

Green and open space planning for urban consolidation – A review of the literature and best practice

Jason Byrne and Neil Sipe



Urban Research Program

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Urban Research Program
Griffith University
Brisbane, QLD 4111
www.griffith.edu.au/urp

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About the Authors

Dr Jason Byrne is a lecturer in the Griffith School of Environment and an academic member of the Urban Research Program.

Associate Professor Neil Sipe is head of the planning discipline in the Griffith School of Environment and an academic member of the Urban Research Program.

Email: jason.byrne@griffith.edu.au
n.sipe@griffith.edu.au

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Introduction

Australian cities have undergone profound reforms over recent decades, as politicians, decision-makers and planners have sought to ensure our built environments remain liveable and can adapt to new lifestyles and demographic trends. Urban consolidation is one of these reforms.¹ Urban consolidation is a growth management policy that aims to direct growth away from green-field sites at the metropolitan periphery by increasing density in existing built environments, through smaller suburban lots and higher density dwellings – especially within the inner city.² The term is also related to, and sometimes conflated with, ‘urban containment’, ‘smart growth’, ‘urban renewal’, urban revitalisation’ or simply ‘densification’.³⁻⁵ Proponents of consolidation argue it will lead to more efficient use of existing infrastructure and services, while simultaneously delivering multiple benefits such as: protecting valuable green-spaces on the fringes of metropolitan areas; reducing traffic congestion and pollution; and even combating obesity and sedentary lifestyles.^{3, 6-10}

But various community groups and urban scholars have criticised urban consolidation, arguing that it compromises the character and heritage of inner city neighbourhoods, for example by losing precious public open space to urban infill, by placing residents in noisy locations, by concentrating social disadvantage, and by potentially undermining social cohesion.^{4, 11-14} Such criticisms are certainly warranted in places where planners have failed to carefully manage consolidation to preserve the public domain, thus compromising residential amenity and the character of targeted neighbourhoods - for example by developing ‘surplus’ parkland for housing. This is especially the case where consolidation has been ad-hoc rather than managed through redevelopment schemes. The incremental demolition of single family houses and replacement with ‘six-pack’ and ‘twelve-pack’ style apartment blocks has incurred the wrath of many anti-consolidation community groups, largely because these types of developments can reduce privacy, increase noise levels, worsen road traffic, increase on-street parking and decrease greenspace within neighbourhoods, with little or no mitigation on the part of developers.^{11, 15-17} Some planners, leisure scholars and greenspace theorists now suggest that Australian planning systems may not be capable of responding to the challenges that densification and concomitant population increases place on urban open spaces and greenspace.^{2, 18-21}

This review is a component of the Queensland Department of Infrastructure and Planning and Brisbane City Council’s ‘Liveable City Strategy’. The strategy will provide opportunities to enhance and interconnect public spaces to improve amenity within Brisbane’s core urban area. A key focus will be: (i) identifying and protecting an ‘integrated public space network’ for the plan area; (ii) incorporating existing parks and squares with new spaces and linkages to the Brisbane River; and (iii) providing a public space network that will facilitate active recreation and healthy lifestyles. The strategy will also focus on the critical role of the Brisbane River.

Study area

The study area covers the inner 5 km of Brisbane City, including suburbs such as Auchenflower, Balmoral, Bowen Hills, Bulimba, Coorparoo, Dutton Park, Hawthorne, Highgate Hill, Kangaroo Point, Kelvin Grove, New Farm, Newstead, Norman Park, Paddington, Spring Hill, Toowong, West End and Woolloongabba (see Figure 1). Many of these suburbs have experienced increased residential densities in recent years, associated with various forms of consolidation, placing pressure on parks and other open spaces.⁵ One of the goals of the liveable cities strategy is to prevent some of the problems referred to above, by retaining the qualities that make Brisbane special. To do this, decision-makers are looking to the literature on urban open space, parks, plazas, boulevards and other types of greenspace, as well as to best practice in other cities, for guidance.

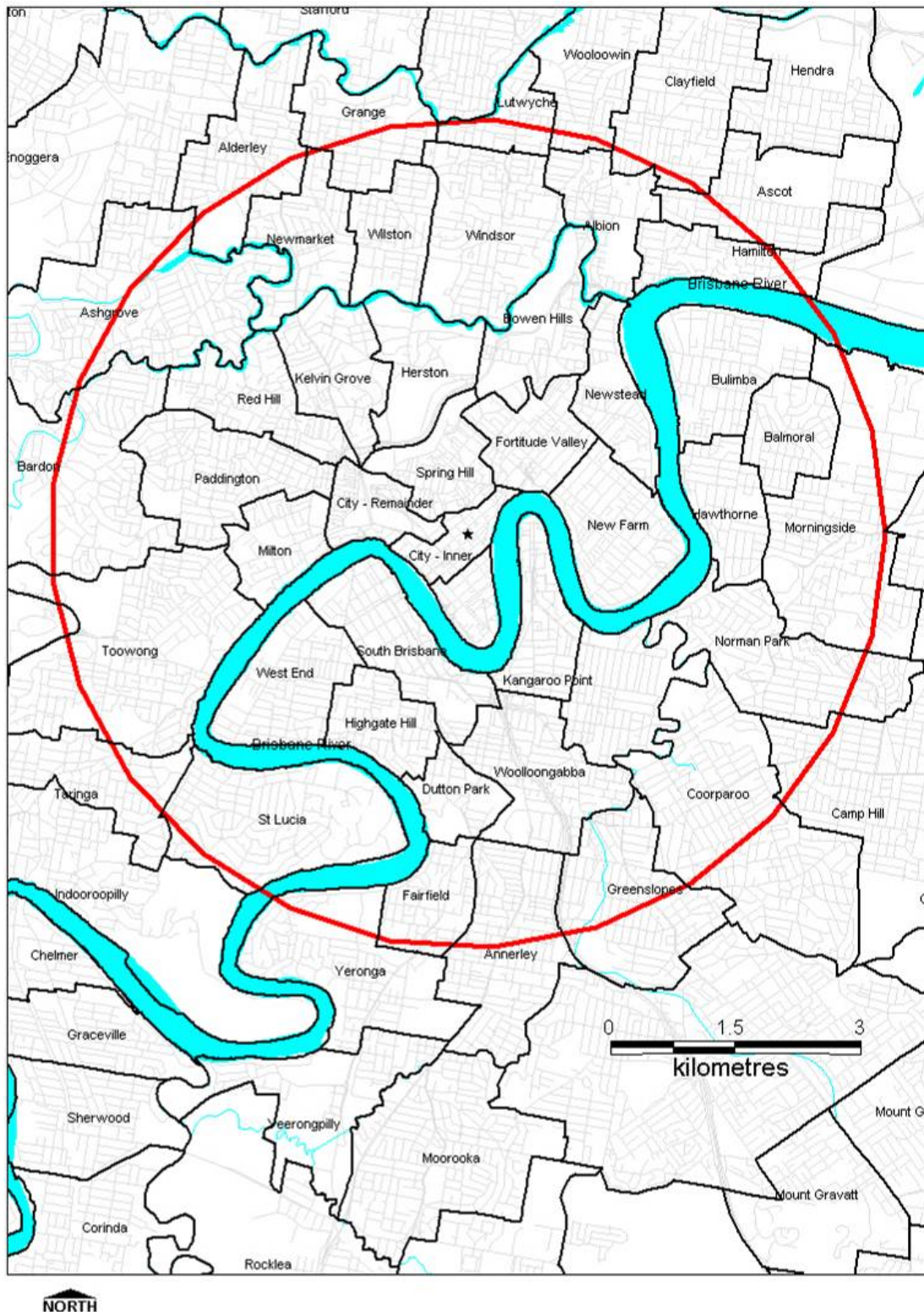


Figure 1: Study area

What types of spaces are being considered?

According to the Brisbane City Council, urban open spaces include: parks, sporting fields, bushland, creeks, the Brisbane River, Moreton Bay, private backyards and gardens, courtyards and balconies, attractive and safe streets, plazas and entrances to shopping centres, community gardens, bikeways and paths, spaces around libraries and art galleries and links between these elements.^{22, 23} A better definition would arguably be limited to publicly accessible green and open spaces and would therefore exclude private backyards, gardens and balconies. But it would

include communal space around apartment buildings, cemeteries, rock walls, street verges and medians, school grounds, rooftop parks, stormwater channels, surplus parking lots and may include open-air, publicly accessible shopping malls that provide opportunities for passive recreation.^{24, 25}

Scope and purpose of the review

This literature review covers recent research, planning standards and best planning practices for public urban space and greenspace planning. The purpose of the literature review is to enable a comparative analysis of the amount and quality of public urban and open space in other capital cities relative to Brisbane, considering examples of successful public spaces and their characteristics (e.g. dimensions, function, land use context and so forth). In the review we also consider, wherever possible, existing and emerging leisure patterns, employment patterns, housing preferences, household structure, lifestyle preferences, travel patterns, location preferences and the interrelationships between these factors. We draw these facets together to develop a typology for defining/categorising types of urban public space (specifically considering the role and function of various public/private tenure arrangements for managing ‘public space’). The ultimate purpose of the literature review is to provide a foundation for a detailed physical audit of Brisbane’s greenspace and public open space environments to facilitate better management and to enable the selective densification of some urban areas that policy makers deem suitable for ‘infill’ development and urban consolidation.

The review has included both scholarly research and publications and professional/lay publications. Material for the review was sourced from an extensive search of electronic databases, online publications and a reference collection of over 600 scholarly titles on parks and open space (see Appendix 1). The review has also considered international, national and state planning standards for urban green and recreational open space, to help planners and policy makers put the demands on Brisbane’s urban greenspace within a national and international context. However, the review has not attempted to comprehensively address government documents or strategies on open space and greenspace (e.g. design guidelines, policy statements, area studies) unless they were seen as being exceptionally relevant. Finally, the review has sought to index public space provision within the study area against cities in Australia and internationally.¹

Greenspace research

Over the past three decades research on parks and other types of greenspace has flourished. There is now a considerable body of scholarly work on urban greenspace, covering topics such as design, use of greenspace, greenspace values, environmental equity and the like. In this review, we limit our discussion to topics that are directly relevant to urban consolidation, namely: density and greenspace interactions – with a focus on equity and social justice, and we examine reasons for providing greenspace. We consider among other things why people use greenspace, how they use greenspace, the various factors that shape the use of greenspace, how the characteristics of greenspace in turn affect its use, and the many benefits of greenspace for its users.

Density and greenspace interactions

For some time now there has been an ongoing debate about the impacts that increased density has on urban greenspace use. Some theorists suggest that as density increases we should increase

¹ We recognise that the review is not exhaustive. It is likely that some relevant material has been omitted due to time limitations and resource constraints. Nonetheless, we are confident that we have reviewed the most current and relevant material. The authors welcome suggestions for additional material that we should consider in future research.

the amount of greenspace in a locality, thus offsetting the loss of private backyards.^{15, 16, 26-38} The theory is that residents will compensate poor access to private greenspace by using public greenspaces such as parks – a notion referred to as the ‘compensation hypothesis’.³⁹ The idea sounds plausible but is this really the case?

Recent research suggests that we should not assume that just because people live in denser environments with little access to private greenspace they will necessarily use neighbourhood public parks and other greenspaces more frequently.³⁹⁻⁴¹ Indeed, a paradox of urban consolidation is that it may actually stimulate leisure-based travel, as city dwellers seek to escape to the countryside or other places for leisure and recreational experiences.^{39, 42-47} And existing parks and other greenspaces in higher density areas may be so congested with users or attract a clientele of ‘undesirable users’ that these parks may actually repel further use, making urban consolidation - without additional greenspace - highly inequitable.^{25, 48-50}

There are three important factors to consider when planning for increased density and park use: (i) different types of people who live in higher density built environments will have different greenspace needs; (ii) because consolidation always involves existing built environments planners need to contend with how to integrate existing greenspaces into denser built environments – many parks for example will have historically been designed for a different clientele than the residents that consolidation brings; and (iii) the character of built environments has been shown to affect how people use urban greenspaces – urban design must ensure that greenspaces are easy to get to, safe and have high levels of environmental quality. The design of higher density development must therefore entail careful thinking about the greenspace needs of future residents relative to the capacity of the built environment to meet those needs.^{25, 50}

Higher density residents and their greenspace needs

One of the problems with the simplistic notion that more parks are required when density is increased is that it does not consider the characteristics of people living in higher density environments. The idea assumes a homogeneous population of townhouse and apartment dwellers who need access to a generic park. And a common misconception is that small household live in small dwellings.⁵¹ But if we take a closer look at who lives in townhouses, mid-rise and high-rise apartments in Australia, we find that populations are differentiated by income, age, sex, household composition and the like.^{11, 4} In other words, there is no typical ‘higher density resident’. This has prompted some commentators to suggest that there is excess park capacity in many inner city areas. But a closer look at the inter-relationships between greenspace users and greenspace characteristics suggests that we need to be very careful when planning for greenspace in urban consolidation projects.

