filtering
- **Street**: Capturing of floatables, preliminary transpiration removal of contaminates through swales, GPTs and overland flow areas
- **Neighbourhood**: larger ponds for removal of suspended solids, nutrient expiration, macrophyte zones
- **Town**: major creek systems and bulk treatment (if necessary)
- **City**: major waterways and water harvesting
- **Region**: catchment management

- **What scale of residential water management systems is most efficient and sustainable?**

As described above, this should be investigated as a total hierarchy rather in isolation, with a single solution.

- **How do we transform existing developed city areas into more sustainable water management systems?**

The traditional engineering driven water management within urban areas has resulted in large swathes of land quarantined for stormwater, typically carried through concrete lined culverts. This presents a fabulous opportunity to develop new, best practice, sustainable systems within the existing dedicated corridors. The opportunity is to naturalise these corridors, providing a much higher level of water quality management, and in many cases some level of control over quantity and velocity. The naturalising of the corridor could also allow for increased green space and recreation zones, contributing towards the first area of the discussion paper – dealing with bushland, green zones and recreation.

The corporatisation of the utility providers has again lead to a reduction in capital reserves for upgrade projects to all infrastructure. This needs to be addressed.

- **How do we encourage areas to abandon existing waste water systems, which may discharge to the ocean or other waterways, in favour of alternative waste water treatment methods?**

As discussed, we believe that the appropriate approach may well be to take advantage of the existing wastewater network and the embedded energy in the existing infrastructure to provide the best sustainable solution. If an appropriate hierarchy of treatment and management is implemented then potentially discharging to the ocean or other waterways will become a far less significant issue. The recharge from runoff to the waterways should also be considered, as the environmental flow regime is an important factor in the sustainability of waterways.

- **What incentives or market-based instruments might be appropriate for residential and commercial enterprises to encourage responsible water consumption and re-use?**

Meaningful tax incentives and deductions as discussed are the obvious solutions. Alternatively a truer process of user pays could be implemented.

The financial incentives do need to be meaningful. As an example, the $100 rebate from Sydney Water to households to install water collections systems worth ten to fifteen times that amount is meaningless. The rebate to households or communities should be of a scale consistent with the amount it would cost the water authority/corporation and the government to develop and maintain the water network should the conservation and quality systems not be met – such as the cost impact of required dams if water conservation targets not be achieved.

- **Are more standards and guidelines needed for new development to minimise waste and storm water and to maximise capture and re-use opportunities?**

This question should be rephrased as "what standards and guidelines do we need to maximise the quality and efficiency of the total water supply and management network?" Some of the existing controls act as barriers to providing the best water management systems (e.g. the online/offline basin controls for urban development affecting existing creek systems). The likely outcome would be a new set of guidelines and standards that promoted the best result, which, given the diverse Australian environment, may well need to be regionalised and flexible in their application.

<u>Other Questions that should be raised include:</u>

Some other questions that should be considered either individually or as subsets of existing issues include:

- How much are we prepared to pay to pollute and degrade oceans and natural waterways to maintain the present system?

- What is the contribution to urban environment of water systems, in terms of value, open space character and biological connectivity?

3.4 Manage and minimise domestic and industrial waste.

Questions for Consideration

- **How does a sustainable city bring about attitudinal change and encourage its inhabitants to accept greater responsibility for waste minimisation and management?**

The management of waste is in danger of becoming one of the forgotten elements of sustainable development. Lend Lease believes that stakeholder dialogue is the best way of bringing about behavioural and attitudinal change. The term 'stakeholder' refers to any party who is affected by an issue. Whether approached from an economic or environmental perspective, everyone has a vested interest in waste and resource management issues. As such, stakeholders in these issues may include:

- Members of the public affected by a local waste initiative.
- Industrial and commercial waste producers.
- Government bodies concerned with policy development.
- Local authorities.
- Waste management companies.

A number of management and policy options for waste are increasingly available, which impact upon various sectors, groups and individuals. There are a number of factors that make waste the ideal arena for using stakeholder dialogue. These include:

- The complexity of issues that exist on a micro and macro level.
- A lack of ownership of a problem that everyone is responsible for creating.
- The growing number of stakeholder groups with a wide range of views and values.
- Uncertainty in terms of the potential environmental implications.
- Perceived and actual commercial and other interests in the general outcome.
- Lack of agreement and leadership on the best way forward.
- Lack of general awareness around the long-term repercussions of decisions regarding waste management.
- Growing public awareness, concern and campaigns on a wide number of issues - including the planning and siting of waste facilities.

As an issue that will ultimately affect us all, we believe the time has come to change our approach.

The process should be designed and managed to meet stakeholders' needs. A successful outcome will result when a wide range of key stakeholders buy into the process.

Reducing waste saves not only on disposal costs but also on the cost and usage of raw materials and production costs. Minimising the quantity of waste produced is seen as the most desirable option in the sustainable waste management hierarchy. By adopting wide-ranging education and waste minimisation and awareness raising programs, the government can bring about important attitudinal change.

It should be noted that there will be a cost associated with these efforts, both in terms of time and resources. Experience shows that this effort must be maintained and the message continually reinforced if such programs are to be successful.

