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Sustainable Place Making: Australian Exemplars

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Objectives

This paper provides the background to the case studies that will be presented at the conference. It is aimed at providing a concise view of what constitutes a sustainable place and the important subtleties in achieving an active, walkable and safe environment that is diverse, humane and attractive to people.

Context

In Australia, where the population is expected to increase 60% by 2050 (Australian Bureau of Statistics, 2008), to be accommodated predominately in a few coastal urban areas, there is considerable pressure on the natural and cultural landscape. However, this growth provides an opportunity to create a sustainable development form. Equally, if the status quo is maintained, it could result in major detrimental impacts to society and put people under considerable stress.

Sustainability that embodies a civilized and engaging future, is of particular importance in a country where there is only a relatively short history. While there are clear distinctions between new places, such as in Australia and historic centers, the essential ingredients for successful urban environments are similar.

Despite climate change being a scientific reality, some of the predictions are imprecise (Sackett, 2010). However the production of greenhouse gases is only one component of sustainable places.

Australia is experiencing dramatic social change due to demographic and political influences and increasing urbanization. However, while general trends are emerging, defining Australian society is elusive as, like most places, it is not homogenous but a mix of different cultures and ideals (Mackay, 2007).

The need to create distinctive places within the context of increasing globalization has led to a realization that regional identity, created by the natural and cultural landscape, coupled with locational and climatic differences, is important to place making.

Sustainable Development Ideals

There are numerous publications about urban development; well considered views that define the problem and focus on the political agenda required to achieve a sustainable outcome (McManus, 2005). Others emphasize winning back cities for pedestrians and other users (Gehl et al., 2006). However, many of these studies tend to be Eurocentric and suited to heavily populated existing cities and are focused on

the qualities of the open space, rather than the context. Others define a clear vision but often have a particular bias, such as an emphasizing built form. The numerous talented designers involved in the delivery of our cities have valuable contributions to making places distinctive but often suffer from design briefs that focus on particular outcomes for buildings possibly to advantage a particular owner or a concern for a commercially safe solution.

Yet, for all this debate and skill, that is no doubt having a propitious impact upon urban development, there is still often an inability to create places that can evolve over time into environmentally, socially and economically sustainable places.

At the extreme end of the continuum, sustainable cities are expected to achieve zero emissions and while this is achievable, it suggests green-field development schemes that can manage all inputs, including energy requirements, means of energy generation and the management of waste, including recycling. However even this ideal may not lead to a socially and economically sustainable environment.

Lord Rogers suggests "The result should be …. a dense and many centred city, a city of overlapping activity, an ecological city in which art, architecture and landscape can move and satisfy the human spirit." (Rogers, 1997).

At a more prosaic level but equally important, many are concerned about the basics that often seem to be lost through the design process. Bill Bryson's lament provides a   more common view "everyone ... responsible for urban life seems to have lost sight of what cities are for. They are for people. This seems obvious enough, but for half a century we have been building cities that are almost for anything else: for cars, for businesses, for developers, for people with money and bold visions who refuse to see cities from ground level, as places in which people must live and function and get around…. Why should cars be given priority over me? It is the curse of our century - too much money, too little sense" (Bryson, 1998).

Alain de Botton (2006) eloquently echoes this by suggesting that happiness is dependent upon our experience of places and not to a grand concept or the imposition of a particular doctrine.

There is no conflict, it is simply that the problem is multidimensional, requiring a clear understanding that all the components should be directed towards **creating a place**, treating as secondary the diverse design briefs relating to buildings and various interest groups. However commercial imperatives can be accommodated and still create places that "inspire change … for an equitable, humane and engaging future" (Maher, 2009) but it requires careful planning cognizant of the implications of broad concepts at the neighborhood level. It also requires a better understanding of what makes a place sustainable.

Sustainability embraces a broad spectrum

Over 70% of the people living today will be alive in 2050 and hence climate change has broad implications for us all (Flannery, 2005) and the scale of the problem requires action at several levels. **However, there is a clear distinction between global sustainability and urban sustainability. Therefore it is important to determine what can be influenced at a local level and what requires policy or regional control.**

Air quality has global implications. Greenhouse gas impacts contrasting with ozone depletion, involve different processes and pollutants but both have potential significant implications for the future quality of life. Clearly, public policy and regional planning affect the broad issues pertaining to air quality and climate change by influencing energy production and use, transport, industrial processes and associated pollutants.

Local actions can influence biodiversity which is an essential part of our future wellbeing (Environment Australia, 2001). Notwithstanding the obvious site specific actions that can protect valuable wetlands and habitats, regional planning policies are important to create the context for meaningful protection of habitat and biodiversity by creating valuable green corridors and linkages.