People live in higher density dwellings for a variety of reasons. In some cases, but not all, apartments are cheaper than single-family houses, so income plays a role.⁵⁶⁻⁵⁸ Some researchers have found that lower-income residents need better access to parks and open space because they cannot afford other forms of leisure (e.g. ski trips, horse-riding or golf).^{57, 58} But not all higher density residents are impoverished. Many people seeking to live in apartments are actually older retirees seeking a ‘sea-change’ lifestyle, close to beaches and amenities. These residents choose to

¹¹ We note that many Australian cities are markedly different to their American and some Asian counterparts. In many cities in the United States that have not experienced large-scale gentrification, it is the poor who live in inner city locations, oftentimes in sub-standard housing and in semi-industrialised locations, with very limited access to urban greenspace.³⁷ Typically these residents are also ‘people of colour’ – that is so-called minorities – who are marginalised and vulnerable e.g. ‘Latinos’, ‘African-Americans’, ‘Native Americans’ etc. In South American and some Asian cities similar patterns exist, especially within squatter communities.^{52, 53} And of course in larger Australian cities like Sydney and Melbourne, there are still substantial pockets of ‘concentrated poverty’ where lower-income immigrant groups live in crowded conditions with comparatively poor access to urban greenspace.⁵⁴ Some European cities are now exhibiting similar patterns as processes of globalisation concentrate undocumented workers in urban centres.⁵⁵

live in luxury apartments to be close to shops, restaurants, entertainment venues and public transit routes; they usually have higher disposable incomes. Researchers have found that older people are less inclined to use parks and other greenspaces for reasons related to personal mobility, health and fear of other park users.⁵⁹⁻⁶³ So there is an interaction effect here between density, income, age and park use that is difficult to tease apart.

The situation becomes even more complicated when we consider the presence of children in higher density dwellings. We might expect that people who live in apartments will have few if any children.⁶⁴ This is partly the result of development industry stereotypes of apartment dwellers, and partly the result of past self-selection practices based on concerns about the stigmas of higher density housing and the practicalities of needing room to raise children.⁶⁴⁻⁶⁷ But a closer inspection of demographic data and recent research shows that increasing numbers of Australian apartment dwellers and inner city residents have children (this is the norm in high density Asian cities).^{1, 50, 68-71} Younger people with children may not be able to afford a single-family house – at least within reasonable commuting distance of workplaces, but lifestyle values may play a role too. Some generation X and Y parents may choose to stay in inner city areas because they enjoy the cosmopolitan lifestyles on offer and are unprepared to leave higher density locations for suburbs they perceive as bland and boring.^{72, 73}

Researchers have found that children living in higher density housing have a greater need for publicly accessible greenspaces for play, mental health and social and physical development.^{35, 71, 74-}

⁸¹ While parents living within apartments may not be avid park-goers for their own benefit, they often visit parks so their children can play and vent excess energy.^{82, 83} Apartment living means that time that would otherwise be spent on yard maintenance is available for taking children to parks for socialising and relaxing, even if this means forgoing personal recreation.^{74, 84} Children's sporting activities may also necessitate night-time and weekend visits to playing fields.^{85, 86} Apartment living may place unique demands upon children who may lack the private play spaces enjoyed by their low-density counterparts. Children need space to play away from traffic, where their parents can monitor them, and where their play will not disturb other apartment-dwellers. Yet most consolidation to date has failed to cater to children's needs.⁵⁰

These various considerations mean that open space and greenspace near higher density dwellings must cater to very diverse populations – older people, children, adolescents, parents, wealthy people and the poor – with diverse expectations about the functions that greenspace should perform.^{55, 87-92} A 'one size fits all' approach to greenspace design for higher density areas will be prone to failure.

No two parks are the same

A second issue is that few scholars and practitioners have recognised that urban greenspace is as widely differentiated as the populations who rely upon it. No two parks are the same. Parks differ according to their age, levels of maintenance, facilities, and size – partly due to the philosophy that motivated their creation and partly due to land development processes and municipal fiscal constraints.^{93, 94} Parks differ according to their age because different ideas about the benefits parks provide have historically informed the people who design and develop parks.^{95, 96} Early parks like Hyde Park in Sydney were created when colonial planning authorities required setting aside of open spaces for new settlers.⁹⁷ These parks – among the oldest public parks in the world – typically featured a long walk or 'promenade' where the gentry could stroll.⁹⁸ Later, when urban reformers in Europe and North America sought to manage the large populations that swelled industrial cities, ideas about parks changed.⁹⁹ Parks became 'democratic' spaces, melting pots where people from all walks of life could mingle; though there was another agenda at play too.⁹⁶ Park reformers believed that working class residents and immigrants needed access to nature to make them more civilised. By mingling with the gentry in immaculately landscaped spaces, it was

believed the working class would adopt the morals and values of the elite.^{100, 101} Central Park in New York, completed in 1873, is an example of such a park created during this time.^{102, 103}

Australian planners emulated these ideas. The new urban parks featured expansive gardens, expensive embellishments like fountains, benches, meandering walking paths and lakes, and ornate fixtures like bridges, signs, statues, lamp-posts and even bandstands and pagodas.⁹⁸ And like their European and North American counterparts, these parks had a code of conduct enforced through park rules and park police.^{100, 102} These parks were often connected to large tree-lined boulevards that transected the city, and these various greenspaces were collectively regarded as the 'lungs of the city', purifying noxious air and cooling the hardscapes of roads and buildings alike.¹⁰¹ Older Australian parks show how these ideas became enmeshed in the built environment (see Figures 2-4).

But it was not long though before the ideals of elaborately landscaped urban parks met the practicalities of providing recreational opportunities to the masses. At the same time a new philosophy of parks suggested that what was needed most were opportunities for citizens to exercise – to strengthen and discipline bodies, to temper immoral impulses and to give people a place to vent frustrations and escape from urban life.^{96, 104, 105} The 'recreation movement' witnessed the paring down of parks to more closely resemble what we now call playing fields, with little ornamental vegetation, large expanses of grass, places for people to sit, with clubrooms for sporting teams, and facilities like goal posts, basketball hoops and cricket pitches.^{106, 107}



Figure 2: Promenade, Hyde Park, Sydney



Figure 3: Botanic gardens, Brisbane

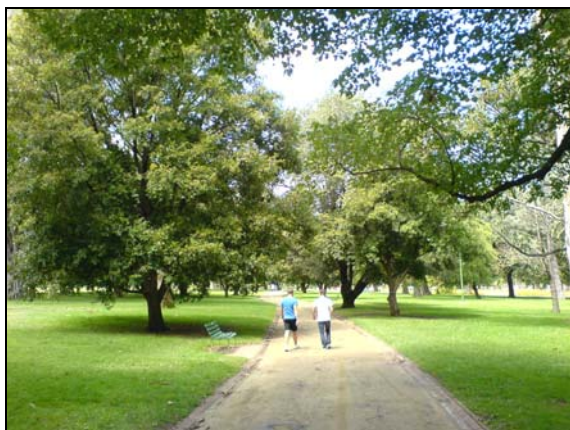


Figure 4: Park boulevard, Melbourne



Figure 5: Ecological park, Ipswich

More recently Australian park planners have been confronted by a new set of demands. Parks since the 1970s have increasingly been required to perform ecological functions – like stormwater interception and retention, providing habitat, preserving remnant vegetation, cooling urban temperatures and the like. Australian park planners have sought to incorporate ecological

principles into park-design and – like their European and North American counterparts, these newer Australian parks are more likely to include generous use of native vegetation, to protect watercourses and wetlands, and to provide spaces for wildlife as well as people (see Figure 5).¹⁰⁸⁻

¹¹⁰ But at the same time, growing fiscal constraints have meant that less funding is available to spend on park maintenance. The quality of park spaces in the older middle ring suburbs has arguably deteriorated as a result.¹⁷

This colourful history of park-making has endowed Australian cities with a wide variety of parks and green spaces. Inner Brisbane for example is characterised by a diverse array of greenspaces including botanic gardens, riverfront parks, playgrounds, ecology parks, boulevards, playing fields, civic squares, community gardens, farmers' markets, rainforest walks, and even an urban beach at Southbank. It is logical that the quality, function, size, landscaping, and facilities of these varied greenspaces will affect how people use them. But the character of the built environment surrounding parks also affects how greenspaces are used.

How built environments affect greenspace use

A final consideration with regard to density and greenspace is that researchers have demonstrated that the nature of built environments impacts how people use urban spaces.¹¹¹⁻¹¹³ Built environments that feature greater connectivity are more likely to foster physical activity than those designed to limit traffic flow.¹¹⁴ In other words, grid street patterns seem to lead people to exercise more than culs-de-sac. The main reason for this is that connectivity promotes walking for exercise and transport. People who live in neighbourhoods with a grid street pattern appear more inclined to walk to their local shops, use their local parks and walk or cycle to work than those who live in culs-de-sac neighbourhoods, because distances to these various destinations are more direct and thus take less time. Longer distances appear to promote car-based travel and sedentary lifestyles.^{7, 8, 113, 115-120}

Ironically, the history of planning and property development in Australian and American cities means that inner city neighbourhoods, which typically have grid street patterns, are less likely to contain parks – especially large ones – when compared with suburban neighbourhoods.⁸⁵ And because park planning ideas changed post-second world war, suburbs which developed after that time are more likely to feature larger neighbourhood and regional parks.^{34, 121} As we shall discuss in the next section, having good access to parks and other kinds of greenspace promotes wellbeing and health.¹²²⁻¹²⁷ People with better access to parks and other greenspaces have been shown to live longer, are less stressed, become ill less often and are less likely to be overweight or obese.^{31, 33, 77, 88, 90, 128-138} The one exception here is that people appear more inclined to travel further to visit and use parks and greenspaces that are aesthetically pleasing, have larger areas of vegetation, and offer a wide variety of activities and services, irrespective of their size (recognizing of course that larger greenspaces are more likely to possess such characteristics).^{47, 139, 140}

Researchers in the US and Europe have also found that greenspaces that are connected with other green or open spaces through walking and cycling trails or greenways promote higher levels of physical activity and encourage more visits and longer stays.¹⁴¹⁻¹⁴⁶ What this means for any consideration of the role of greenspace in urban consolidation is that planners and policy makers should ensure that higher density neighbourhoods feature: (i) streets with good connectivity; (ii) good vegetation cover; (iii) a variety of facilities like benches and water fountains; and (iv) should also connect existing greenspaces via walking trails, cycleways, greenways or other such connective features.¹⁴⁷

Reasons to provide greenspace

Parks and other greenspaces play multiple roles in making our cities more sustainable.³² These include nature's services/ecological benefits (e.g. preserving biodiversity), social benefits (e.g.

The multiple benefits that greenspace provides can be categorised into ecological, social and economic benefits. A brief overview of these benefits helps to better contextualise greenspace acquisition and development.

Ecological benefits

Parks and other greenspaces provide many ecosystem benefits, such as regulating ambient temperatures, filtering air, reducing noise; sequestering carbon and attenuating storm-water.¹⁵⁹⁻¹⁶¹ Aside from these human benefits, carefully designed urban greenspaces can also protect habitats and preserve biodiversity.¹⁶²⁻¹⁶⁴ Greenspaces that feature good connectivity and act as ‘wildlife corridors’ or function as ‘urban forests’, can maintain viable populations of species that would otherwise disappear from built environments.¹⁶⁵⁻¹⁶⁷

Social benefits

Urban greenspaces also provide a range of social benefits. Many studies show parks offer urban residents solace from their stressful lives, hasten recovery from disease or illness, and can foster active living, combating sedentary lifestyles associated with obesity, heart disease and several types of cancer^{31, 133, 137, 168-175}. Community gardens, which have become a recent feature of many inner city parks, can give residents space for social interaction and enable people to supplement their diets with fresh fruit and vegetables.¹⁷⁶ They may also foster closer community ties.^{133, 177-179} Parks can moderate incivility and cultivate child development.^{25, 180-185} Given the opportunity, most children would prefer to play in outdoor spaces that provide them with a range of sensory experiences and which help them to refine their motor skills.^{79, 186, 187}

Economic benefits

Finally, researchers have found that parks and greenways provide significant economic benefits. These include promoting tourism, lessening environmental impacts (e.g. carbon sequestration, stormwater attenuation), reducing pollution through decreased car-dependence by providing alternative transportation corridors, and reducing health care expenses by fostering healthy living (e.g. promoting regular exercise).^{36, 55, 56, 62, 87, 153, 159, 171, 188-190} Parks exert a significant beneficial impact upon nearby property values.¹⁹¹⁻¹⁹⁸ Properties located near parks and greenways have been found to have higher re-sale value and homeowners value these spaces as important attributes when making decisions about residential location and housing choice.¹⁹⁹⁻²⁰¹ Finally, a likely future economic benefit of urban greenspace is in adapting cities to the anticipated impacts of climate change such as higher temperatures, increased flooding, increased storminess and the like. Greenspace that is well integrated into urban environments will likely lessen the severity of many of these anticipated problems – providing significant economic benefits.^{154, 202-205}

Synopsis

In summary, the literature suggests that past ideas about who lives in higher density residential areas may be wrong. Research shows that higher density residents are widely varied, differing by age, income, race/ethnicity, household composition, family status and the like. Different types of people use parks and other kinds of greenspace for a variety of reasons, based upon their needs, preferences, available time and physical capabilities. Older people are generally less likely to use large park spaces than younger people. Working families may face time constraints limiting the time they can spend visiting parks and greenspaces, but may generally need more frequent access to pocket parks for walking young children and easy access to sporting/recreation facilities for older children’s sports. Adolescents and young singles may require spaces for active recreation such as skateboard parks, ovals for sports, tennis courts, swimming pools and even rock climbing walls as well as spaces to socialise away from the public gaze.^{35, 78, 80, 92, 186, 206-208}

Complicating these patterns of greenspace use is the fact that older parks were often designed with different uses in mind than those resulting from urban consolidation. Australia’s early park

designers never envisaged the invention of Frisbees, archery parks, rollerblades or community gardens, and spaces like lawn-bowls greens or cricket ovals cannot accommodate such demands. Older parks located within the inner suburbs are often smaller than their suburban counterparts, are more likely to feature promenades, fountains and ornamental gardens rather than expansive grassy areas, and may be less able to accommodate the diverse demands that higher density lifestyles and increased numbers of residents would place upon them. Any proposal to increase residential densities in inner city areas should first consider the availability and characteristics of urban greenspace. Such an exercise requires a typology for classifying various greenspaces - that is the purpose of the next section of this report.