- **What types of industry are appropriately located within cities, and how do sustainable cities respond to production processes and waste treatments that exist to meet city consumption patterns but occur outside of city limits?**

This question implies that only selected industries can appropriately be located within most cities. If a proper and well-developed waste management strategy is implemented however, the acceptance of most industrial facilities should be achievable. The need for integrated industry into a local community is considered a well-planned model with various community benefits such as employment, good transport and other social aspects. The challenge is to provide an effective, adequate and appropriate operational framework for these industries to exist in this environment.

- **What strategies are appropriate to encourage eco-efficiency and the reduction of domestic waste?**

Governments at various levels have implemented programs to accelerate the drive away from landfill to more sustainable waste management practices, by proposing the introduction of statutory recycling and recovery targets for Municipal Solid Waste. This has been combined with economic tools and other legislative devices such as landfill fees and requirements from extended producer responsibility. Australian governmental bodies should consider using legislation to set specific targets for reducing landfilling of the biodegradable fraction of municipal waste. To achieve the targets set by Governments it will be imperative that the Local Councils work together in the development of recycling and recovery initiatives.

- **What strategies are appropriate to encourage eco-efficiency and the reduction of industrial waste?**

The policy framework for most States & Territories is generally based on regional factors, such as topology and the current waste management infrastructure. However, several common policies can be found in all the strategies:

- A commitment to reducing the quantity of waste going to landfill.
- A need for improvements in markets for waste products, to enable an increase in materials recycling - 'Closing the Loop'.
- A requirement to deal with the acknowledged growth in waste.
- The creation of voluntary or aspirational targets for recycling.
- The provision of waste management options which balance the management of waste.
- Waste minimisation and reduction as a way of life rather than a short-term initiative.
- Encouragement of a partnership approach between all stakeholders.

The waste hierarchy of reduction, re-use and recycle, has been very widely adopted at a domestic level. But only in the last few years have schemes been initiated at an industry level.

The Proximity Principle is an important factor in the assessment of waste disposal both in an urban and rural context though are more applicable in a rural context. Waste should be disposed of as close to its source as possible. This reduces time, energy, potential of accidents and the expense of long distance transport, all of which may eventually outweigh the benefits of options such as recycling or composting. The Proximity Principle also alerts waste producers and the general public to factors concerning quantity and disposal, which in turn encourages waste reduction. This principle can be used in conjunction with the waste hierarchy to achieve the best practical sustainable option.

- **Are there economic impacts for a sustainable city in dictating higher environmental standards and waste treatment?**

The challenges facing the waste sector mirror the broader challenges of sustainability in society. Though there is a growing recognition of environmental problems, limited public understanding of the depth of transformation needed to head towards sustainability, and limited willingness or ability to take action in a society still dominated by short-term consumer and lifestyle attitudes, remain. Politicians now use the language of sustainable development very well, but rarely implement policies that would have a significant impact on sustainability. An environmental management approach characterises the way sustainable development is tackled by most politicians and policy maker - due to the public's ambivalent approach to sustainability. People are concerned about the environment in some abstract way, and are prepared to 'do their bit' for the environment, provided it does not affect their pocket or their perceived 'quality of life'.

The waste industry encounters the same dilemma facing politicians and policy makers. They see the contradiction between the public's stated wishes and the public's behaviour, and this, together with the reluctance of much of the waste industry to invest in materials collection and processing infrastructure, results in an inertia that has characterised the traditional Australian waste management industry. The historic availability of cheap landfill void space and government reluctance to legislate in favour of waste reduction may have made the status quo an easier option to manage.

At present, many waste management stakeholders feel certain elements are outside of their control, or outside the influence of the waste industry. These are:

- The need to develop stable markets for recyclable materials and recycled products.
- The need to improve packaging design to aid environmental protection, disassembly and recycling.
- The requirement for waste minimisation to be taken seriously as a waste management option by all waste management stakeholders and other sectors.

Waste minimisation is often a neglected goal, and tends to inspire little enthusiasm when compared to the practical steps that can be taken to recycle or reuse. Nevertheless, business is beginning to take waste minimisation seriously. They realise that good waste prevention saves them money and makes them more competitive.

- **What is the role of industry in ensuring sustainable cities, and what incentives or standards are appropriate to achieve this?**

The way in which the waste industry is controlled through contracts and legislation is vital. If inflexible long-term contracts for waste disposal continue to be the norm, waste minimisation will never be encouraged. The waste industry, however, needs help and support from other sectors of industry to promote the concept of waste minimisation. When moving away from traditional collection and disposal of refuse and embracing a more complex set of waste collection operations and resource management issues, the waste industry needs to invest in a number of areas. These include employment and training, new centres of expertise in material sorting, source separation, composting, market development for recyclables, education and communication with the public. Such developments will also require a distinct cultural change in waste management.

- **How can industry be encouraged to be more socially and environmentally responsible, and to work in partnerships with local communities?**

As described previously, this should be investigated through stakeholder dialogue which can facilitate behaviour and/or attitudinal change in a holistic manner rather than a single solution.