Energy generation and consumption is the main contributor to greenhouse gas emissions (i.e. nearly 60% in Australia) but is primarily controlled at a national or regional level. Urban development, however, provides opportunities for reducing power losses through local generation and for reducing power demand through planning and building design.

In Australia, securing adequate potable water to support our growing population is vital. This can be handled at a policy level, via the adoption of adequate resource management, water supply strategies, recycling and demand control using pricing mechanisms and education. Site specific techniques, coined water sensitive urban design, can be used to capture, feature and reuse water (Land Systems EBC, 1993), as well as minimizing demand with water conserving fixtures.

Waste management has become the means to dispose of the rampant consumerism of modern society and, while attitudes are changing, there needs to be a shift in attitude and technologies to achieve sustainable practices. Urban development can influence waste generation to a degree through construction standards and through the design of buildings to enable recycling.

In summary, the above issues: air quality, energy generation and energy use, biodiversity, water and waste management; are extremely important for our future but tend to be issues primarily dealt with at a policy or regional level, albeit that site specific actions can, and do, have an influence.

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Influences on City Form

The essential ingredients that affect the sustainability of urban areas, namely the mix of uses, transport and density, are often passionately debated. For many, there seems to be a disconnection between their changing life cycle needs and protecting the status quo. The debate in Australia has been ongoing in the media and within the property industry, with extreme characteristics for changes in density being promoted. Notwithstanding this negative campaign, many recognise that increased densities can have many benefits including: housing diversity to suit changing lifestyles and demographics; improved public transport; improved and affordable public open space; and a diversity of accessible community services. However, "only if urbanism is practical, walkable and convivial will density be tolerated" (Duany et al, 2010).

Transportation has a dramatic affect on urban form and the well-being of, and cost to, society. Travel times determine where people live and cars have made it possible for people to be widely dispersed from our urban centers, upon which most people are dependent. However, fringe areas are generally characterised by low densities and a lack of community facilities, retail uses and employment opportunities.

Vehicles are becoming increasingly expensive to operate due to fuel and storage costs, as well as requiring ever increasing infrastructure costs to accommodate them. The rate of car use is outstripping any gains in fuel efficiency (Newman et al., 2009).

The direct costs are obvious, but have not been quantified until recent years and still are not firmly embedded in our psyches, due to self interest and the powerful lobby groups involved in numerous industries with vested interests.

A major cost, less understood, is the affect on health and the associated costs to society that manifests itself in disease and loss of productivity. There is considerable evidence to indicate that fringe suburbs accommodate less active people, as they have fewer opportunities for incidental exercise, than inner urban dwellers. This results in a higher incidence of obesity and related diseases. Indeed the direct cost in Australia of this inactivity is estimated to be $1.5 billion per annum and increasing (Econtech, 2007).

Transportation contributes to greenhouse gas emissions (i.e. 14% in Australia) and has far reaching implications in creating sustainable places.

The more people who live and work in an area, the more viable public transport becomes. A density of 35 dwellings **and** jobs/hectare is the minimum necessary to support public transport (Newman, 2007) but 40 to 80 dwellings/ha (Department of Infrastructure and Planning, 2009) is a preferable level for a frequent and hence attractive public transport network. These densities are readily achievable, using a mix of building typologies, that rely on low density, affordable construction

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techniques on individual allotments, combined with some medium and higher density development, rather than Le Corbusier's dehumanizing vision of a city.

The cost of all forms of transport for inner city suburbs is half, and when taking walking and cycling trips into account, a quarter that of fringe suburbs and this directly equates to greenhouse gas production and health (Trubka et al). There are strategies for providing public transport to suburban areas (Mees, 2010). For example, as modal demand changes, roads can be utilized for buses and cyclists in exclusive lanes. Notwithstanding, dispersed areas are difficult to service with frequent and conveniently located transport facilities. A transport network connecting dense nodes or corridors is more logical for sustainable urban areas.

Similarly the cost of infrastructure is significantly more for the outer suburbs. In Perth for example, the infrastructure costs for inner areas are approximately a third the cost of the fringe area. Very similar cost differentials have been established in several studies in various locations and it is instructive to have a sense of the relative numbers. For a 1000 dwellings on the fringe compared with urban infill, there is a cost penalty, in 2007 costs, of A\$85m for infrastructure works (excluding municipality charges) and annual costs for transport of A\$18m, with health and associated productivity costs of A\$1.5m per year, plus the operational costs of the infrastructure (Trubka et al). Over the life of a suburb and on a citywide basis these costs are unsustainable, as is the form of low density development that has been the preferred approach in many places in the misleading guise of affordability.