A typology of urban green/open spaces

There are various ways to classify urban open space and greenspace, such as its size, how people use it, its intended function, its location etc. Here we review the literature and suggest a framework for classifying greenspace that does not lock planners into rigid categories – as new types of greenspace are always being developed – but rather recognises the dimensions of greenspace that are important when planning for consolidation (i.e. size, naturalness, activity types etc.). We limit our discussion to parks, plazas, urban trails and streets, though other typologies that include cemeteries, rail reserves, roof-tops and the like are also possible.

Parks

Even a casual inspection of most local authority web pages reveals some form of typology that has been applied to classify park, greenspace and open space assets. Typically classification schemas are based upon the size of the park, its deemed function, its geographic location and the types of facilities present within the park and sometimes the degree of naturalness of the park. Figure 10 below shows how these typologies are operationalised. Parks can be variously described as urban parks, nature parks, pocket parks, district parks, community parks, neighbourhood parks, sporting fields, urban forests and the like (see Table 1 for examples).²⁰⁹ But there are other ways of classifying parks too. These include factors such as the activities that occur within the park (e.g. cricket oval, skateboard park, bowling green), the agency responsible for managing the park (e.g. national park, state park, city park), the history of the park (e.g. heritage rose garden or Bora Ring^{III} park), the condition of the park, the land use history of the area (e.g. Victorian-era park or street-corner neighbourhood park), the types of people who use the park, landscaping and embellishments (e.g. sculpture park, dog park, bike park or Chinese garden) and the philosophy behind the park's development (e.g. recreation reserve or civic square).²¹⁰ Combining these various factors can result in all sorts of combinations and permutations, rendering a standardised method of classifying parks virtually impossible and rather pointless.

^{III} A Bora Ring is an Aboriginal Australian ceremonial ring – typically made of stones. The North Burleigh Bora Park is an example.

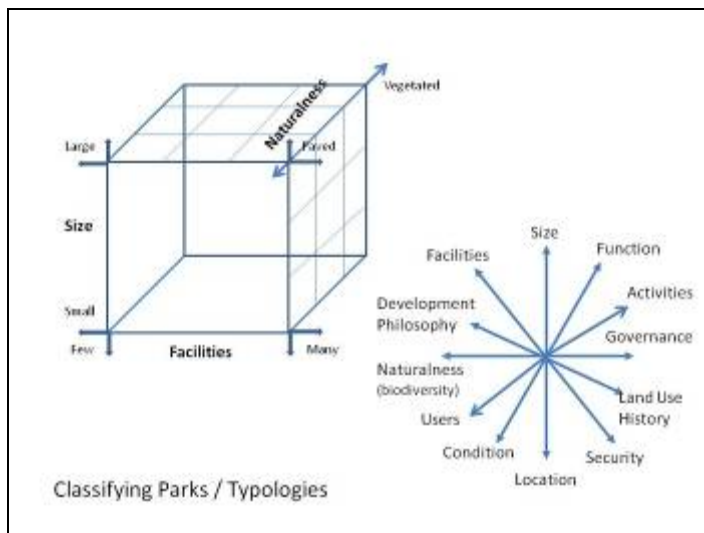


Figure 10: Typologies of parks

Making the task of classifying various parks all the more difficult is the issue of scale. As the first public parks evolved from scattered parks into organised greenspace systems, a philosophy of ‘nesting’ emerged (see Figure 11). What we mean by this is that park administrators believed that various sorts of parks held certain functions. And these functions were related to the size of the park. So for example, a national park is a very large greenspace which is seen to have iconic value and national significance (e.g. Yosemite, Yellowstone, the Blue Mountains, Mount Tambourine). National parks, by virtue of their size and the landscapes they contain, attract visitors from around the globe. In other words, they have very large catchments or ranges. Because these parks are so big, there are fewer of them. As we noted earlier, following the Second World War, as suburbanisation escalated in developed countries, newer types of park arose, such as the regional park. These parks are typically not as large as national parks and serve smaller populations. As their name implies, such parks are believed to have regional catchments – that is they serve areas that are typically comprised of several municipalities.²¹¹

Regional parks also typically contain many more facilities than smaller parks, because they are believed to serve relatively large populations. Examples of these facilities include archery ranges, equestrian facilities, water-sports (e.g. sailing or rowing), football ovals and the like. District parks are designed to serve several neighbourhoods whereas neighbourhood parks – also termed community parks – serve a single neighbourhood. Finally local parks serve a few blocks and pocket parks a single street. As Table 1 indicates, pocket parks can be very small, consisting of not much more than a bench, some trees and a small patch of grass. Nature strips and traffic islands are not really parks. They tend to be the most common type of urban greenspace though, typically because they represent left-over space that developers cannot use. Sited at the end of streets, alongside busy intersections or next to canal-heads, they have very little active recreational value. But carefully planted and maintained, they nonetheless can contribute to the overall aesthetics of an area and provide visual and psychological relief from the built environment.

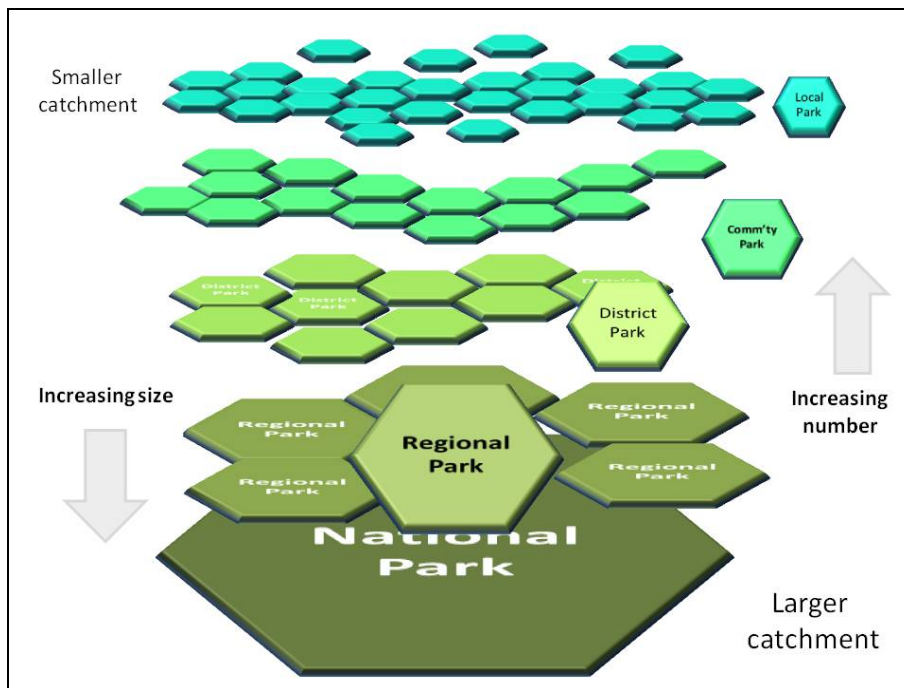
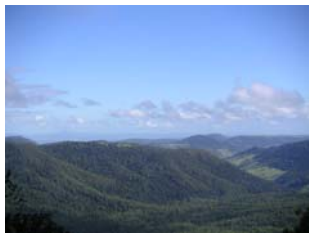


Figure 11: Park nesting and range

Many scholarly studies of urban greenspaces have also sought to classify parks according to typologies. Kevin Lynch has made a lasting contribution. He identified greenbelts, green wedges, regional, suburban and city parks, linear parks, plazas, playing fields & lots and playgrounds as well as ‘wastelands’ as various types of urban green/open space. A number of authors have since proposed assorted ‘theoretical’ typologies based on his suggestions.^{95, 96, 108, 109, 161, 212} But these schemas are all only partially suitable for the purpose of our review, because they typically assess only psychometric variables (e.g. attitudes, values, perception), are too detailed, or are oriented towards non-park facilities. Nonetheless, several criteria from these typologies are instructive. They include: the philosophy underpinning park design; land use histories; the function, location, size, level of governance, and range of the park, and the facilities located within the park, as well as park safety.²¹³ Three criteria stand out as most useful – size, facilities, and ‘naturalness’. These criteria could be used to develop a simple typology as illustrated in Table 1, below. It should be noted that we treat plazas as a distinctive type of urban open space, addressing them in a separate section of this report.

Table 1: A basic park typology

Type	Size (ha)	Typical Densities	Visit Length	Facilities	Naturalness	Image
Pocket park/ Playground/ Dog park	< 1	<50+ persons per ha	10 minutes – 1 hour	Few facilities – typically just play equipment and maybe benches	Few natural features – just a small grassed area with a few shade trees.	
Neighbourhood park	0.11 – 4.9	40 – 100+ persons per ha	30 mins – 1.5 hours	Limited number of sports facilities. Play equipment, picnic sites, BBQ facilities & green-space set aside for organised sport.	Larger areas of lawn, a field or two for organised sports and plantings of ornamental vegetation with shade trees. Some areas of impermeable surface.	
Community park	5 – 9.9	50 – 200+ persons per ha	30 minutes – 3 hours	Some active recreation or organised sports facilities. May include community centre.	Large areas of managed landscape, abundant lawn, shade trees and ornamental vegetation. Larger areas of impermeable surface.	
District park	10 - 24.9	50 – 1,000+ persons per ha	1 hour – 5 hours	Many sports facilities. Community centre, sports fields for football, soccer basketball courts, tennis courts etc.	Generous areas of managed landscape abundant lawn, shade trees and ornamental vegetation. Several grassed areas dedicated to organised sports. Several areas of impermeable surface.	
Regional park	25 – 500+	<150+ persons per ha	2 hours to 1 day	Range of facilities e.g. large scale recreational activities – field sports, archery, canoeing, nature trails etc.	Abundant natural features, mixture of managed landscapes and endemic vegetation. Much lower percentage of park is comprised of impermeable surfaces.	
Nature/ wilderness park/ National Park	25 – 1000+	<10 persons per ha	½ day to 1 week +	Few if any active recreation or organised sports facilities.	Few managed features and largely dedicated to preservation of endemic species. May include a landscape feature such as a wetland, hills or canyon(s). May contain interpretative signage.	