Other Questions that should be raised include:

- **Local waste management: alternative models.**

The Danish model, whereby waste management options are subject to a differentiated tax according to their environmental impact, has been very successful in diverting waste to their government's preferred management techniques. Landfill attracts the highest rate of tax (with many types of wastes banned from landfill). Incinerators attract a lower rate, and recycling and composting are zero-rated. In the past, incinerators that generated both heat and power attracted a lower rate than ones that generated heat alone, which in turn were subject to less tax than incinerators, which recovered no value from the waste at all. All municipal waste incinerators in Denmark are now required to provide both heat and power.

Other waste management options that are gaining popularity or investigation include:

Energy from Waste

Energy-from-Waste treatment processes use the energy held in waste to generate power and heat, while reducing both the volume and the weight of the waste.

Incineration with Energy Recovery

The heat produced from burning waste is transferred to water boilers to produce steam that in turn drives generators to produce electricity. Combined Heat and Power (CHP) plants have been shown to increase efficiency from approximately 20% to 60%. These plants are popular in the UK & mainland Europe as the CHP plants not only produce electricity from the generators, but the steam can also be used to heat local buildings by installing a network of pipes.

Fluidised Bed Technology

Fluidised bed technology is another new system that operates by feeding waste onto a bed of 'fluidised' sand particles, where combustion is thermally more efficient than incineration and the production of pollutants is lower.

Anaerobic Digestion

Anaerobic digestion is a well-established technique for the treatment of wastes such as sewage sludge, slurries and other wet organic wastes. The process is similar to the anaerobic (free of oxygen) breakdown of biodegradable material in landfill sites. However, the process takes place under controlled conditions so that the biogas produced is captured and the breakdown of matter is rapid. The process can achieve an 80% reduction in weight.

Landfill Gas

Biogas, a mixture of methane and carbon dioxide in roughly equal proportions, is generated in the anaerobic conditions of the landfill site when bacteria break down

organic material. The biogas is then piped through the site and the methane recovered can be used to generate electricity. Some sites have the potential to produce useful amounts of biogas for many years.

New and Emerging Energy Recovery Technologies

New and innovative recovery options are being developed to meet the future challenges of recovering value from the waste stream. Although these new techniques do not have a major role as yet, many could become important solutions for treating waste.

Fermentation. The process is the same as that used in brewing beer or wine, using anaerobic organisms to break down the waste into a stable solid ready for disposal and a liquid fuel. This option is mainly used for agricultural waste but could be extended to municipal solid waste.

Feedstock recycling. This involves breaking down plastic by using a chemical process called polymer cracking. The resulting product can be used to manufacture new bulk plastics. It can only be used for the plastic waste stream and should be located near to existing petrochemical facilities, due to the environmental impacts relating to transport. This could be a future means of fulfilling the requirement for a significant increase in the recovery of plastics.

Feedstock substitution. As potential application for mixed plastic waste, this process uses the mixed plastic as a substitute for coal or natural gas in the iron and steel-making process. The process has been used in Germany since 1996.

Plasma Arc. Municipal solid waste is heated to very high temperatures of between 3,000-10,000°C. This is achieved by using a plasma arc, where energy is released by an electrical discharge in an inert atmosphere. This converts the organic waste into a hydrogen-rich gas and the non-organic waste into an inert glassy residue.

3.5 Develop sustainable transport networks, nodal complementarities and logistics.

We would define the above as providing a transport system that moves people and goods between activity centres efficiently (in terms of time and costs), with the least effort and impact. This implies that better transport is measured in shorter or fewer trips, lower energy consumption and so on.

An underlying theme is the better integration of land use and transport systems to achieve the desired outcomes of sustainability.

The ultimate in nodal complementarity, if we are interpreting this correctly, would be a fully self-contained node, where all activity and services are available, and origins/destinations coincide. This node in effect becomes the entire city. Nodes within cities therefore need to complement each other and to achieve that goal, whereas the above suggests containment at the local level.

Questions for Consideration

- **What initiatives can assist in the reduction of automobile dependency?**

Government can play a key role in raising the level of understanding of the transport task in our urban area. There is a need to recognise the diversity in purpose of trips. We need to confirm and continually update why it is people and goods travel, and recognise the transport demands this generates. The transport systems can then better support the needs and demands of the community.

This process can identify target areas of travel where it is possible and beneficial to consider reduction or even elimination of trips and reliance on the automobile through local changes – i.e. proximity to schools and the safety of the pedestrian network to access the schools.

However, this process needs to recognise the realities of how people exist – the concept of people only living, working and playing in their local community is flawed and should not be held as the only answer. It can however target areas of consistent and repetitive travel that could be considered by modes other than the automobile.

This assessment needs to recognise the benefit of social diversity in the activities within a community along with the levels of accessibility and mobility that this entails.

The significant issue is how to compete with the private car. Government has many mechanisms available through policy shaping, regulation and so on to aid in achieving shifts in travel behaviour across the community (e.g. access restrictions, pricing, tolls, parking charges, land use restrictions).

