Embodying the past in the future?
Sustainability and built heritage in Fremantle

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Abstract
Is the desire for a more sustainable urban built form compatible with the protection of built heritage or is there instead an intrinsic conflict between the two? This paper draws on Australian and international research to argue that while there are tensions between sustainability and heritage objectives, it is the connections and compatibility between the two that are more significant. The paper argues that historic buildings and urban forms are often more sustainable than many modern alternatives and that Fremantle, Western Australia is an illustrative example of this.

There remains, nevertheless, scope for greater convergence between heritage and sustainability goals. This will require a fuller concept of heritage (one that goes beyond the narrow focus on particular buildings and periods in history and instead becomes one that deepens our ‘sense of place’), as well as an expanded concept of sustainability that goes beyond just environmental protection to give greater emphasis to the social, cultural and economic aspects of sustainability. When understood in this deeper way it can be seen that sustainability and heritage are allies in the protection and creation of meaningful and sustainable places.

Introduction
Fremantle can lay claim to having some of the most significant built heritage in Australia. It remains a relatively intact 19th century port city and it stands out from the ‘steel and glass’ skyscrapers and suburban sprawl that sadly define most of Perth and its suburbs. Its rich built heritage makes Fremantle one of Australia’s most popular tourist destinations and this built heritage is greatly valued and fiercely protected by many of its 25,000 residents. Fremantle has a reputation as being community minded, progressive and ‘green’. The inner City of Fremantle votes Green at several times the national average. Fremantle has a reputation as being community minded, progressive and ‘green’. The inner City of Fremantle votes Green at several times the national average. Fremantle has a reputation as being community minded, progressive and ‘green’. The inner City of Fremantle votes Green at several times the national average. Fremantle has a reputation as being community minded, progressive and ‘green’. The inner City of Fremantle votes Green at several times the national average. Fremantle has a reputation as being community minded, progressive and ‘green’. The inner City of Fremantle votes Green at several times the national average. Fremantle has a reputation as being community minded, progressive and ‘green’. The inner City of Fremantle votes Green at several times the national average. Fremantle has a reputation as being community minded, progressive and ‘green’. The inner City of Fremantle votes Green at several times the national average. Fremantle has a reputation as being community minded, progressive and ‘green’. The inner City of Fremantle votes Green at several times the national average. Fremantle has a reputation as being community minded, progressive and ‘green’. The inner City of Fremantle votes Green at several times the national average. Fremantle has a reputation as being community minded, progressive and ‘green’. The inner City of Fremantle votes Green at several times the national average. Fremantle has a reputation as being community minded, progressive and ‘green’. The inner City of Fremantle votes Green at several times the national average. Fremantle has a reputation as being community minded, progressive and ‘green’. The inner City of Fremantle votes Green at several times the national average. Fremantle has a reputation as being community minded, progressive and ‘green’. The inner City of Fremantle votes Green at several times the national average. Fremantle has a reputation as being community minded, progressive and ‘green’. The inner City of Fremantle votes Green at several times the national average. Fremantle has a reputation as being community minded, progressive and ‘green’. The inner City of Fremantle votes Green at several times the national average. Fremantle has a reputation as being community minded, progressive and ‘green’. The inner City of Fremantle votes Green at several times the national average. Fremantle has a reputation as being community minded, progressive and ‘green’. The inner City of Fremantle votes Green at several times the national average. Fremantle has a reputation as being community minded, progressive and ‘green’. The inner City of Fremantle votes Green at several times the national average. Fremantle has a reputation as being community minded, progressive and ‘green’. The inner City of Fremantle votes Green at several times the national average. Fremantle has a reputation as being community minded, progressive and ‘green'.

With this tension in mind, this paper aims to explore whether the desire for a more sustainable Fremantle is compatible with the protection of its built heritage or whether there is instead an intrinsic conflict between the two. It will draw on Australian and international research to show that while there are some tensions between sustainability and heritage objectives, it is the connection and compatibility between the two that are more significant. The paper will argue that, when viewed holistically, historic buildings and urban forms are often more sustainable than modern alternatives.