(Adapted from Baud-Bovy and Lawson²¹⁴)

Recognising the difficulties associated with classifying parks according to any sort of standard schema, and the further problem of trying to classify the variety of inner city greenspaces, we propose a more pragmatic approach. By combining the above-described criteria into an assessment tool, it would be relatively straightforward to assess various forms of greenspace and then classify them not based on ‘a priori’ definitions, but rather on their individual characteristics. Each greenspace within a study area would be scored according to the classes of attributes to be assessed (e.g. size, activities, condition etc.). Scores would be summed to generate an overall rating for each factor. These scores could then be illustrated on a spider or radar diagram, providing a ready comparison of park types and giving a much better overall assessment of the type and quality of each park or green space – as indicated in Figure 12 below. This approach was recently taken by Sister et al. in their extensive study of Los Angeles greenspaces and proved to be quite effective.²¹³

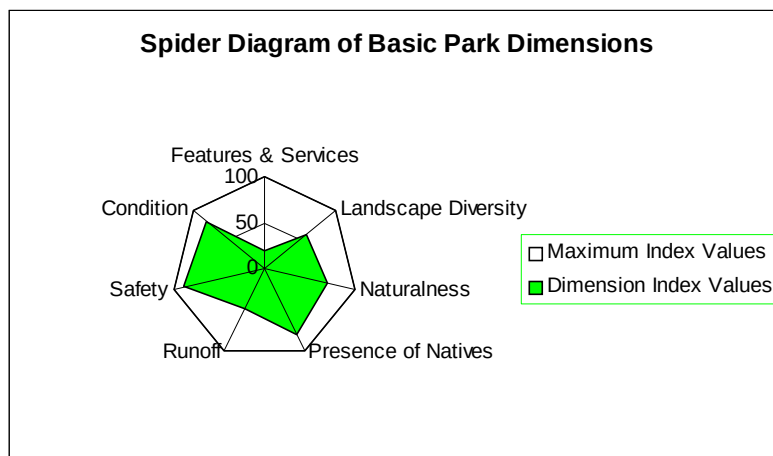


Figure 12: Spider diagram of potential indicators

Parks are not the only type of urban greenspace though. In most cities while parks comprise a large portion of green and open space, other types of urban greenspace and open spaces are present too including plazas, urban trails and even well-vegetated streets. We consider some of these in detail below. The above-described classification method should work equally well on these types of urban green/open spaces.

Plazas

The scholarly literature on urban consolidation and plazas is relatively limited when compared with parks. Few if any studies have investigated plazas in the context of urban densification.

Plazas are traditional open spaces in Chinese, Italian, Spanish and meso- and Latin-American cities – often acting as civic focal points. Typically they are paved spaces in between or completely surrounded by buildings, and function as meeting places.²¹⁵ Plazas often take the form of a public square – but their shapes can vary widely.²¹⁶ ‘Squares’, though similar to plazas, represent a sort of hybrid space between parks and plazas.²¹⁷ Like parks, there is no ‘archetypal’ plaza. Some plazas contain no vegetation whereas others are richly planted. Some have dirt bases whereas others are ornately paved. Some are intimate and cosy whereas others are massive and imposing. The most successful have evolved over time. As with all forms of open space, the activities that occur in plazas are often highly regulated, because conflicts can easily erupt over their appropriate use.²¹⁸ And design is of central importance as paved plazas without shade or trees can be unbearably hot in summer and bitterly cold in winter. Moreover, as public art is often incorporated into plazas they can become contested places – opinions will vary widely about the aesthetic appeal of sculptural or art objects.²¹⁹ More recently there has also been a trend for privately owned plazas – the courtyards or lobbies of corporate office buildings. Some scholars have criticised these spaces as exclusionary, lifeless and lacking imagination.²²⁰

Because plazas are most typically gathering places, their use is more transitory than parks.²²¹ Many plazas have been designed as ‘events spaces’ where large crowds can be accommodated.²²² Such spaces can easily feel lonely and alienating (see Figures 14 and 16). Given the temperature extremes that characterise many plazas, lack of shelter and few opportunities for sitting, plazas are often underutilised public spaces. Well-designed plazas though will overcome these limitations by encouraging people to linger, as shown in Figures 13 and 15 below.²²³

For example, plaza-design research by the Project for Public Places and Marcus et al., among others, shows that the best plazas will evoke a sense of place, are easily accessible, provide a variety of nested or interconnected spaces – with intimate corners as well as large expanses, have a broad range of amenities including seating (e.g. steps, ledges, benches, chairs & tables), fountains, toilets, arbours, shady rest areas and the like, are flexible spaces that can be used for a wide variety of activities, are complemented by sympathetic commercial uses (e.g. cafes), and enhance the civic/public domain of libraries, museums and other such spaces — rather than being just ‘afterthoughts or embellishments.’^{215, 224}

Well-designed plazas can be used for ‘strolling, sitting, eating, and watching the world go by.’²¹⁵ They will encourage a variety of other activities such as reading, dancing, listening to music, people-watching, exercise and even informal street vending and farmer’s markets. The best plazas will also feature good access to winter sunshine, shade from the summer sun, shelter from wind and rain, generous greenery to rest the mind and will be interconnected with other plazas, parks and pedestrian streets by greenways, bicycle trails and walking paths.²¹⁵ An equally important consideration is that plazas should be designed with regard to adjacent land uses so that a: ‘mix of retail, entertainment and dining opportunities attract a steady stream of users to the space’.²¹⁵



Figure 13: Musicians enliven a downtown plaza in Copenhagen, Denmark



Figure 14: Austere oceanfront plaza, Weihai, China



Figure 15: Inviting spaces in Wu Shan municipal plaza, Hangzhou, China



Figure 16: Desolate art gallery plaza, Brisbane

A typology of plazas

From the above discussion we can see that plazas come in a wide variety of forms. Some scholars have attempted to categorise these public spaces into typologies according to criteria such as: size, function, location, visual complexity, ownership, ornamentation (e.g. seating, sculpture & water features), uses/activities, and degree of vegetation.²¹⁵ For example Marcus et al. have identified pedestrian malls/street plazas, corporate foyers, urban oases, transit plazas and grand civic squares/plazas as encompassing the range of such spaces. What is required though, when considering how to ‘operationalise’ or put these ideas into action, is an understanding of: ‘people’s [actual] needs and desires in public settings’ (op. cit. p. 15). For the purpose of this report, it is not useful to arbitrarily categorise plazas within the inner 5 km of Brisbane into pre-existing schemas from elsewhere in the world, but rather to assess those spaces according to the guidelines we described in the previous section on parks, allowing for a better understanding of the plaza spaces that have already been created, their purpose, their size, features/attributes they contain and how they are articulated with/connected to other public spaces in the city. For instance, the public health/active living and urban ecology literatures tell us that for urban public spaces like parks and plazas to provide recreational, active living and biodiversity benefits, they must be interconnected with each other through linear corridors like urban trails/greenways.

Urban trails/greenways

Urban trails – also known as greenways – are linear corridors used for walking, cycling, jogging, skating (both in-line and skateboarding) and even horse-back riding.¹⁴⁴ Some trails are intentionally designed for this purpose whereas other have been converted from disused rail corridors or retrofitted to easements like power transmission corridors. Trails are usually paved, with surfaces of asphalt or concrete, but unpaved trails are common features in older built environments or on the rural-urban fringe (see Figures 17-20). Some nineteenth century back alleys for instance may be unpaved and may function as urban trails. Urban trails traverse varied landscapes including floodplains, river banks, lakefronts, woodlands and sea-sides. Trails also cross a wide range of land uses from industrial areas and vacant land to residential areas and nature reserves. Such trails are usually referred to as greenways where they have been constructed along abandoned railway lines or other ‘infrastructure corridors’, bikeways where they have been designed specifically for bicycle use or hiking trails where they have been designed for hikers and pass through more scenic landscapes.²²⁵⁻²²⁸

There have been a handful of studies of urban trails over the past decade all with a common emphasis on the recreational and aesthetic benefits of urban trails, and the challenges faced by planners in the design and maintenance of such trails. These studies have found that access to nature, exercising, commuting and relaxation are key motivations for trail use.^{226, 229-231} Recently there has been a discernable shift in emphasis towards a focus on the public health benefits of trails. Newer studies suggest that urban trails can increase the physical activity levels of residents, thus combating chronic diseases associated with sedentary lifestyles, especially where trails are connected to other greenspaces.^{142, 231-237} While there are few studies that have directly examined the role and function of trails in satisfying the demands of residents living in higher density built environments, there are broad findings from the urban trails literature of relevance here.²³⁸ These include a sex skew among trail users (males use trails more for active recreation like cycling than females who prefer strolling), an overwhelming preponderance of White, young to middle-aged, wealthy and well educated users on trails, and highly localised trail use.^{142, 143, 225, 226} Several studies have emphasised rapid distance decay – the steep decline in number of users visiting the trail as distance from the trail increases, finding that most users live within five kilometres of the trails they regularly visit.^{226, 235}

Studies have also found that a range of factors potentially affect trail use.^{144, 229, 239-241} Variations in trail use reflect weather events, changes to trail facilities and crime, with lower trail use following criminal activity or bad weather. Trail location, the surface of the trails, maintenance, the density

of adjoining vegetation, information about the trails, signage and user's perceptions of trail safety have all been found to affect how people use trails.^{226, 242, 243} Difficult road crossings, busy traffic, poor trailside facilities, unleashed dogs and potential conflict with other users may deter potential users.^{227, 231, 244}



Figure 17: White Rock Lake trail, Dallas



Figure 18: Lakefront Trail, Chicago



Figure 19: Park trail, Hangzhou, China



Figure 20: Shoreline trail, Sydney

Streets

Most cities have a hierarchy of street types ranging from small alleys to large expressways. Many of these streets could not be considered as green or open spaces as they are major traffic arteries. But some, like boulevards, lanes and pedestrian-only streets (malls) can perform functions other than acting as transport corridors. For example Copenhagen's 3.2 km long Strøget which was closed to traffic in 1962 is reputedly the longest pedestrian-only street in the world (see Figure 21) and is a cherished open space within that city.²⁴⁵ Similarly Curitiba's Rua XV de Novembro also known as flower street, is a pedestrian mall that was created by closing the street to traffic in 1972. It has since earned an international reputation as a fine civic space.²⁴⁶ Australia's capital cities have similar pedestrian malls including Perth's Hay Street Mall, Adelaide's Rundle Street Mall, Melbourne's Bourke Street Mall and Brisbane's Queen Street Mall, albeit much shorter in length. They function mostly as sites of passive recreation where people stroll, shop and watch other people.

But a problem with relying upon streets as public spaces, in lieu of parks, is that growing numbers of streets that serve entertainment, shopping or pedestrian functions have limited accessibility – they are only quasi-public spaces. Devices such as street furniture, surveillance cameras, security guards, concealed entrances etc. can function to limit the truly 'public' nature of these spaces, marking them instead as privatised spaces – spaces of exclusion rather than inclusion.²⁴⁷ A real danger in urban consolidation projects that create these types of spaces is that

the public domain will be eroded not enhanced, limiting the recreation and leisure options of residents – especially youth who may for example be ostracised for skateboarding in streets.^{248, 249}



(Source: <http://www.copenhagenet.dk>)

Figure 21: Copenhagen's Strøget – a public open space

For streets to work as effective public spaces, they need to be 'lively', safe and to foster social interactions.²⁵⁰⁻²⁵² Researchers have recently begun to rediscover the street as a public domain – they were once praised by urbanists like the late Jane Jacobs – and some studies have richly catalogued a range of activities that occur in streets and street margins (i.e. footpaths).²⁵³ These include playing games, shopping, reading, eating, sleeping, strolling, busking and various other behaviours.²⁵⁰ Design elements that foster social interaction in streets, thus making them effective public spaces, include: the presence of street trees; comfortable places to sit; wider footpaths to accommodate more pedestrians and activities like al fresco dining; buildings with sympathetic frontages such as alcoves or awnings that provide variety, shelter and shade; and other street furniture like bicycle racks and water fountains.^{250, 254, 255} In commercial streets shops with bright and interesting window displays can add vitality to streets and in residential streets porches, verandas and other semi-private building frontages can enhance feelings of security and promote greater social interaction.²⁵⁶

But the use of streets as open space should not be limited to footpaths or verges. Imagine a street painted to look like a rainforest canyon. The surface of the street would give the illusion of depth and volume, and treatments along the edges – including planter boxes, permeable pavements, vines on walls, and rainforest tree canopies – would complete the illusion. This is what could be done to select streets in consolidation projects within inner city Brisbane. Artist Edgar Mueller has shown that streets should not be limited to monotonous black asphalt, but instead can ignite the imagination and delight residents and visitors alike. His installation in Ireland for example (Figure 22) shows how an ordinary street can be made extraordinary.



(Source: <http://www.metanamorph.com>)

Figure 22: Edgar Mueller art installation, Dun Laoghaire, Ireland

While many of these ideas about effective public spaces may seem commonsense, examples of lively and inclusionary public spaces in urban consolidation projects are not widely documented in the relevant literature. Perhaps this is why planners have sought to codify good examples into ‘standards’, encouraging developers to replicate a model that is believed to work well. But standards can unintentionally stifle creativity and rule out flexible solutions. Such open space standards and their relative merits and failings are the subject of the next section of this report.

Synopsis

A wide variety of different types of open space make up the build environment of cities. In lower density cities these are predominantly comprised of parks and gardens. But as densities and land values increase, it can become difficult for civic leaders and urban managers to see the merits of acquiring large areas of expensive land for parks. Clearly this can be a problem, as any increase in the number of people in an area would logically increase the demand for access to urban green/open space. Civic leaders from earlier generations left a legacy of large beautiful parks in many cities (e.g. Kings Park in Perth, Golden Gate Park in San Francisco, Central Park, New York or Hyde Park, London) which make them liveable and sought-after places.¹⁸³ Smart leaders will follow their initiatives.