While growth continues in levels of car ownership, should we be considering some form of sliding scale of costs that influences people to consider the alternatives? Can we afford to allow car ownership and hence car travel to continue to grow almost exponentially?

- **Should new transport technologies, such as electric cars and buses, be promoted as alternative to conventional fuels?**

We should all strive for new and improved forms of transport that improve access and mobility while meeting the community's goals and objectives. Yet new transport should reflect a total approach to sustainability rather than just the immediate green aspect. For example, the impact of generating the electricity to power the vehicle and the embedded cost (lost energy) used to transport the energy to the vehicle need to be considered - not just the local emissions.

Government has the capacity to reward innovation by providing incentives to those who introduce or use new technologies, particularly where there is a high capital investment up front for longer term gains.

This raise the question of what are the comparative costs of "green" transport and the willingness of the community to pay (such as using green energy sources even though production is more costly)? Would we be prepared to subsidise less profitable but greener transport to influence longer-term sustainability outcomes?

This may not mean alternative modes of transport change the physical infrastructure. The assumption is that an electric car would run on the same road pavement as a conventional fuelled car. In fact there is a case for retaining and generating better use and return from existing infrastructure.

As such the fuel issue becomes in part removed from the expressed purpose of this discussion paper. If the physical infrastructure and the functionality remain, the type of fuel should become the focus of a different investigation.

- **What are the features needed in new settlement areas to encourage more diverse and sustainable transport networks?**

The important feature for efficient transport systems is the integration of land use and transport, in terms of Functionality, Convenience, Cost and Reliability. This relates to this section's first question dealing with elements that reduce trips.

Diversity suggests choice in the alternatives to travel we have available. The success of a diverse system will depend on its ability to serve a catchment and meet the travel demands in a way that competes favourably with the alternatives. To compete with the car, alternatives require flexibility in time and route choice, comfort and reliability, and the ability to tailor services to the needs of the individual (either directly or by grouping them into like tasks). The concept of Personal Public Transport would fit the profile required in terms of performance and service levels.

Local networks that promote walking and cycling (the "soft" alternatives) with a degree of safety, security and comfort as a commuting, as well as recreational, system have the potential to compete at the local scale. Mechanisms for measuring the "soft" alternatives to justify investment could be developed around more than just traditional transport values of efficiency (cost/time) and safety, to include other indirect benefits in areas such as health, neighbourhood safety and security and so on. This would be a positive input to the social fabric of the community.

The community (and its government channels) needs to identify the benchmarks and performance levels considered acceptable for the transport network at all levels. We can then consider whether incentives or even penalties, for use of non-sustainable transport when better green alternatives are available, are necessary – thus making the non-sustainable alternative pay the subsidy.

When planning for a low dependence on expensive transport systems, what are the community models? From this discussion there would appear to be a necessary intensification of development in inner areas and at key transport nodes to deliver the kind of sustainability being sought. Is urban development well serviced by alternatives to the private car? If not, should it only proceed with some form of improvements?

Providing transport choice does not have to be expensive. The inquiry should look at ways to fund the less capital expensive and local alternatives first where land use encourages it - i.e. give priority to walking and cycling, positively discriminate against cars in centres.

- **What is the role of federal government in assisting metropolitan areas to restructure transport networks in line with more sustainable settlement patterns?**

Federal Government should determine transport matters of national significance where there is conflict between cities and state or local government. In terms of land transport tasks there is also a key strategic level of national infrastructure. The highest level of the transport system in Australia is its aerial and nautical gateways to the rest of the world. These significantly influence the shape of our urban regions.

The federal government can play a key role in ensuring true evaluation of all transport alternatives for the best sustainable outcome, not just continued investment in one form of infrastructure. This may require government being prescriptive in developing transport systems and influencing travel behaviour. An alternative transport and urban containment policy to achieve the outcomes, with approvals and rules positively discriminating in cases of higher transport sustainability, may be implemented. Development with lower accessibility and mobility indicators could pay more towards sustainable transport, than comparable development with a higher sustainability factor.

- **What are the needs of transport systems to be equitable, accessible and economically viable?**

As outlined above, the key issues are functionality, flexibility, cost and reliability.

There is a need to recognise the diversity of transport demands. No single system will meet everyone's needs. A diverse and layered system will reach more people and businesses and achieve parity in accessibility and mobility across the social spectrum.

This should derive better value (i.e. better service levels) from committed infrastructure and rolling stock to help make them more equitable and economically viable by focusing development around identified transport nodes. Development would then concentrate on intensification in existing corridors. This is not to say that new corridor development is not possible, but needs to recognise the extent of new infrastructure required to support development in the longer term.

This should be reviewed equally in all urban areas, not just in the metropolitan context.

- **Is a more decentralised nodal type of transport network appropriate for commuter and traveller needs?**

Commuters (those who travel to and from work) are one target group of travellers that lend themselves to public transport use. This implies concentration of activity into a node or nodes served by the transport system. The level of interconnectivity can lead to multiple origin and destination nodes, with interchange function and design becoming critical to overall system performance and perceptions of reliability.