The paper, drawing on the work of Tim Beatley and others, goes on to argue that a greater convergence between heritage and sustainability goals can be achieved. However, this can only happen if the general public has a fuller concept of heritage; one that goes beyond the narrow focus on particular buildings and periods in history and instead is about an unfolding story of who we are, one that deepens our ‘sense of place’. It also recommends an expanded concept of sustainability that goes beyond just environmental protection. Sustainable development of the built environment needs to have a stronger focus on the social, cultural and economic aspects as well. When understood in this way it can be seen that sustainability and heritage can be allies in the protection and creation of meaningful and sustainable places.

Sustainability, heritage and the energy buildings use
Over the last few years the sustainability of the global environment has moved to centre stage on national and international policy agendas as the impact of global warming becomes more certain and the need to reduce greenhouse emissions more urgent (Stern 2006; Intergovernmental Panel on Climate Change 2007). As a result, we have seen a nationwide push for more energy and water-efficient buildings in Australia as articulated in the rating systems of 5 Star Plus (WA), BASIX (NSW), FirstRate (Victoria), NATHERs and AccuRate (National) as well as the Green Star ratings for commercial buildings. It is recognised internationally that many older buildings do not perform as efficiently as modern architecture designed with environmental sustainability in mind. Older buildings typically have higher energy costs to run. For example, the English House Condition Survey found that post-1980 houses were nearly 50% more energy efficient than pre-1910 houses mostly due to the non-cavity walls of earlier dwellings (Balderstone 2004). Similarly, London’s Camden Council has stated that ‘[h]ouses… built before 1976 are very energy inefficient, often requiring more than twice the energy to heat’ (Rundle 2005: 7).

Higher energy use in the operation of older buildings, however, does not tell the whole story about the relationship between sustainability and heritage buildings. While older building may often require more energy to heat and cool than their modern counterparts, when whole-of-life energy use of a building – including construction - is taken into consideration, the reuse of an older building may use less energy than if the older building was demolished and a new one constructed (Heritage Council of Western Australia 2007). As the NSW Heritage Office Discussion Paper on Heritage and Sustainability states: ‘the reuse of heritage assets lessens the need for the resources and energy required to build new structures… by retaining them in the existing structure’ (Coleman 2004: 15).

The energy retained in an already constructed building is called embodied energy. The CSIRO’s Selwyn Tucker defines
embodied energy as:

... the energy consumed by all of the processes associated with the production of a building, from the acquisition of natural resources to product delivery, including mining, manufacturing of materials and equipment, transport and administrative functions. (Tucker 2006: 7)

The amount of embodied energy in existing buildings is highly significant for those who care about greenhouse gas emissions and the sustainable use of resources. Donovan Rypkema (2005) argues that tearing down one small old building will negate the environmental benefits of recycling 1 344 000 aluminum cans. To give another example, the energy inherent in the material and construction of ‘a typical Victorian period house contains energy equivalent to 15 000 litres of petrol which is enough to send a car round the world five times, or half way the distance to the moon (Balderstone 2004 quoting a BRE report: 2). In fact, it has been calculated that ‘...the energy embodied in the existing building stock in Australia is equivalent to ten years of the total energy consumption for the entire country (Balderstone 2004: 2). These are highly significant figures for a nation that has a huge challenge in reducing its greenhouse gas emissions which are among the highest per capita in the world (Turton 2004: 7).