Yet park supply is only part of the equation. We also need to account for lifestyle preferences, recreation trends and socio-demographic characteristics when attempting to identify the level and type of open space required to satisfy any increase in park-demand due to higher densities. Are the newer residents predominantly childless couples or will families be moving into the higher density dwellings? How many older people will live in the area? Are there cultural differences that need to be accounted for? Many international migrants for instance are now coming from Asia where urban densities are higher, but where urban green/open spaces generally also have a higher level of landscape quality and more passive recreation facilities (e.g. mah-jong tables, tranquil gardens, plazas for social gatherings). What will their expectation be for green/open spaces in inner city Brisbane? We take up these themes in the next section.

For these reasons, many planners, urban land managers and civic leaders are turning to solutions based upon the supply of a diverse array of green/open spaces from small pocket parks, community gardens and street-corner plazas to larger civic plazas and iconic city parks, interconnected through a network of landscaped multiple use trails or ‘greenways’. There are several important lessons offered by the literature on urban green/open space and density when planning for the future needs of inner city Brisbane:

1. Provide versatile spaces that can be adapted for future needs – do not let design strangle a space;
2. Be generous in the provision of green space as it bolsters mental health and physical activity levels while also providing a range of ‘free’ ecosystem services (e.g. cooling heat islands, sequestering carbon, reducing pollution, intercepting stormwater). Land values are also significantly higher around urban greenspaces – thus improving municipal revenue;
3. Ensure that green/open spaces offer a range of informal services and programmed activities e.g. dance lessons or programmed sports events as well as weekend markets, food vending, or informal recreation such as tai chi groups;
4. Allow for smaller intimate spaces such as plazas and courtyards where people can gather to watch other people, read a book, eat lunch or just watch the world go by;
5. Require developers to locate commercial activities (e.g. shops with bright and interesting window displays, bookstores or cafes) next to green/open spaces as they can add vitality, excitement and safety to such spaces;
6. Make sure that urban green/open spaces: are easily accessible; provide intimate corners as well as large expanses; have a broad range of amenities (e.g. seating, fountains, toilets and the like); offer access to winter sunshine, shade from summer heat and shelter from the high winds; are flexible spaces that can be used for a wide variety of activities; are complemented by sympathetic commercial uses (e.g. cafes);
7. Design for new types of spaces such as green roofs, green walls, skateboard parks and community gardens;
8. Interconnect green/open spaces via pedestrian pathways and/or multiple use trails (e.g. cycling, walking, roller-blading etc).

Planning standards

Parks and other types of greenspace can play a valuable role in sustainable development. It is therefore useful to consider how planners have traditionally planned for parks and open space. Typically, a certain amount of open space is required in any development, based on longstanding assumptions about park use. Oftentimes this required amount of green or open space is calculated according to formulas enshrined as a ‘standard’ in planning legislation and/or policies. The ‘standards approach’ has conventionally provided certainty in greenspace planning. One set of rules are applied uniformly to all situations. But research has shown that many local authorities facing development pressure fail to implement their ‘standards’.^{17, 183, 257} A newer ‘needs-assessment’ approach recognises that different people have widely varying ‘needs’ for access to urban greenspace and that innovative solutions can satisfy these requirements.²⁴

Standards vs. needs

The standards approach for parks and open space provision dates back to the early twentieth century when park reformers sought to establish minimum acceptable park allocations for urban residents.^{102, 258} For example, the firm of Olmstead, Bartholomew and Associates – responsible for designing many early American parks - specified that no resident should be further than ¼ mile (400 metres) from a park (op. cit.). And early legislation in Massachusetts for instance, established a minimum of 1 playground per 20,000 residents (op. cit.). These ideas were modified

over time, eventually being enshrined in US national standards by the National Recreation and Park Association (NRPA) in the early 1970s.^{259, 260} The NRPA standards prescribed a park allocation of 10 acres (4 ha) per 1,000 residents, with variations by park size and political/administrative jurisdiction (see Table 2).²⁶¹

Similar trends occurred in the United Kingdom. In the 1920s a standard of 6 acres (2.4 ha) per 1,000 residents was adopted by the National Playing Fields Association and not long after the Second World War, a national standard emerged of four acres of open space per 1,000 residents, with no resident living more than a half-mile from a park.^{262, 263}

Australia appears to have followed a comparable trajectory to the United Kingdom. In Australia a national standard of 7 acres (3 ha) per 1,000 residents emerged in the 1940s.^{263, 264} Some Australian states have also implemented spatial standards whereby a proportion of the developable area (typically 10%) is expected to be provided for parks and recreation.^{265, 266} In Queensland, there is a generally accepted standard of 4 – 5 ha per 1,000 residents, and on the Gold Coast, a desired standard of service policy requires between 3.7 and 5.1 ha per 1,000 residents.^{264, 267}

Table 2: Comparison of international and Australian park standards

Place	Year	Size	Population	Distance
United States	1970s	10 acres/ 4 ha	1,000 residents	¼ mile/400 metres
United Kingdom	1920s	6 acres/2.4 ha	1,000 residents	unspecified
United Kingdom	1950s	4 acres/1.6 ha	1,000 residents	½ mile/800 metres
Australia	1940s	7 acres/3 ha	1,000 residents	unspecified
Western Australia	1955	10% subdivision	n/a	unspecified
Queensland	present	4-5 ha	1,000 residents	unspecified

From 1970s though, the parks standards approach has received increasing criticism for failing to deliver quality parks and open space, and for producing bland green-spaces that people do not use.²⁶⁸ Studies have also found that recommended park service areas (catchments) were beyond many people's typical walking distance.²⁶⁹ Some scholars have castigated planners for blindly applying park standards that failed to account for changing demographic patterns, changes in leisure preferences and behaviours, and which ignored the capabilities of older and younger people.²⁵⁸ Many of these standards have never been empirically evaluated or 'scientifically' tested.²⁵⁸ Where standards have been scrutinised, they have been found to be problematic. For instance, recent studies of United States municipalities found that local authorities have seldom achieved the standards articulated in their planning instruments; many are unable to provide parks even within a mile (1.6 km) of most residents.²⁵⁷ Other commentators have criticised the boring park landscapes that a standards approach produces.^{35, 262, 270} And public health researchers have recently argued that the whole notion of 'walking distance' to parks and other greenspaces that most standards are based on is spurious. Many people may not be able to accurately judge how far their home is from a park and even the ¼ mile (400 metre) standard may be beyond the time, physical or motivational capabilities of most residents.^{47, 257, 271} It is therefore reasonable to conclude that a standards approach poorly serves park and greenspace users.

As we noted earlier, in denser inner-city environments, populations are seldom homogeneous. Given the diversity of these areas, a number of factors must be considered when seeking to meet the needs of higher density residents for access to urban greenspace. A 'needs-based' assessment has emerged as the preferred technique for forecasting and supplying urban greenspace. Such an approach necessarily considers the characteristics of a given population, forecasts population

change based on socio-demographic surveys and focus groups, and then estimates the likely greenspace requirements for that population. We discuss a needs-based assessment in more detail shortly. But first, planners must better understand the various factors that influence how people use green and open space.

Factors affecting park and green/open space use

Open space use is closely associated with the pool of potential users – that is, the people who live within a specific community who would normally want or need to access and use urban green and open spaces.⁴⁷ But not all potential users will be the same; they will vary from each other by age, sex, race, ethnicity, education, income levels, disability, physical fitness, home ownership, and household composition.^{33, 123, 272, 273} And green/open space use is also closely associated with the physical characteristics of parks, playgrounds, plazas etc. and the neighbourhoods within which these spaces are situated.^{31, 124, 274} Spaces that are larger and contain more facilities – especially paved trails and wooded areas – will likely be used more often.^{275, 276} Preferences for different recreational activities will also influence how far a person travels to access a particular type of green/open space.¹³⁹ Even a cursory examination of the literature shows how some of these differences can profoundly influence how different people use parks and other types of greenspace.

Safety

Many studies of how women perceive and use park spaces, have found that women feel less safe in parks than men, perceive parks as spaces of potential danger, and feel that parks do not properly provide for women's needs.^{277, 278} The location of toilets, pathways, lighting, car-parking, children's play areas, signage, and park security may all impact how women and children perceive and use park spaces.^{63, 279-284}

Cultural differences

Because how we perceive a place is shaped by both individual differences and cultural values - people from diverse socio-cultural and socio-demographic backgrounds will likely perceive and use the same park space very differently.^{59, 285-291} Most Australian cities exhibit relatively high levels of cultural diversity, and studies of Australian parks have found that people from different cultural backgrounds use parks in ways that may be different to those of Anglo-Celtic Australians. Some Muslim people for instance, may use parks for religious festivities; some Vietnamese and Arabic Australians are known to socialise in park spaces in the evening, some Australians from Asian backgrounds have been found to practice subsistence fishing in parks, and some Macedonian-Australians are known to enjoy singing, drinking and dancing in parks.²⁹²⁻²⁹⁴ Immigrants bring with them a range of new demands upon open/green spaces.

Aesthetics

Research into greenspace aesthetics and values also tells us that greenspace users express differing preferences for features like varied terrain and topography, water, diverse vegetation and the presence or absence of tree cover.^{38, 63, 295, 296} Studies have found that many greenspace users place an equally high value on natural landscapes and settings and recreational opportunities.²⁹⁷⁻²⁹⁹ And some people may not even need direct access to parks to benefit from their presence. Just looking out onto greenspace may help people better recover from mental and physical trauma and enjoy more stable domestic environments.^{171, 173, 190, 300-302}

Time, transport, attitudes, preferences & ability

Other factors also potentially influence how and why people will use parks and other forms of greenspace. These include: where potential users live; whether they have access to public transportation; the amount of time people have for recreation; their attitudes towards nature; and

their leisure preferences.^{40, 47, 58, 59, 296, 303, 304} Many of these variables may in turn affect how potential users perceive particular greenspaces and whether they will use those spaces e.g. whether or not a park accommodates people with disability or whether urban trails are safe, welcoming, or threatening.^{145, 272, 305} Researchers have shown that some constraints consistently limit greenspace use including limited time, family responsibilities, fear of crime, poor information about available park spaces, illness, distance to parks, crowding, cost and poor access to public transportation.^{144, 306, 307} Any assessment of the needs of a particular community for access to urban greenspace should therefore attempt to 'factor in' as many of the aforementioned variables as possible. As we stated previously, a 'one size fits all' approach to providing urban greenspaces is unlikely work.

Needs-based assessments

The alternative to a standards approach is a 'needs based' assessment, which considers the socio-demographic and bio-physical characteristics of areas for which parks are needed, or where park facilities will be upgraded. There are several underlying assumptions to a needs-based assessment. First, needs assessment is driven by the idea that the population for whom a greenspace is planned should be calculated according to need.^{308, 309} Second, needs-assessment assumes that the spatial distribution of both populations and resources within a given area will be uneven.^{33, 309-313} Third, needs-assessment assumes that people will minimise travel costs (e.g. time, fuel costs, energy) by using the closest available resource.^{39, 46, 257, 271, 314, 315}

A needs based approach considers not only the absolute number of people within a given geographic area, but importantly also accounts for their socio-demographic composition, their leisure and recreation preferences and those of various sub-groups within this population, and the type and number of facilities required to serve those needs. These considerations should also reflect projected residential densities, which can change population compositions. Such a needs-based assessment is necessarily based on analysis of census data and where possible, on detailed community surveys, participant observation, focus group research, ethnographic data, and detailed assessments of existing parks to determine likely demand for - and rates of participation in - certain activities.³¹⁶⁻³¹⁸

While considerably more time consuming and resource intensive than a standards approach, a needs-based assessment may provide the capability to better estimate the amount of open space required, the design of that space, and the facilities and programs that foster recreation within that space. This is especially important for areas where density increases are planned, but where there is little or no opportunity for additional greenspace – either because there are insufficient funds available to purchase new parks, because relevant agencies have other priorities, or because there is simply no land available for new parks (excluding compulsory acquisition and demolition of existing building stock – now a common practice in large Chinese cities). But a needs-based assessment must necessarily go beyond the needs of existing residents to also forecast those of future residents – a difficult task.³¹⁹⁻³²¹ This necessitates a very good understanding of the likely demographics that new built environments will foster. As we have mentioned earlier, consolidation can have some unexpected and perverse impacts – greater numbers of transient residents (renters), polarised demographics (younger and older people) and conflicting recreation demands.⁴ It is beyond the scope of this paper to evaluate the various techniques for forecasting greenspace use, but there are several options available that merit closer attention.^{319, 320, 322-327}

Planners who undertake needs-based assessments invariably conclude that they require parks and greenspaces that are versatile and flexible in their design – capable of sustaining present trends but also future activities that may be beyond their capability to accurately forecast.^{41, 328-332} And the latest park planning trends suggest that we will continue to see more unconventional greenspaces and alternative uses of existing greenspaces. For example some foreshore parks of the Seine River in Paris have recently been converted into beaches for sunbathing – like the Southbank

Lagoon in Brisbane.³³³ Other examples include climbing walls, green walls, green roofs, fully contained parks, urban micro-pocket parks, densely planted medians/verges and greening streets via permeable pavements – trends we revisit later in the paper.³³⁴

Best practice in needs-based greenspace planning

An example of best practice in needs-based greenspace planning can be found in the Town of Mammoth Lakes, California Parks and Recreation Master Plan.³³⁵ Recognising the deficiencies of a standards approach, the consultants for the master plan developed a ‘tailored approach’ to park and recreation planning which recognised the needs of residents and sought to anticipate future recreation trends. The plan began by collecting socio-demographic information on the town’s residents and mapping the existing recreation and green space facilities. Next all the greenspaces and recreational facilities were inventoried and assessed through site inspections. These included parks, playgrounds, public pools, tennis courts, recreational watercourses, multiple use trails, shopping malls and the town plaza. Then a series of public meetings were conducted with residents to discuss their use of facilities, deficiencies in the existing greenspace and future needs. The consultants then distributed a ‘parks and recreation needs assessment survey’ to residents and analysed the results. From the meetings and survey a draft master plan was prepared with recommendations for maintaining and enhancing existing facilities and for acquiring new facilities/greenspaces. A suggested implementation strategy accompanied the plan. Finally the draft plans were released for public comment and revised according to feedback received from submissions. Importantly, part of the facilities assessment sought to ascertain the maximum range that residents were prepared to travel to use the various facilities in the study area.