There is an opportunity to overlay other travel needs where mass transit becomes an option (e.g. to major sporting or entertainment venues). However it needs to be recognised that not all transport needs will be met in this way. Our reviews show that trips result from more issues than simple commuting.

Whether decentralised nodes are appropriate can be measured to some extent by their influence on the transport task – and as such the inquiry should be looking to understand more about people's travel needs and establish performance criteria, instead of relying on a single option.

- **What are the transport logistic needs of industry and how can these be managed in a sustainable city?**

Again there is a need to understand the true transport task. Supply chains are becoming increasingly global and Australia has a significant imbalance between imports and exports to its cities. Movement issues become crowded with other factors such as land availability (costs etc), just-in-time delivery and so on.

Logistics and Supply Chain Management need to recognise the global trends, which may require a quantum shift in thinking in terms of delivery of transport services within our cities. A classic issue that requires federal government intervention is the development and management of port facilities around Australia – deemed expensive, inefficient and underestimating the potential of land transport infrastructure between Australian cities.

It is at this strategic level that federal government leadership is required. Movement within cities is then more of an issue for the city or state government of the day (or both) within the national framework.

3.6 Incorporate eco-efficiency principles into new buildings and housing.

Questions for Consideration

- **How can green construction and refurbishment techniques be integrated into standard building practices?**

What should be considered is the support needed by sustainable techniques and materials within standard building practices, and to try and set a framework for assessment. This should include the recovery and recycling opportunities of the materials, related back to the potential lifespan of the building. On face value timber framing may be the sustainable solution for housing in the initial construction and lifespan but on the first recycling it may be steel and the fourth recycling, aluminium framing. The government should seek to clarify a methodology of assessment, as well as implementing an education program for the industry and the consumer, and incentives.

The responsibility for and cost of the recycling and disposal of materials needs to be examined. If material manufacturers were required to take back the materials at destruction point it may lead to a concerted effort to develop new and more sustainable manufacturing practice and improved materials' characteristics. If the building owner had increased responsibility then the consumer demand would pressure the supply industry to increase and improve on product development. The current ease of waste disposal does not create such a strong imperative for these events to occur.

An issue with "standard building practices" is that they are generally required to comply with the regulations and standards that have become legislation. As the committee members who establish these standards are typically industry representatives, the ability to create strong changes is hampered by the self-interest of the reference group. The government needs to review how new more sustainable techniques can be achieved and verified, rather than rely on the lowest common denominator for standard building practice (e.g. re-cycled aggregates into concrete restricted by standards yet shown to be possible).

- **How can eco-efficiency innovations be promoted to achieve a market value in both commercial and residential buildings?**

The key need for the government to influence the implementation of improved industry practice is twofold. The first issue is education, both at an industry and general consumer level. The second is a financial structure to make sustainable techniques fit the economic drivers.

At Lend Lease we are constantly striving for a better overall outcome for our projects, clients and the community. Often we find ourselves constrained by one of the key elements to sustainable city development – competitiveness. Whether you have the best practices is irrelevant if you cannot demonstrate them because competitors do not follow the same principles.

The government should examine the buildings and built infrastructure it has direct influence over and measure their contribution to the longevity and development of building practices. The government has a huge influence with landholdings, residential and commercial buildings, and infrastructure provision. If it looks at leasing space, how far is the government willing to compromise its sustainability goals to improve the rental deal?

The government could also require property holders (as well as itself) to implement ASIC reporting requirements for triple bottom-line benefits of green building portfolio (including RISK exposure for climate change and resource pricing).

- **What are the impediments to eco-efficiency principles being taken up across new housing developments and commercial areas?**

There are numerous impediments that discourage improvements in current conditions. Both education and financial incentives would assist in addressing concerns. Within commercial buildings other influences are present. The lease arrangements on a typical commercial building do not reflect any real advantage for better practices to be adopted, as it is typically based on lowest dollar rental deals with separate on cost for building services. This does not adequately account for the best building solution. The assessment criteria for commercial buildings set by the Property Council is also a deterrent – as significant redundancies are needed to meet the upper end of commercial building classification. This is directly at odds with achieving sustainability ratings and the best sustainable outcome. These criteria are used both by corporations and government as part of the selection process for new tenancies. The Government should perhaps be showing a greater level of leadership in the real assessment of buildings to suit their needs.

- **What type of incentives or standards for new developments might be appropriate to encourage more sustainable residential complexes?**

The issue of incentives and encouragement has been covered in a number of our other responses. A key issue here however is the actions that can be taken with the existing building stock to improve its sustainable functionality. Throughout Australia the quantity of new, compared to existing, building works is relatively small. We could see a much greater impact from looking at how the existing areas function, and how incremental improvements can raise the standard of environmental conditions.

- **Are existing building standards and product labelling sufficient to enable informed consumer choices and to ensure that the use of eco-efficiency materials and designs are maximised?**

The role of industry education to achieve better outcomes, and general public education to lift awareness and consumer demand are both very important if we wish to see a real change.