The principles of sustainable urban development have been established for over 40 years but have been forgotten by many. Diversity of land use was a basic tenant of Lynch (1971) and Jacobs (1961), albeit for different reasons. Mixed use, along with adequate density, has become the accepted practice for enduring and viable places. This does not mean that the increasing worldwide urbanization needs to be accommodated within existing urban areas. It does mean however, that urban infill should take precedence, while green-field development, when necessary, needs to provide for transport needs, mixed-use and employment opportunities to create sustainable places, not just dormitory suburbs.

The way our cities work is equally dependent on the social fabric and how distinctive communities can be established (Mackay, 1999). There has been considerable change in the demographic makeup of Australia, particularly in the 1990s (Salt, 2007), that affects the way we interact, viable forms of development and community expectations. Australia is becoming more urban with 90% living within an hour of the coast and 80% living in suburban/urban areas and there has been a dramatic shift in the composition of households (Standing Committee on Environment and Heritage, 2005). Couples with children composed 41% of the population in 1991, 33% in 2001 and are predicted to be 28% in 2011, while couples without children will rise from 24% to 28% over the same period (ABS, 2008). This means that by 2011, 44% of the population will be single or live in non-traditional households and this affects housing needs, consumer patterns, social behavior, and

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logically it should influence urban form. The long term trend to fewer people per household is substantiated by a 1.2% population increase between 2001 and 2005 and an increase in dwellings of 1.5%. There is also a strong link between place, social makeup and economic performance (Florida, 2005 and Hassell, 2009).

Legibility is important in providing a sense of cohesiveness, and in conjunction with connectivity assisting in way-finding and creating identity (Lynch, 1971). Robustness to accommodate change, the potential for personalization of a place, together with visual diversity, build in the design subtleties (Bentley et al, 1985).

Land use mix and the way building use contributes to activate streets are crucial. English Partnerships promote a specific number of entrances per linear frontage to achieve active streets (Llewelyn-Davies, 2000). Notwithstanding the desirability of the outcome driven by this formula, it is specific to the English context and there are exemplars in cities such as Portland and Vancouver that follow the principle but reflect a different land-use typology and create a different street rhythm.

For successful centers, a well connected and legible main street is important and requires 15,000 to 20,000 vehicles/day to create sufficient activity to be attractive and maintain viable retail uses (Cullen, 2010). Indeed in several communities, retailers have successfully lobbied to have malls reopened to vehicles to ensure passing trade and an awareness of the place. In Australia, public pedestrian-only environments have been problematic and even in major European cities with intensive residential uses, street activators and millions of tourists, pedestrian places can be unsafe at times and difficult to manage. They are certainly not a panacea for the creation of equitable urban spaces. Therefore streets should be for all users, and public open space and parks need to be overlooked by adjacent buildings.

In most western societies, we have inherited the right to sunlight mantra from the U.K. This had its origins in trying to improve the standards for tenement housing and has found its way into planning requirements regardless of the prevailing conditions. Research carried out in Singapore (Bay and Ong, 2006) suggests that for tropical, and possibly subtropical, areas the orientation of streets and overshadowing by buildings provides a significant improvement in the microclimate.

There are some great cities that we all admire, that seem to follow no rules but often time has resolved major problems and demand has resulted in the use of even the most difficult sites. Most cities relate back to ancient Rome, which was planned on a relatively simple grid, albeit interrupted by natural features and some dramatic diagonal roads that symbolically create major axes connecting important cultural icons. New urban development does not have the luxury of time, however, and needs to provide commercially achievable solutions to ensure they can be realized. This pragmatic approach should still enable subtleties to be introduced into plans to create that often intangible dimension that makes places desirable and distinctive.

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Towards a Sustainable Urban form

The ingredients referred to in other sections of this paper are important in establishing sustainable places. This section deals primarily with the overall form of our cities to create multiple nodes of activity around transport infrastructure.

There needs to be a shift from low density suburbs to more intensive development along transport corridors and dispersed employment to provide improvements in lifestyle. Brisbane City Council (BCC) has made, and is making, changes to the planning scheme by increasing densities around regional centers and along transport corridors in response to this need but at the same time is tearing the city apart with inequitable road infrastructure. State Government and the BCC are also collaborating on the Inner City Rail Capacity Study, in which HASSELL is involved, that will lead to an underground rail system, integrated with other transport modes, including bicycle 'freeways'. This project has the potential, in conjunction with land use changes, to significantly improve the amenity and sustainability of the inner urban area.