We take up the latest directions in best planning practice in the next section of the report, where we review techniques similar to those used for Mammoth Lakes, but we also explore cutting edge methods that have been developed over the past few years.

Synopsis

Park standards were introduced by early park and open space planners to ensure a level of consistency. With the advent of the recreation movement, standards were designed to provide a minimum level of service while limiting the expense of maintaining park and recreation assets. But recent research has shown us that park standards were not based upon empirical research (scientifically verifiable data) but rather the assumptions of the designers. Although these standards became enshrined in best practice and even legislation in some instances, they do not necessarily provide for the needs of residents. Scholars from the environmental health and built environment professions have recently revealed that people are not inclined to walk the distances that many standards advocate. Some people from diverse cultural backgrounds find that the spaces standards produce are boring and unappealing. And standards cannot respond to socio-demographic change in urban populations.

A needs-based assessment is better able to respond to the requirements of urban populations. By surveying the recreational and open-space needs of urban residents and identifying trends from census data, and combining the results with a detailed inventory of green/open space facilities, planners employing a needs-based approach can better meet the demands of higher density residents for green/open space access. A ‘one size fits all’ approach to providing urban green/open spaces is unlikely work.

Best planning practice in green/open space assessment

Given that standards-based approaches to providing parks are problematic, what techniques are best suited to address the need for parks and recreation facilities in any proposed transit-oriented development? Over the past decade, researchers in the United States have suggested that a

geographic information systems (GIS) analysis could better assess the diverse needs of potential park users by evaluating the socio-demographic composition of park catchments.^{213, 310-312} The idea is to examine whether or not residents within a particular locality have equitable access to parks and open space. Notions of equity pivot upon ideas of “fairness”. But the critical question is “fair for whom?”

Four conceptions of equity might be considered when developing a needs based GIS assessment technique: (i) equitable distribution – where all members of society receive the same benefits regardless of existing levels of need; (ii) compensatory equity where resources are redistributed to those most in need to ameliorate inequalities; (iii) demand distribution where the most vocal residents get the most resources; and (iv) market based distribution, where people who can afford to pay the most for a service get access to that service or resource. But compensatory equity would seem to have the most utility for planners.^{311, 312}

Essentially GIS enables the researcher to compare spatial relationships between resource distribution (e.g. the location of parks) and resource need (when people who most need parks actually live). Park accessibility can be measured on four parameters – (i) the gravity model where demand for parks falls off at a negative rate with increasing distance; (ii) minimizing travel cost; (iii) covering objectives – which establish a critical distance for service provision and; (iv) minimum distance - which seeks to minimise inequality by decreasing the distance people must travel to access parks and open space.^{311, 312}

For example, Sarah Nicholls drew upon Talen’s work in a 2001 study that used GIS to examine the distribution of public parks in Bryan, Texas.³¹⁰ Nicholls employed a compensatory or needs based assessment of greenspace, and was specifically interested in testing the application of the National Recreation and Park Association (NRPA) standard of 10 acres of open space per 1,000 residents. Nicholls identified those groups most in need of access to parks and open space as non-whites, lower income earners (approximated by those who rent as opposed to own their home, and those whose property or rental value is lower than average), youth, the elderly, and people who live in higher density areas and lack access to private greenspace. What Nicholls found was that park distribution in her study area was equitable, but access to parks was not. The reason for this was that barriers such as highways or a lack of safe footpaths and cycle-ways hampered people’s ability to access parks that were within reasonable walking distance.³¹⁰

In Los Angeles, Wolch, Wilson and Feherenbach analysed US census data and the distribution of local parks using a GIS. What they found was that socio-economically and socio-culturally marginalised and disadvantaged groups lacked access to urban parks and open space. This disparity was exacerbated by unequal allocation of new park funding within the city, because suburbs already having excellent park facilities continue to receive funding for new parks, whereas those areas with a dearth of greenspace received comparatively insubstantial park funding.⁸⁵

Most recently two studies published in 2009, based in Baltimore Maryland and Los Angeles, California, used GIS to undertake an equity mapping analysis of parks. Unlike the above described studies, these two investigations used Thiessen polygons to first define a service area for each park in the study area, and then analysed the parks according to ‘potential park congestion’ or ‘pressure’ in each park service area.^{48, 49} The purpose was to see if some greenspaces are used more intensively than others. This type of analysis could be used to further characterize greenspaces in inner Brisbane as it will provide an indicator of the ‘saturation level’ of park use. If parks are already at capacity, there will be a need to purchase or develop other greenspaces to provide sufficient recreational opportunities for residents.

Greenspace needs assessment in inner Brisbane

When considering the needs of residents insofar as access to open space is concerned, planners must take into account a number of variables. These variables should include the location of existing parks and recreation areas and socio-demographic factors that will shape the needs of residents (including available leisure time, age, gender, income, ethno/racial identity and the like). Although we touched on many of these factors in our review of the literature, we also need to consider the spatial distribution of green/open space in the study area and whether areas targeted for higher density will be capable of meeting the recreational needs of present and future residents.

Drawing upon the international research discussed in previous sections, we recommend that future research into green/open space provision in the inner 5km of Brisbane begin with an audit of park and open space facilities. It is important to find out what types of green/open space are present in the study area, to ascertain their size and condition and the types of facilities that are present within them (e.g. fountains, dog parks etc). We also recommend using a Geographic Information System (GIS) to characterise the socio-demographic and biophysical characteristics of the population residing within the study area. An important consideration is the distance people are prepared/capable of travelling to access various forms of greenspace.

Walking and cycling distance

To characterise the study area, future research should use national and international data on walking and cycling distances to best estimate the distance that residents may be prepared to travel to access green/open space. There are three possible travel distances (zones). The first is 400 metres, which represents the maximum distance that an adult who was physically unfit, older or not able bodied would be likely to cover in a 10 minute walk. The second zone is 800 metres and represents the maximum average distance that a fit or able-bodied adult could be expected to cover in a 10 minute walk. The final zone is 2.5 kilometres and represents the maximum average distance that a physically fit adult could be expected to cycle over the same time period.^{139, 310, 336}

Characterising greenspace in the study area

Using the typology we outlined earlier in this paper, future research should also characterise the types of green/open space within the study area and then identify the proportion of the different forms of green/open space that can be found with the three above-described zones.

Socio-demographic characteristics of the study area

Future research should also characterise the current socio-demographic character of the study area using the latest Australian Bureau of Statistics (ABS) census data. The key indicators for a needs-based assessment of the study area will include sex, age, income, ethnicity, education, occupation, country of origin and household composition. What is important here is not to simply paint a portrait of who lives within the study area, but rather to establish the 'need' of residents for accessing green/open space. Based on our review of the literature, the indicator variables should be: age (people aged less than 14 and over 55); sex; income (low-income earners); occupation (service-sector employees); ethnicity (non-White); education (high-school graduate or below); country of origin (overseas born); and household composition (single-parents). People falling within these categories will have the highest level of need. These variables may identify for example, people living in apartments with little or no private space, who are single parents, who are children or are retired, and who have low-education and income levels and who are recent immigrants – essentially those people who may have greater need for access to parks and recreational resources.³⁰⁹⁻³¹² But future research should also use these variables to build an index of green/open space-need, to allow spatial mapping to show the highest areas of need across the study area, compared to the types of green/open space available to residents.

This will enable planners who are contemplating consolidation to redress inequities and avoid compounding relative deprivation.

We want to note here that it is difficult to determine what the future needs of the locality will be (on the basis of planned urban consolidation) without knowing the type, scale, density etc. of envisaged future urban forms. Nonetheless, the literature offers some guidance in identifying the population numbers and socio-demographic composition of urban areas that have undergone consolidation/densification. If we are to assume that these patterns are generalisable, then we can expect future developments in inner-Brisbane to be higher density than many suburbs within the 5 km radius defined by this study. We can also expect a higher proportion of residents who are young professionals, retirees, and couples with one to two younger children, but also a rising number of recent immigrants with young families. Many of these people will be dependent upon public transportation. But these speculative comments will need to be tested against areas in Australia that have recently experienced urban consolidation (e.g. inner-Sydney) – a study that lies beyond the scope of this report. Nonetheless, an examination of some national and international case studies will illustrate how planners and land managers are beginning to grapple with the green/open space challenges posed by urban consolidation – a task we take up in the next section.

Synopsis

International studies have recently shown that a GIS-based assessment of green/open space assets can reveal areas where access is limited or where park assets are ‘over-subscribed’, and hence where action is required. Such an analysis requires two things: (1) a needs-based assessment of the users of green/open space; (2) an inventory of green/open space assets within the study area. The inventory of assets will identify the location of parks or other types of open space with relatively few facilities or in relatively poor condition. By comparing the location of these assets with areas of comparatively higher demand and higher need for access to green/open space we can identify parts of the built environment that require either more green/open space or improvements to existing facilities. We suggest that a needs-based assessment must focus upon urban populations with the following characteristics: people aged less than 14 and over 55; lower-income earners; service-sector employees; non-White and overseas-born people; high-school graduates or below and single-parents. By doing this it will be possible to build an index of vulnerability/need to inform future planning.

Australian case studies

The last two sections of this report consider some national and international examples of green and open space provision in higher density areas. We have selected national examples based upon our familiarity with these places and because they exemplify many of the issues we have raised in our review. They include: the East Perth redevelopment project; Darling Harbour, Sydney; Federation Square, Melbourne and Southbank in Brisbane.

East Perth, WA

The East Perth redevelopment project is an urban consolidation demonstration site constructed under the aegis of the Commonwealth Government’s Building Better Cities Program of the early 1990s. The Western Australian State Government created a land development agency – the East Perth Redevelopment Authority – to oversee the process of assembling ‘surplus’ government land such as rail yards and consolidating them into a 120ha developable site. The project was intended to demonstrate the feasibility and attractiveness of higher density inner city living to a then unconvinced private property development industry, and to remediate a polluted industrial site – an example of positive planning.³³⁷ From this perspective the project has been a resounding success. But the project has also been justly criticised for displacing many vulnerable residents

including Aboriginal people, migrants and the poor.^{14, 338} Although it has won national acclaim as an example of good urban consolidation, the project actually resulted in a net loss of available urban greenspace, a reduction in the amount of affordable housing and created a gentrification effect on surrounding properties. We list the project here not to suggest that it should be emulated in its entirety, as it has many flaws, but rather to highlight the way that designers have treated greenspace within the site.

Although Haig Park, a large urban park once at the heart of the district, was significantly reduced in area, the overall quality of greenspace in the East Perth redevelopment area has been significantly improved from its pre-development state. Claisebrook – a heavily contaminated waterway/drain was excavated and turned into a small harbour (see Figure 23). Public art was placed around the water body and sculptural and ornamental water features have drawn the river back into the city. Large stretches of couch grass have been replaced with native vegetation, canopy shade trees, paved walkways and plazas. The project resulted in the creation of both vibrant and intimate public spaces including terraces with cafes, al fresco dining precincts and sunny harbour-side walkways and grassy hillocks. The key lesson for the inner city Brisbane area is how public art, water-features and a wide variety of useable open spaces can increase the vitality and liveability of a higher density residential area.