3.7 Develop urban plans that accommodate lifestyle and business opportunities.

The planning and land use choices of our communities is fundamental to sustainability. Like so many countries, Australia's history of land development is a checked one now recognised as unsustainable. Traditional practices have focused on zoning ordinances that segregate employment, shopping, services and living, complemented by low-density growth planning aimed at creating vehicular access to vast land areas. This pattern of development has created inefficient, disorganised, sometimes even random, urban outcomes commonly referred to as sprawl[4].

The physical outcomes of sprawl are all around us: increased traffic congestion and commute times, increased air pollution, inefficient energy consumption, continued loss of open space, and isolated living patterns to name but a few[5].

The development of urban plans that accommodate lifestyle and business opportunities demand a transition from poorly managed sprawl to land use planning practices that create and maintain efficient infrastructure, establish good proximity to places of work and ensure a sense of community[6]. The means to achieve this is via sustainable land use practices.

In order to best respond to the items raised in the discussion paper, the issues have been regrouped and reordered. We believe that this will more clearly explain the Lend Lease position with respect to the development of urban plans in this country.

Questions for Consideration

- **What planning models and zones can we use to accommodate the different lifestyle needs and preferences of Australians in cities?**

The fundamental planning methodology of the sustainable city should encourage greater physical accessibility to jobs and housing for all residents through more compact, mixed-use development patterns that are spatially efficient but friendly to both communities and the environment.

A variety of new planning tools are now well documented, tested and available for translation into the Australian context. The leading schools of thought are outlined below:

Smart Growth. Supportive of growth but seeking to respond to sprawl, Smart Growth questions the economic cost of abandoning infrastructure in a city, only to rebuild elsewhere, often further out. This movement emerges within an altering society, demographic shifts, environmental knowledge and ethics, increased fiscal concerns and iterative approaches to growth[7].

New Urbanism/Neo-traditional Planning. An urban design reform movement to restore urban centres, build cohesive neighbourhoods and districts, conserve natural environments, and preserve the legacy of the built environment[8].

Ecological Landscape Planning. A procedure for studying the biophysical and socio-cultural systems of a place, to reveal where a specific land use may best be practiced[9].

[4] Sprawl is a well defined condition relating to traditional planning practices in the USA. Therefore the term is transferred to the Australian condition. www.sustainable.doc.gov/landuse
[5] Ibid
[6] Ibid
[7] www.sustainable.doc.gov/landuse/lukey
[8] Ibid
[9] Ibid

At Lend Lease we do not believe that one methodology should be endorsed. Rather, we believe a number of models and, indeed, hybrid of models can be accommodated via best-fit practices to particular locations. We seek understanding of the key drivers and various tools of delivery so they may be introduced on a project-by-project basis.

- **What community, commercial and biodiversity needs should be addressed in developing new urban centres?**

Rather than creating a national solution to planning, we seek localised responses to environmental conditions, social changes and economic drivers. To this end we have evolved a series of principles that respond to community, commercial and biodiversity needs as a means of addressing the development of both new and existing urban centres.

The following principles pertain to the delivery of sustainable urban centre design within the Australian condition:

Traffic Network. A detailed review of an existing road network and clarification of the road hierarchy is an essential step in establishing a new or revitalised urban plan. The role of individual roads, their relationship within a regional road network and the effectiveness of internal movement within and through an urban centre needs to be established for effective and efficient vehicular traffic.

Public Transport. A transport system that maintains a balance between public and private transport is essential to the successful revitalisation of an urban centre. This balance must maintain appropriate facilities for private cars including traffic measures and car parking. Within both existing and new centres, an efficient and effective transport system can also become a long-term tool to encourage a modal transport shift.

Car Parking. A strategic car parking policy is essential to the effectiveness of an urban centre. While public transport is to be encouraged, effective car parking issues are key components in the functionality and accessibility of an urban centre. Indeed, well managed and planned parking facilities can further the objectives of a consolidated urban centre, supported by a credible public transport network.

Open Space Network. An open space network with a clear and legible hierarchy is of prime importance to both the functionality of an urban centre and the level and quality of user interaction. The open space network may serve both technical and social responses to sustainability. For example, it may provide the location of a water management system that in turn provides an appropriate landscape for recreation within an urban centre. As such, the enhancement and creation of open space networks will significantly progress the creation of a vibrant, safe and secure environment for community activity.

Public Realm. The public realm should incorporate a mix of public open spaces, including the street network, connectors such as promenades, regional and significant open space, water edges, as well as local and pocket open spaces. Safe and secure pedestrian passage is essential within this network and can be complimented by activities such as street edge retail, restaurants and cafés and recreational spaces.

Land Use. The intention of an urban centre is to be a dynamic, vibrant, safe living and working environment. In order to achieve this, an urban centre must be well planned. Mixed use development, particularly the inclusion of residential, extends the diurnal life of the city. It increases weekend and evening activity, supports street life in the form of cafés and restaurants, encourages diverse cultural activities and entertainment, provides residential diversity within a variety of markets and enables employment choice. While these

uses need not occupy every building, their close proximity creates an urban centre that is mixed-use in its entirety.

The collective response to these principles leads to the development of a master plan for an urban centre.