One implication of the substantial amount of energy embodied in older buildings is that if we are serious about sustainability we must go beyond just focusing on green building design (which is generally geared towards the construction of new buildings) to a stronger focus on restoration, reuse and retrofitting of existing buildings where this is available. As Carl Elefante argues ‘[w]e cannot build our way to sustainability; we must conserve our way to it’ (2007: 27, emphasis in original). Conserving older buildings for reuse is often a more sustainable strategy when we take into consideration that the embodied energy contained in the average office building is the equivalent of around 30 years of operating energy use for that building (Tucker 2006). The implication of this is that given the short life of many buildings (normally accepted to be less than 50 years for offices), it can be seen that embodied energy and construction energy use may be as significant as the energy used in the building during its lifetime. No wonder heritage advocates can legitimately claim that ‘heritage protection saves energy’ (Gunn et al 2001).

It is not only the energy that is embodied in our current building stock that has implications for sustainability, it is also worth considering the impact on the waste stream that demolished buildings make. The Ontario Construction and Demolition Waste Reduction Strategy Team estimated in 1996 that 20% of the total waste stream in Canada and the USA was made up of demolition and construction waste (Balderstone 2005: 4). In Western Australia the situation is even less sustainable as building and demolition waste accounts for up to 55% of the废物 sent to landfill in Perth (Department of Environment 2006).

When we recognize that older buildings contain large amounts of embodied energy and that their reuse stops large streams of demolition materials ending up as waste, the connections between sustainability and heritage become clearer and create a space that provides ‘the framework for and support to a sustainable, organic type of development – an ongoing improvement by adding value to what already exists rather than unsustainable development through cycles of demolition and growth’ (City of Fremantle 2006).

The City of Fremantle has tried to put this connection into practice in a number of ways. One is through encouraging the retention and adaptation of old industrial buildings associated with the port, such as warehouses, rather than their demolition. This strategy has had mixed success. It was done successfully in some cases, such as the Primaries (below left); semi-successfully in others, such as the 1950s Wool Store building where only the façade and floors will remain (below centre); and in other cases opportunities have been lost, such as the now demolished grain silos (figure 3).

To a large degree the debate over the retention of pre- World War II heritage buildings in Fremantle is over. Thankfully, there is broad consensus that these buildings ought to be preserved and protected ensuring the vast majority are no longer threatened with demolition. Instead the debate has shifted to broader questions of appropriate urban form within the city.

Density, sustainability and urban form

In recent years, municipalities from Nedlands to Fremantle to Port Dalhousie, Ontario have begun to feel the pressure of official development strategies that emphasise intensification over sprawl (Ascroft 2005; Parker 2005: 7). In Western Australia there has been growing pressure from the state
Development, mixed use and greater density around transport schemes, which were designed to maintain the low-rise scale of historic neighbourhoods, in order to maximize urban density. This is because higher urban densities are seen to contribute to a more efficient and environmentally sustainable city by reducing urban sprawl and the demand for new land. Higher densities also reduce unsustainable forms of transport by reducing car dependency and creating greater opportunities for public transport and walking and cycling. Density can also make city centres more economically sustainable by increasing the demand for local services and employment and better meeting the needs of population change (Newman and Kenworthy 1999). The result is that many of the key development debates in Fremantle are now at the broader urban design level, especially around issues of urban density and associated building height.

A call for higher densities based on sustainability outcomes has been heavily promoted by the Western Australian state government in recent years. Guiding state government documents such as the State Sustainability Strategy and Network City advocate increased densities in existing urban areas and projects which promote transit-oriented development, mixed use and greater density around transport hubs like Fremantle. This has created a potential point of conflict between the sustainability agenda of increased densities and the heritage agenda of protecting the amenity low-rise of historic places.

However, to define this debate between sustainability and heritage advocates over what is the most appropriate urban form as one which is dominated solely by conflict is to neglect the even stronger areas of compatibility. Heritage cities, such as Fremantle, already embody key attributes of a sustainable, compact urban form; pedestrian friendly streets, mixed use, and a sense of community. Fremantle is one of the few places in the Perth metropolitan area where you can live a comfortable car-free existence. Most of inner-city Fremantle was designed before the car and hasn’t been radically altered since its arrival. Consequently the sustainability benefits are substantial – walking distance to shops, good public transport hubs and convenient medium density, mixed use living. These connections between good urban design, heritage and sustainability could be further enhanced as some sustainability and heritage advocates in Fremantle are keen to reinstate Fremantle’s historic tram networks with a combination of historic and modern trams (Winterbourne 2006).