Figure 23: East Perth redevelopment project

Darling Harbour, Sydney, NSW

Darling Harbour was created in the late 1980s as an inner city redevelopment project associated with Australia's bicentenary. As with East Perth, Darling Harbour was developed by a government statutory authority – the Darling Harbour Authority. The 50 hectare site bears many of the hallmarks of large scale waterfront urban renewal projects of the time, largely modelled on the Baltimore Inner Harbour project. They include a conference centre, exhibition centre, aquarium, shopping precincts, up-scale apartments etc.³³⁹ And like East Perth, the development has experienced some problems, among them criticism for its exclusionary planning practices and lack of attention to social equity.³⁴⁰

But there are elements of Darling Harbour that offer lessons for future urban consolidation in inner Brisbane: (1) the site takes advantage of otherwise deleterious conditions. For instance a long water feature acts as a sound barrier, attenuating noise from the Cahill Expressway (see Figure 24); (2) the site provides a range of green/open spaces from Chinese gardens through large plazas to secluded lawns with benches; (3) these multi-functional spaces encourage pedestrians to venture further to explore the open space environment. They enable a wide variety of uses, including both active and passive recreation, and foster intermingling and conviviality; (4) and like East Perth, many of these spaces draw water into the built environment. The water features shown in the photographs below provide a connection with the Sydney Harbour –

drawing pedestrians underneath a busy freeway – a link which would otherwise be lost. Perhaps one very real draw back though is the lack of shade trees.



Figure 24: Darling Harbour green and open spaces

Federation Square, Melbourne, VIC

Opened in 2002, Federation Square in Melbourne is not a project that was created as a component of an urban consolidation effort. Situated across the road from the central railway station and sited on the banks of the Yarra River, Federation Square is a popular destination for tourists and locals alike. It is not a square per se, but rather is a plaza. The site includes restaurants, beer gardens, art galleries, cafes, and a television station studio among other features. Though the development encountered some opposition prior to its official opening, it is now prized by many local residents.³⁴¹

Federation Square offers some useful lessons about how public plazas might be integrated into urban open spaces in areas undergoing densification – such as those in inner Brisbane: (1) the site is readily adaptable to events attracting large crowds but also includes a variety of more intimate spaces; (2) changes in grade, building materials and pavement materials and textures give the area visual appeal; (3) a wide variety of seating as well as shade trees mean that the plaza is well used by pedestrians and people-watchers. It attracts workers and shoppers for lunch-time outings and also casual passers-by; (4) residents of nearby higher density dwellings use the site for leisure and recreation activities; (5) Federation Square is highly accessible from public transportation, offers good visibility and passive surveillance and is a democratic space, having been constructed as a civic space not a corporate one. The scholarly literature on Federation Square though limited, is positive – and deservedly so (see Figure 25).



Figure 25: Federation Square, Melbourne

Southbank, Brisbane, QLD

Like the East Perth Project and Darling Harbour, Southbank has been rightly criticised for displacing residents and others who formerly used the space.³⁴² Created following the Brisbane Expo in 1988, its redevelopment was not open, participatory or inclusive – much the same as East Perth and Darling Harbour. Though and over a decade has passed since its construction some people still mourn the loss of their connection with this place. For example Southbank has been nominated for the Project for Public Spaces’ ‘hall of shame’ for displacing original residents, reducing the availability of low-cost housing, for its exclusionary practices – especially where security personnel move on so-called ‘undesirables’, and for being a tourist space rather than a local space.^{255, 343, 344} Much of the housing in the redevelopment areas adjoining the parkland is ‘high-end’ and affordable housing is virtually non-existent. Having said this, Southbank still has some very positive aspects that are worth considering when evaluating the green/open space options for inner-Brisbane.

First, the presence of a sandy beach in the middle of a city is intriguing. It is arguably the only permanent such ‘CBD beach’ in the world – recognizing that Paris has an annual event where the banks of the Seine are temporarily transformed into a beach of sorts.^{333, 345} The beach attracts both adults and children and celebrates Brisbane’s subtropical climate – though its corporate sponsorship is disappointing as it continues neoliberal practices of privatising public spaces. Southbank also features a beautiful bougainvillea arbour, and a long walking trail and riverside promenade that interconnect café strips with music stages, university campuses, art galleries and parks (see Figure 26). The site has excellent access to public transportation and in most places has good connectivity to the Brisbane River. The parklands and plazas offer users access to restaurants and a weekend market broadens the diversity of users. Shelter from the sun and rain is generally good, although some places could do much better. What Southbank does exceptionally well is offer a range of smaller spaces that invite exploration and make the site appear much larger than it really is. The diversity of spaces fosters walking and provides for a variety of active recreation activities – though pastimes like kicking a football or skateboarding are excluded thus reducing the utility of the site for local residents.



(Source: Daniel O’Hare, Bond University)

Figure 26: Southbank promenade and arbour, Brisbane

Synopsis

The lessons learned from these various projects tell us that what works best in planning for green and open spaces in higher density urban environments. Providing interconnected public spaces with high levels of amenity such as good seating, shade from summer sunshine and access to winter sun; trees, public art and high accessibility is crucial if green and open spaces are to meet the various needs of residents. Giving people the opportunity to mingle with others but also to find seclusion is also very important. All the above-described case studies have excellent

connections to the waterways that they border, bringing water into the city. Another important lesson they offer is that such green and open spaces must be inclusionary rather than excluding people or activities seen as inappropriate. They must celebrate the interplay of sight, sound, fragrances, textures and other sensory experiences that make public spaces memorable if they are to work. They must also be able to accommodate daily and seasonal variations in use and importantly, must be flexible in allowing people to use them in a wide variety of ways – thus promoting liveliness and sense of place.

But we can also learn much from international case-studies, and this is the purpose of the next section, where we review successful green/open spaces in Europe, the United States and Asia.

International case studies

Looking to cities outside Australia can provide us with useful insights into how best to incorporate green and open space into urban consolidation projects. Here we consider selected projects in the United States, Europe and Asia with which we are familiar. European and Asian cities are generally more compact than their Australian counterparts and space is thus a luxury. Many of these cities we showcase here feature innovative green and open spaces that take full advantage of every piece of spare space to seamlessly weave into the urban fabric opportunities for relaxing, exercising or just escaping the hustle and bustle of city life. Such spaces make city living pleasurable rather than bearable – they enhance everyday life and give higher density living attractiveness that we are yet to fully appreciate in Australia. The cities we examine are London, Amsterdam, Copenhagen, Paris, Malmö, Chicago, Los Angeles and Hangzhou. Each of these places offers lessons for planners considering how to provide green and open space in Brisbane urban consolidation projects, lessons that are too important to ignore. We acknowledge that the literature points to other examples such as False Creek in Vancouver, Canada; Inner City Portland, USA; and mid-town Houston, USA. We encourage readers to explore these and other examples for the lessons they may also offer.

Millennium Village, London

Stepping out from the North Greenwich Station in London, one emerges into an urban redevelopment site which includes the Greenwich Millennium Village – a mixed use, high density, environment-oriented, urban village on the Thames River. Already home to the O2 or former ‘Millennium Dome’ concert venue, and the David Beckham Soccer Academy, the site is being redeveloped to include extensive parklands. The Greenwich Peninsula Ecology Park protects a substantial pocket of urban nature. New parks will comprise a continuous shoreline system with extensive cycle-ways and boardwalks. A new yacht club provides boating enthusiasts with world-class facilities and a primary school has also been opened in the area. The new parklands are serviced by London’s Underground and by bus and ferry systems. Future development will include high density housing, cafés, shopping precincts and entertainment facilities. The precinct has emerged as a model transit-oriented development.³⁴⁶ Figure 27 below shows one of the new riverfront plazas with interesting public art – opposite an old armoury and a new boardwalk that runs from the high density housing along the river to the subway. The entire development shows how formerly blighted spaces can be reinvigorated and local ecologies restored.



Figure 27: Plaza and walking trail, Greenwich Ecology Park, London

Amsterdam, the Netherlands

Amsterdam exhibits many of the properties of green and public open spaces that we have attempted to articulate in this report. In many ways it is a model for what higher density housing should seek to achieve and it is not surprising that many scholars have cited it as an example of a sustainable city.^{32, 347} Amsterdam's streets are lively and filled with people enjoying watching other people, going about their shopping, having a coffee or lunch under tree canopies, or cycling to work. There are few cars on these streets. Bicycles are the dominant form of transportation. Tree canopies encase the streets, gently filtering out harsh sunlight and these green fingers reach out, connecting into plazas, parks and nature trails (see Figure 28). Public transportation is always just a short walk away. Even though the densities are considerably higher than Australian cities, one does not feel overcrowded – on the contrary. Streets are abuzz with exciting activities; on them one can experience the aromas of coffee and cooking food and the sounds of people enjoying life. Children have places to safely play, older people can watch the world go by without walking far from home and teens and young singles have plenty of intimate spaces to socialise or be alone. A good example of a successful public place is Westerpark.



Figure 28: Canal, green-street and street cafés, Amsterdam

Westerpark, Amsterdam

Westerpark is not Amsterdam's largest park, nor its most frequently visited. From an urban consolidation perspective though, what makes Westerpark unique is that an original 19th century neighbourhood park has been radically transformed.³⁴⁸ Following remediation, the former glassworks was developed as a 'culture park'. The new park runs alongside a major rail line, and is very close to the heart of the city.³⁴⁹ It is surrounded by medium to high density apartment buildings and contains both active and passive recreation elements. Park facilities include an art

house cinema, art gallery, two cafés/restaurants, theatre, and events stage among others. Some of these facilities are heritage listed former factories (see Figure 29).³⁵⁰ Perhaps the most impressive aspect of the park design is the use of flexible spaces that have been established as incubators for creative industries and entrepreneurs and which also promote and protect local ecologies.³⁵¹ The park is free and has become a treasured haven for residents and visitors alike. Skateboarders rub shoulders with artists; dog-walkers can enjoy a beer; older people can watch art-house movies; and young entrepreneurs can see a concert after work. We believe that this is the type of green and open space that new higher density developments in Brisbane should strive to achieve.



Figure 29: Canal-side restaurant and nature trail, Westerpark, Amsterdam

Copenhagen, Denmark

Known as a liveable city, internationally renowned design scholars have cited Copenhagen as a place to emulate, especially the quality of its public realm.²⁴⁵ Copenhagen features some excellent examples of green and open spaces that complement higher density living. The city contains a wide variety of parks, plazas, walking trails, cycle routes and green streets. The city has managed to strike a balance between hard-scaped civic spaces and relatively intact ecological spaces (see Figure 30). And like Amsterdam, many of these spaces are integrated into a wider open space network that is easily accessible by public transportation. While parts of Copenhagen are very dense by Australian standards, these civic spaces make higher density living an enjoyable way of life for many of the city's residents.



Figure 30: Inner city plaza and park, Copenhagen

Paris, France

Out of all the cities discussed in this section of the report, Paris is best known for its parks, plazas, boulevards and other civic spaces.^{352, 353} Indeed there are too many to discuss in detail

here. What we want to highlight though are the small green spaces in Paris. One does not have to venture far to stumble upon a sculpture, fountain or garden in the spaces between the city's buildings. And these small greenspaces delight residents and visitors lucky enough to venture upon them. As Figure 31 shows, street-side fountains and parks in church grounds really enhance the built environment of Paris, making the higher density living that characterises the city one of its selling points. Australian designers of green and open spaces in urban consolation projects would do well to study how Paris has benefitted from its greenspaces.



Figure 31: Street-side water-feature and church-ground buskers, Paris

Malmö, Sweden

Developed in 2001 as part of a Swedish housing exposition, the new oceanfront residential development in Malmö in Sweden provides some good examples of how green and open spaces can dramatically improve higher density living.³⁵⁴ Like Copenhagen – its nearby neighbour – this development in Malmö, known as the Bo, features a range of green and open spaces (see Figure 32). The development is reputedly one of the more sustainable developments in the region, showcasing wetlands that recycle grey-water and energy efficient buildings. The buildings closer to the ocean are taller as a design feature to shelter the landwards components of the development from bitter winter winds. But the development has been criticised for lacking affordable housing, for poor transit accessibility and for the very high costs of construction.³⁵⁴ The oceanfront plaza has become a popular meeting space for residents and visitors alike.



Figure 32: Ocean-front plaza and nearby ecology park, Malmö

Chicago, USA

The Lakefront Park fringes the shoreline of Lake Michigan in Chicago, providing the city with valuable transit-oriented greenspace. Comprised of a series of parks including Lincoln Park,

North Pond, South Pond, Loyola Park, Centennial Park, Millennium Park and Burnham Park among many others, this linear parkland is accessible via the Loop (downtown rail network) and bus services. The parkland boasts a range of facilities including museums, bird-watching areas, cafés, an outdoor cinema, sporting facilities, nature reserves and public art.³⁵⁵ Medium to higher density housing and a university campus adjoin the park (see Figure 33). The lakefront trail connects these disparate greenspaces and has become one of the most popular walking and cycling trails in the U.S.