- **Are urban hubs and communities concentrated around public transport nodes an appropriate future model to suit Australian lifestyle needs?**
- **How do we transform existing suburban and inner city developments into more sustainable forms of community living?**
- **Are there dangers in developing decentralised cities with multiple urban hubs and how do we address these issues?**

Options for sustainable delivery of urban centres include, but are not limited to, transport nodes, adaptive transformations of existing structures and decentralised cities. In order to determine the appropriate approach to urban centres, we prefer a master plan process, a process that may contain many of the attributes of development types'.

Based on our extensive experiences in Master Planning on large-scale developments., we understand the complexities of major urban projects. In order to achieve successful urban plans, we have developed a master planning approach. This approach gives us the ability to assess logically the physical, social and economic drivers to deliver the optimal framework for new and ongoing development. The structure of this process is as follows:

Needs Brief development, including statutory, community and market forces, which also encompasses an assessment criteria for the remainder of the Master Plan process. The Needs Brief will be agreed to by all parties to confirm the direction and detail the project specific processes.

Site Context and Benchmarking including detailed consideration of the planning context, site environment, service and transport infrastructure issues and contextual relationships. A detailed inventory of the existing environmental conditions is developed identifying key constraints and opportunities. In concert with the physical studies is an investigation of both the existing social and economic character of the area, supported by benchmarking and economic hypotheses relating to the predicted land use.

Analysis and Evaluation of the Investigation Material leading to a true capability assessment. This includes overlays and professional assessment of the material compiled during the investigation period. The output of this process is a capability model defining the development capacity and key opportunities.

Planning Principles are established, responding to (if not establishing) the world's best practice in development. This includes sustainable environmental objectives, in-principle patterns of sub-division and transport and movement philosophies.

Concept Structure Planning. options covering Open Space Networks, Road Networks, and Land Use responding to the site capability and planning principles. This is assessed against the performance criteria outlined in the Needs Brief. Each of these components will be further broken down into specific elements such as water management and traffic generation.

Detailed Concept Planning. developing the preferred solution(s) to easily understood and communicable format. Graphic representations of the plan are developed, with key details enlarged and articulated. This provides key material for presentation and discussion of the options and opportunities.

Public Exhibition and Consultation. of the preferred Structure plan outcomes to confirm and publicly accept the assessments and civic goals. This will encompass the required stakeholder groups to allow the project goals to be achieved.

Plan of Management to support the Vision and Structure embodied in the plan. This will be the formal controls governing the physical and economic development and ensuring that the work that has been undertaken is upheld and implemented throughout the extended life of the project.

Master Planning Reporting/Approvals process to record, confirm and publicly accept the outcomes of the process. This will present the investigation, analysis and outcomes of the Master Planning process in a form suitable to achieve the required approvals.

The structure to undertake this process as outlined above requires a team of specialists with core skills focused around the delivery of conceptual, intellectual data and analysis. From our experience we have discovered that such Master Plan processes lead to the reinforcement of existing transit networks or provide a platform for discussion in the appropriate shifting of existing transit conditions. Transport nodes are already a part of Australian culture, and future and adaptive development must seek to consolidate and strengthen this infrastructure.

Further, as land owners of significant parcels in town centre areas, we are driven to retain assets and consolidate with new/additional uses rather than abandonment for new sites. This attitude is implicitly connected to our community responsibility. As members of communities, rather than merely infrastructure providers, we are enabled by the master plan process to grow and change according to the evolving social, environmental and economic needs of the communities in which we reside.

- **How do we ensure that further urban expansion occurs as planned community developments?**

Surety that future urban expansion occurs as planned community developments is the responsibility of governance and the commitment of infrastructure providers. Land use decisions are predominantly a local government responsibility. However, it is paramount that the states play an important role in fostering smart, long-term decisions. One of the greatest challenges of sustainable growth is recognising the interconnection of all state and local land use decisions. State and Federal governance has the ability to encourage or facilitate increased communication and cooperation between departments and local governments, and local communities.

Essential to ensuring the development of planned communities is the adaptation of appropriate or “right” philosophies. The greatest difficulty to achieving planned development is the economy of scale. Where large developments are generally more easily controlled in terms of progression, the long-term vision of small projects can be more difficult to determine unless they belong to a greater vision plan. It is the responsibility of authorities to ensure that the best long-term outcome is achieved despite substantial small-scale development in the market.

Private bodies – local companies, banks, urban services companies – have become players that cannot be ignored in local urban politics. For our part as an infrastructure provider, the key lies in being a good corporate citizen: encouraging private investors to belong to communities rather than merely infrastructure providers, encouraging lasting private

investment. Many corporations already understand the benefits of long-term relationships with communities and local agencies but for others, lessons need to be learnt.

The ability to partner with private players in order to achieve long-term visions is key. In the current context this leads to untraditional partnerships, including public, public private, private public, citizen relationships to name a few. As we have discussed earlier, the opportunity to seek citizen participation and education in the development of communities leads to very positive outcomes in terms of social, economic and environmental sustainability.

Other Topics

3.8 Social Infrastructure

As stated in our introduction to this paper, it is our belief that liveability and good governance are key components of sustainability. The social infrastructure that supports these goals is therefore important to consider when looking at the future of city development.