The debate over urban form, density and heritage has been part of a recent controversy over the proposed ING development on Victoria Quay next to the Fremantle Port. The original plans for the ING development were for buildings up to seven storeys high. This is far greater than the traditional two to four storey height of buildings in the historic West End of Fremantle onto which the development abuts. This increased density was in part justified on sustainability grounds. The developers argued that the development was a Transit Orientated Development as it is next to the train station and that these heights were needed to make the levels of commercial and retail space commercially sustainable (Chmielewski and Edghill 2007). Despite these sustainability claims, a clear majority of Fremantle residents have opposed the density of development on the basis that it will undermine the historic built form of Fremantle and the City’s connection with the port amongst other issues.

The ING development is singled out in this paper because it is the biggest single development proposal in Fremantle’s recent history. But the debates between heritage and sustainability advocates about what height, bulk and scale is most appropriate for historic Fremantle will continue as the city looks to be part of the redevelopment of major sites to the south of Fremantle and to the east end of Fremantle’s central business district.

Making Place: strengthening the connections between sustainability and heritage

In the previous sections I have sought to provide some brief illustrations of the ways in which heritage and sustainability interact and show that there are both points of tension as well as compatibility. In this section I want to show that the points of compatibility go deeper than issues of energy use, density and urban form to also include more fundamental connections that exemplify how sustainability and heritage can be mutually supporting.

An emerging theme in the literature on sustainability is the importance of ‘commitment to place’ or ‘sense of place’ (Thayer 2003). It is increasingly recognised that shifts towards a more sustainable society are more easily achieved when people have an attachment to the places in which they live and work, because they are more likely to look after, care for, and act sustainably within places that they have a connection with and are committed to. Unfortunately, as Tim Beatley (2004) argues, modern developments are too often characterised by a ‘mind-numbing sameness’, that undermines a commitment to place and shifts towards a more sustainable society.

The growing uniformity and anonymity of contemporary settlement patterns begets an attitude that they are disposable and interchangeable. One is just like another. Without intimate contact with real places, there is little chance that the loss of environments and practice of unsustainable patterns of consumption and resource exploitation will be reversed (Beatley 2004: 3)

In contrast to a lot of modern development, historic places instead are defined by their uniqueness and particularity rather than by sameness, uniformity and anonymity. As Beatley states: ‘Much that is distinctive or special about a place is a function of its unique history, the heritage of its built environment, and the natural and ecological conditions in which this built form co-evolves over time. History and heritage help in fundamental ways to define a place’ (2004: 55). The preface to The Burra Charter similarly states: ‘[p]laces of cultural significance enrich people’s lives, often providing a deep and inspirational sense of connection to community and landscape, to the past and to lived experiences’ (AustraliaICOMOS 1999). Heritage places are more likely to encourage a stronger sense of place and place commitment - places that people are connected to, care about and which enhance their quality of life. This stronger sense of place in turn results in the stronger possibility of creating more sustainable practices. This is because reconnecting people and places at the local level and having a better understanding of the built and natural surroundings in which we live will result in better more sustainable lives. As Beatley argues appreciating and protecting our landscapes and our built heritage will necessarily lead us down the path to a more sustainable society (2004: 17).
Underlying the connections between heritage and sustainability is a set of shared values and a desire to change the modern mindset so that it better values both our built and natural assets. Both heritage and sustainability want to replace a culture of consumption, disposability, novophilia (the love of what is new merely because it is new) and waste with a culture that instead emphasises conservation, preservation, reuse and recycling.