Figure 33: Lakefront Trail and nearby apartments, Chicago

Los Angeles, USA

Los Angeles is among the most park-deprived cities in the United States. Inner city residents typically have limited access to greenspace. For every 1,000 residents less than the size of a suburban backyard is available as accessible park-land, a dismal situation given the concentration of marginalised and vulnerable people living within the inner-city.³⁵⁶ In recent years though Los Angeles has been undergoing a kind of parks renaissance, in conjunction with moves to increase inner city residential densities and to attract residents back into the urban core. Citizen initiated referendums have required that federal, state and local authorities – oftentimes working in partnership – acquire and develop land for new parks, plazas and greenspace in the park-deprived core.³⁵⁶ Park bonds have enabled authorities to raise revenue for this purpose. But land available for parks is somewhat scarce in this metropolis and authorities have been forced to turn to innovative initiatives to create more park-space.

Some parks have been created from former industrial or ‘brownfield’ sites. The Kenneth Hahn State Recreation Area atop the Baldwin Hills is an example. This park was once a functioning oilfield. The Taylor Yards – until recently a commercial rail yard – is another example. This brownfield in downtown Los Angeles is currently being developed by the State of California Parks Department in Partnership with the City of Los Angeles for a major new inner-city park. The State acquired 23.5 hectares in 2000 for US\$45 million and the eventual park is proposed to be around 40 hectares in area. The new park will recreate riparian habitat in the heart of this bustling metropolis, complete with playgrounds, outdoor classroom facilities, picnic facilities and potentially an amphitheatre.^{357, 358}

But new parks of this size are rare. Oftentimes opportunities for smaller sites can produce just as impressive results. The Augustus-Hawkins Nature Park in South Los Angeles is a good example. It shows how new types of green/open space can be created in park-deprived urban cores.

The Augustus Hawkins Nature Park

The Augustus-Hawkins nature park is a former brownfield site South Los Angeles. Located in the heart of an industrialised neighbourhood, the park provides a welcome respite for local

residents. The 3.4 hectare park was funded through California park bonds and cost US\$4.5 million.³⁵⁹ Built by the Santa Monica Mountains Conservancy and the Mountains Recreation and Conservation Authority, and designed by Berkeley landscape architect Randolph Hester, the park opened to the public on December 16, 2000.³⁶⁰ The park was later transferred to the City of Los Angeles in 2005.

What is interesting about this park is that it was created as an ‘urban nature park’. Workshops with local residents, who are predominantly lower income Latinos and African Americans, revealed that residents wanted a nature park – not another playing field or recreation facility.³⁵⁹⁻³⁶² The park was once a Los Angeles Department of Water and Power pipe-storage yard and substantial remediation was required to remove soil contaminants prior to park development. The park is now focused upon a constructed wetland, and is densely landscaped with native vegetation. When it first opened the park was even staffed by a park ranger.³⁶³

The Augustus Hawkins Park presently features a spacious Craftsman-style community centre with after-school nature education programs for children as well as picnic areas, gardening boxes, toilets, water fountains and other amenities (Figure 34). Prior to being taken over by the City of Los Angeles the park also functioned as an ‘urban trailhead’ for the Santa Monica Mountains National Recreation Area. Every weekend busses took urban residents out to the mountains so that they could experience the coastal sagescrub environment that had been recreated in the park.^{359, 360} The park is treasured by local residents and the fact that its ornately decorated iron and stone fences and generous facilities have not been vandalised speaks to the importance of this recreational asset.³⁶² Even local gangs enforce a truce within the park grounds, and the park is widely heralded as a success story for improving the conviviality of surrounding areas.³⁶⁴ The lessons for Brisbane are that even in areas where acquiring land for parks seems impossible, beautiful urban greenspaces can be created and they need not be expensive to be successful. Park designers would do well to abandon assumptions about what is needed and instead talk with residents about what they want. Well designed parks in the right places can transform bleak landscapes into urban oases.



Figure 34: Augustus Hawkins Nature Park, Los Angeles

Hangzhou, China

Within China, Hangzhou is renowned for its beautiful parks, manicured gardens, forested hillsides, ancient temples and unparalleled urban landscaping. Marco Polo reputedly described it as ‘the most beautiful city in the world’. The Chinese Central Government has recognised Hangzhou as a ‘top tourism city’. Until recently though, the urban canals of Hangzhou were not on the list of the city’s environmental assets. For many years they were dilapidated and sometimes filled with household trash, rank water and building rubble. But now, Hangzhou is a city in the midst of a green transformation. The China Sports Lottery has provided a vehicle for

ecological restoration and social revitalisation. Many canals are now fringed by world-class parklands, landscaped gardens and physical fitness trails with a range of exercise equipment. And most of these parklands are within walking distance of high density urban villages, railway stations, bus-lines and electric trolleys. These ubiquitous public transport linkages will soon be joined by a modern subway system – six lines are presently under construction.

Complementing the canal parks are new types of urban greenspace including China's first urban wetlands park - the Xi Xi wetlands, and a new agricultural park, which provide city-dwellers with access to their bucolic past. Many of these new parks include a range of active and passive recreation areas, tea-houses, restaurants, heritage facilities, interpretative materials and sites for cultural festivals.

But what makes Hangzhou commendable from an urban consolidation perspective is the massive urban greening program that is underway – retrofitting greenspace to the city's dense urban fabric. Covering some 6,083km² and having a population of around 6 million, Hangzhou is a dense city. Almost the entire population resides in low to high rise apartment buildings and within the city limits virtually all the available space has been built over. But the municipal government has been greening every available space. Land next to canals, railway lines, freeways, factories and even city streets has been turned into flowerbeds, ornate gardens and immaculately landscaped parks. And stepping just several metres off any of the city's busy streets into one of these greenspaces, one immediately notices the tranquillity of this new 'urban green'. The city's residents cherish these spaces and use them from dawn until dusk for exercise, relaxation, socialising and even for impromptu farmer's markets (see Figures 35-40). Australian cities could learn much from Hangzhou, especially the way that greenspaces can be interwoven into just about any left-over urban space. Without these green jewels Hangzhou would be a desolate place. Thankfully the city's administrators have instead made it the envy of many Chinese.



Figure 35: Rail-side park farmer's market

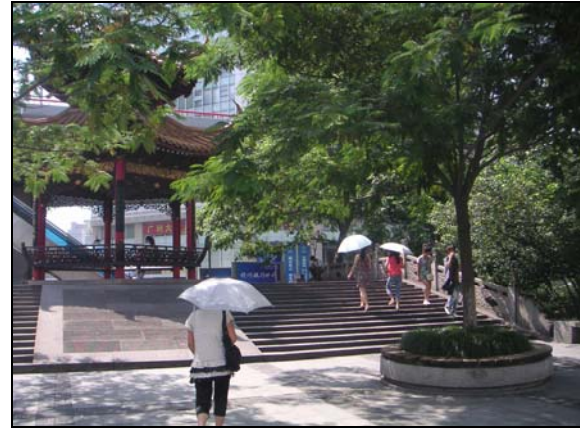


Figure 36: Green street-corner plaza



Figure 37: Canal-side parks & housing



Figure 38: Canal-side walking trail



Figure 39: Park adjacent freeway



Figure 40: Green streetscape

Synopsis

Looking outside Australia to international examples of successful green and open spaces reveals some surprising strategies to incorporate opportunities for recreation, leisure, entertainment, social interaction and access to nature. In Hangzhou, Paris and Amsterdam – where space is at a premium, green and open space designers have cleverly blended greenspaces and beautifully designed civic areas into the most mundane of spaces. Street verges, freeway margins, leftover industrial land and once-neglected spaces like railway easements have become gardens, sculpture parks, plazas, terraces, walking trails and parkland. Moreover, many of these spaces are interconnected, so that greenery and opportunities for social interaction permeate urban life, rather than being relegated to designated areas for a privileged few. The result is that these cities contain very democratic and widespread civic and natural spaces that considerably enhance the everyday lives of higher density residents. We would do well to learn from them.

Conclusion

This report, commissioned by Queensland's Department of Infrastructure and Planning, has examined how green and open spaces like parks, plazas, recreational trails, boulevards and other such amenities might be better integrated into higher density built environments that are created through urban consolidation. Urban consolidation in Australia, the report has noted, has a poor track record when it comes to the provision of parks and open space. This is partly because municipalities and government agencies have struggled to meet planning standards for park provision. Arguably, such standards do not provide the types of green/open spaces that higher density residents need. By carefully auditing existing greenspaces and surveying the needs of residents, for instance using focus groups and survey research as part of a comprehensive needs assessment, we might better provide for parks and open space in higher density built environments.

Incorporating green and open space into higher density built environments makes sense for many reasons. The academic literature points numerous benefits that green and open space provides – which span economic, social and environmental dimensions. Green and open space can make residents healthier, less stressed, happier and more convivial. Such spaces can reduce many of the costs associated with maintaining urban infrastructure by lessening flooding, suppressing dust, cooling hot areas and reducing wind-speeds and storm damage. And bringing greenspace back into urban areas also bolsters urban habitats, increasing biodiversity and enhancing ecological connectivity.

It is telling that research on transit-oriented development (TOD) in the United States – a form of urban consolidation – has revealed that the primary driver of residents' satisfaction with built environments is access to high quality parks and open space.^{365, 366} Bernick and Cervero for instance have found in their TOD research that most "...people preferred tightly spaced two-and-a-half-storey row [terrace] houses with modest backyards, located near a public park" (Bernick and Cervero (1997: 147).³⁶⁷ Yet such spaces have more often than not been an afterthought or secondary consideration in urban consolidation planning.

Looking to examples from Australia and internationally, we can see that planners can do much better than they have done in previous urban consolidation projects. Providing green and open space is not expensive – it may actually save money. Carefully designed green and open spaces can even make money for municipalities by fostering tourism, attracting residents to invest in their communities and bolstering the standard of living in higher density built environments. The challenge is to get past short term thinking and to see the bigger picture. Brisbane is well situated to learn from national and international lessons and what remains is for the city to take up the challenge of providing adequate green/open space in higher density developments, and perhaps become a national leader in this field. With political will and planning vision much is possible.

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Appendices

Appendix 1: Databases consulted and search terms

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Search Term(s)	Databases	Results
Subtropical urban design	CSA	7
Subtropical design	Illumina (CSA) Informit Proquest Geobase Current contents SSCI	159 42 82 0 152 0
Greenspace	CSA Ingenta Connect OVID	2 46 560
Subtropical urban design (SUD) & parks	Google Scholar Geobase	9,540 0
SUD & greenspace	Google Scholar	7,500
SUD & walls	Google Scholar	1,360
SUD & streets	Google Scholar Geobase	2,380 1
SUD & open space	Google Scholar Geobase	2,930 5
Subtropical design and greenspace	Current Contents	0
Subtropical parks	Geobase	9

Note, many articles were sourced from an existing extensive reference library (over 500 articles, books and book chapters) on parks, open space, physical activity, health, urban design, urban greenspace, urban trails and urban forests.

The method was to search key terms through a variety of databases until the relevant articles had been exhausted (i.e. reappeared in multiple databases). Google Scholar yielded far too many references. Only recent articles were searched (2004 and later) and the search was terminated after scanning the first 200 articles for each keyword.

Appendix 2: List of primary journals consulted

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- American Journal of Health Promotion
- American Journal of Preventative Medicine
- Annals of the Association of American Geographers
- Antipode
- Australian Geographer
- Australian Parks & Recreation
- Australian Planner
- Building and Environment
- Built Environment
- Children's Geographies
- Children Youth and Environments
- Capitalism Nature Socialism
- Cities
- Ecological Economics
- Energy and Buildings
- Environment
- Environment and Behaviour
- Environment and Planning A, B & D
- Environmental Conservation
- Gender, Place and Culture
- Geografiska Annaler B
- GeoForum
- Geographical Research
- Geo Journal
- Health and Place
- International Journal of Climatology
- International Journal of Urban and Regional Research
- Journal of the American Planning Association
- Journal of Environmental Planning and Management
- Journal of Green Building
- Journal of Historical Geography
- Journal of Leisure Research
- Journal of Physical Activity and Health
- Journal of Planning Education and Research
- Journal of Planning History
- Journal of Urban Affairs
- Journal of Urban Design
- Landscape
- Landscape Architecture Magazine
- Landscape and Urban Planning
- Landscape Journal
- Landscape Research
- Leisure Sciences
- Local Environment
- Parks and Recreation

- Places
- Planning Practice and Research
- Progress in Human Geography
- Public Health
- Queensland Planner
- Social Science Quarterly
- The Professional Geographer
- Tijdschrift Voor Economische en Geografie Sociale
- Tourism Geographies
- Transactions of the Institute of British Geographers
- Transportation Research Part D
- Urban Affairs Review
- Urban Design International
- Urban Ecology
- Urban Forestry and Urban Greening
- Urban Geography
- Urban Policy and Research
- Urban Studies

* Denotes three or more articles sourced from the journal.



Urban Research Program
Griffith University
Brisbane, QLD 4111
www.griffith.edu.au/urp