Additionally, there needs to be a regeneration and adaptability strategy to achieve increased net densities in all suburbs to provide diverse mixed-use centers and adequate public transport.

This development formula is being adopted in many places, including South East Queensland, but is still under constant debate. Therefore **it is important to broadly acknowledge that a city built around centers and transport is vital for our future and that this approach must include adaptation of the existing low density suburbs.**

Urban Sustainability

The above ingredients form the basis of sustainability but it is the subtle interaction of urban design and land use patterns working within the realities of modern building typologies that creates a successful place, socially, economically and environmentally.

In our experience, it is important to create communities rather than just provide housing, and the success of a place is very dependent on the interface between buildings and public places, streets shared by all users and adequate density within a simple legible framework that accommodates a variety of uses.

To provide a palette to create legible active centers is fraught with dangers due to the wonderful exceptions. Notwithstanding, we believe the following is required to create a sustainable framework for urban development.

1. A regional plan that clearly defines the vision and the extent of development.
2. Working with the land to protect the environment and capitalize on the location.

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3. An absolute commitment to sufficient density and mixed-use development.
4. An understanding of the social context, trends and related requirements.
5. An appreciation of the market drivers to achieve desirable land use outcomes.
6. A centers policy that delivers a mix of employment, retail, education, leisure, recreation, community and residential uses, well served by public transport.
7. Regular shaped blocks to readily accommodate the range of intended uses.
8. Climate responsive site and building development that is overtly expressed.
9. Building uses that overlook public spaces and streets.
10. Buildings that help create legibility through varying scale and form on key sites.
11. Buildings with zero setbacks, depending on land use. For example, residential buildings are an exception and need a 3 to 5 meter setback to provide outdoor space and privacy, with each dwelling at ground level having direct street access.
12. Land uses that provide a street rhythm and activity by delivering people to the footpaths at frequent intervals.
13. An appreciation that streets are important urban places that need to accommodate all users and should create a pleasant and convenient journey to public transport.
14. Streets that respond to the environment to mitigate the climate.
15. A simple legible network of two way streets, with a main street accommodating 10,000 to 20,000 vehicles/day.
16. A commitment to high quality streets with strong thematic planting.
17. Public open space located to maintain the concentration of activity within town centers, and parks located to create well observed recreation space and community identity through a rich and distinctive landscape development.
18. Simple design guidelines and the continual vigilance via a formal review process.

Australian Exemplars

South East Queensland New Town is a new town for 100,000 people on a green-field site in one of the most rapidly developing regions in Australia. It is significant for the open space and water management strategies, the environmental agenda, transport and social strategy. Creating a regional gateway, this strategy for a new town responds to the terrain and natural conditions, uses water management and open space to define each community, has a strong public transport focus and walkable neighborhoods, provides diverse housing and community facilities to address the changing demographics of the region and relies on mixed use to create diversity and local employment.

The scale of the project and the attention to place making and employment will be beneficial to the region, which currently tends to comprise dislocated land uses and to rely on the State capital, over an hour south, for employment. Therefore the profile of people is expected to be quite different from the relatively homogenous population of other green-field sites.

Of major significance is the protection of regionally significant wetlands by the retention of storm water on site and the reuse of waste water in the development, the

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energy and waste management systems, the transportation network and, by creating employment, the potential to provide greater containment and hence less travel.

Kelvin Grove Urban Village is an inner city urban village on a 17 Ha brown-field site. It was planned in 2000 and established an exemplar for mixed use urban infill projects in Australia, winning 11 major planning and design awards, four for sustainability and the environmental outcomes. It comprises a mix of residential, including affordable accommodation, retail, community, recreation and educational uses to provide a rich mix of wide appeal.

The project has a small environmental footprint as it capitalizes on the existing social and physical infrastructure, is well served by public transport and established site and building sustainability standards, many of which are now common place.

The Urban Village is based on a permeable, connected and highly legible grid with a main street focus and active, overlooked public places to provide a walkable and readily accessible town with complementary uses and a strong sense of identity.

The Gold Coast Health and Knowledge Precinct is a project that will incorporate a university and two hospitals with supporting research, commercial, retail and residential uses to create a knowledge-based, smart community.

Building on major government investment and using our experience from Kelvin Grove, the plan has been prepared to create a distinctive town centre with a dense mix of complementary uses that will evolve in response to demand. Its primary purpose is to attract and help retain knowledge workers through the creation of a vibrant place, incorporating the key ingredients they appreciate in urban areas (Mackay, 1999 and Florida, 2003 and 2005). This medium density development will be an important project in establishing a new form of transit oriented development in this part of South East Queensland.

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