**Strengthening the connections between heritage and sustainability**

While there are clearly strong connections between sustainability and heritage perspectives these could be further strengthened through a fuller understanding and a widening of each approach. For example, sustainability is not just about environmental protection as was sometimes assumed in the 1970s and 80s, but it is also about simultaneously pursuing outcomes that address economic, social and cultural issues. The WA State Sustainability Strategy defines sustainability as ‘[m]eeting the needs of current and future generations through an integration of environmental protection, social advancement and economic prosperity’ (Government of Western Australia 2003: 4). The sustainability impact of heritage conservation becomes much clearer when sustainability is understood in this broader context and goes beyond solely environmental concerns. From a broader sustainability perspective the positive impacts of heritage conservation also include the improvement to neighbourhoods, the generation of tourism and more meaningful community engagement while acting as a significant engine of economic development. As Balderstone (2005) argues on the basis of the results of the Victorian government’s Public Heritage Program:

> In relation to social sustainability, heritage places contribute to community identity, and their conservation, interpretation and presentation can be a source of pride and well-being. The ongoing use and profile of such places can contribute to community cohesion and social capital, through bringing people together for a shared purpose.

Just as a broader notion of sustainability has stronger connections with heritage, a broader notion of heritage will allow for heritage to have stronger connections with sustainability concerns. Contemporary thinking on heritage makes it clear that heritage is no longer confined to individual buildings or to a particular period in time (Coleman 2004). Instead heritage is understood as a cultural landscape - one that is able to evolve and change. Contemporary heritage also needs to include often under-represented heritage aspects such as multicultural and indigenous heritage, natural landscapes, and buildings and structures of the past 50 years. An expanded view of heritage in these ways would greatly increase the connections and overlap with sustainability.

Fremantle’s concepts of sustainability and heritage are still evolving. Both within the City of Fremantle Council and the Fremantle community sustainability is still often perceived as primarily environmental protection and an integrated triple bottom line approach is only just emerging. As well, heritage is often narrowly perceived focusing on 19th century buildings and streetscapes to the neglect of indigenous history and 20th century multicultural influences, structures and buildings. As Fremantle embarks on a renewal of its city centre and the east end of the central business district (an area dominated by buildings from the 1960 and 70s) it will be interesting to see whether any of the buildings in this area are considered worthy of retention on either a heritage or sustainability basis and whether their contribution to an evolving sense of place is valued.

**Conclusion**

Although there has been little research in Australia exploring the connections between sustainability and heritage it is clear that the connections between them outweigh the tensions. While differences remain between the agendas of sustainability and heritage, such as sustainability’s desire for higher densities and buildings that are more efficient, these differences cloud some important ways in which the sustainability and heritage agendas are compatible.

A more holistic look at energy use shows us, as the heritage slogan states, that ‘the greenest building is …one that is already built’ (Elefante 2007). Similarly it is increasingly recognised that the urban form of historic towns is often an excellent model of sustainable planning; good for the environment, community and the economy. Perhaps the most fundamental connection however is in how heritage is central to creating a sense of place - a key foundation of sustainability. Indeed it is becoming clear that sustaining place helps us create sustainable places and that a desire for sustainable places will encourage us to sustain place (Beatley 2004: 17).

The debates in Fremantle have mirrored these emerging international debates. Fremantle can be proud of its sustainable retention and reuse of many of its historic buildings. The challenge over the coming decade will be to more deeply integrate the sustainability and heritage agendas in the struggle against soulless, inappropriate and unsustainable development. This needs to happen if we are going to preserve and create places that are both sustainable and meaningful into the future.

**Bibliography**


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Endnotes

1 It is worth noting however that early studies by the US Energy Research and Development Administration also showed that the least energy-efficient structures are those built between 1940 and 1975, owing to the tendency of pre-1940 buildings to maximize natural sources of light and ventilation, and to their siting in relation to environment and climate (Heritage Canada Foundation Report 2005, pp.10-11).

2 Network City’s Action Plan aims to ‘[p]rovide 60% of required dwellings in existing urban areas and 40% in new growth areas’ (Western Australia Planning Commission 2005).