Often we have found that the assumption when looking at social infrastructure is that it means providing sports fields and isolated community centres. When looking at completed projects the reality is that both are rarely used and do not have a real relevance to most of the community. We have found that the assumptions are that only inner urban residents are interested in cultural events, and those in the outer areas only want rugby fields and cricket pitches. Our studies and market research is demonstrating that the greatest need and desire across suburban areas is for facilities that can accommodate cultural events.

The association of facilities with relevant populations is also important. This relates to declining household density, and the ageing of populations in some areas. The historical trend has been for younger families with children of school-age will locate at the edge of the urban area, driven in part by proximity to broader open spaces, but very much by the cost of the housing. The inquiry should look at how diverse social groups can be encouraged (and can afford) to live in areas to maintain both community diversity and the use of established facilities.

Perhaps the most important factor lacking in the provision of social infrastructure within (particularly new) development, is the program element. Too often facilities are provided because they conform to the local infrastructure provision requirements but are not used due to lack of community interest. The inquiry should consider the impact of programs as a contribution to the community by developers, rather than just hard facilities. The ability to influence the use and relevance of facilities can also be dramatically improved by co-location, and consolidation of the management and programmed events.

3.9 Density – Household and Population Thresholds

It has been shown that household populations have been declining globally. This means that despite having “higher density housing” the amount of people in an area may be the same or lower than in the past. We are working on around a 30% reduction in resident occupancy from initial purchase to second generation, for new developments.

This obviously impacts the efficiency of the built fabric, as it is possible for the amount of construction per person to be considerably higher than what has been historically the case. Of course controlling the way people use their dwelling is very difficult.

Perhaps a bigger issue for sustainability is the facilities and services that are provided, and their reduction in effective efficiency over time. In some cases this may mean that facilities such as schools become unviable. The outcome is loosing the facility to the social fabric of the area, the waste of the embedded energy and materials in the building, and the need to use energy and resources to transport the children who are still in the area.

To keep pace with the reality of changing density, strategies should be put in place for appropriate revitalisation strategies to maintain population levels.

3.10 Natural Disaster Management

In an age where people are increasingly living in conflict with the environment, the sustainable aim of natural disaster management must be to create cities, towns and communities with reduced vulnerability to dramatic change or extreme events. In order to be sustainable we must be able to adapt and respond creatively to economic, social and environmental change[10].

Natural disaster management is two-fold. In the first and most dramatic instance, response and recovery solutions to extreme events need to be immediate. In the second instance, and coupled with growing knowledge of the natural systems in which we live, we seek disaster mitigation both in terms of adaptation of existing at risk communities as well as the design of new communities.

In Australia communities located in high-risk regions, by definition, are not sustainable. Residents in regions prone to fire, drought, flood, cyclones and the like cannot count on the longevity of their community.

Moreover, as Australians we have to come to terms with the fact that what we hold culturally dear, the bushland, oceans and wide-open spaces, are the very environments with which we are in conflict. As such, it is important that social sustainability is supported within the measures to improve community loss.

Sustainable development holds the key to mitigating or removing the loss of these communities. Relocation is the most extreme and often unviable response to disaster prone regions. Rather, methods that reduce disaster threat, such as restricting construction in particularly vulnerable areas or improving hazard-resistance of structures, can be introduced in established communities. The ideal outcome is designing resilience into new communities through careful planning that avoid or enhance environmental systems[11].

In a broader context, sustainable design seeks to achieve resource efficiency in energy, water and materials. This in turn has a direct impact on disaster mitigation. Current evidence shows that energy consumption, and particularly fossil fuel combustion, is a major factor in global climate change. This change is now being identified as a contributing factor in the increase of extreme weather. It thereby follows that communities employing sustainable practices may well temper the very environment that threatens them[12].

In the immediate aftermath of a disaster, sustainable technologies (primarily renewable energy systems) also provide excellent short-term replacement to lost infrastructure and therefore should be fostered as part of disaster response[13].

[10] Natural Disaster Management is becoming more significant with global change in weather patterns. Governments are now discussing with respect to smart growth. “Disaster Planning”, www.sustainable.doc.gov/disaster

[11] UNESCO has begun to discuss “resilience” with regard to sustainability and disaster prone areas. “Resillient Communities” www.unesco.org

[12] “Key Disaster Planning Principles”, www.sustainable.doc.gov/disaster

[13] Ibid

For consideration:

- Establish commitments from participating local authorities and utilities as well as institutions, private companies and government departments to apply resilience assessment criteria to their project cycles.

- Establish a mechanism with the insurance industry to understand more accurately vulnerability mitigation measures in client risk evaluation.

- Identify major vulnerability locations and seek mitigation practices.

- Introduce policy and practice changes at the national, regional and even international levels. Natural disasters do not adhere to political boundaries[14].

[14] "Resillient Communities", www.unesco.org

4. Credits - Professional Contributors

To respond to the discussion paper Lend Lease has drawn upon a number of our in-house experts who possess both the academic grounding and real practical experience in undertaking major urban projects. The professional contributors to the response are:

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