Greening the West – a regional approach

Strategic Plan

greening the west

Contents

1 Acknowledgments

This strategic plan has been facilitated by the Greening the West Steering Committee, which is made up of an alliance of partners – City West Water; the councils of Brimbank, Hobsons Bay, Hume, Maribyrnong, Melbourne, Melton, Moonee Valley, Wyndham and Yarra; the Victorian Department of Health; the Victorian Department of Environment and Primary Industries; Melbourne Water; Western Water; Parks Victoria; Urban Development Institute of Australia; VicRoads; Western Melbourne Regional Development Australia Committee; and Yarraville on the Nose Community Group.

While Greening the West is focused on the six western metropolitan municipalities of Melbourne – Brimbank, Hobsons Bay, Maribyrnong, Melton, Moonee Valley and Wyndham – the cities of Hume, Melbourne and Yarra have joined the Greening the West Steering Committee as project mentors and supporters. Their support is a key strength of the Greening the West alliance. It is gratefully acknowledged.

The Greening the West Steering Committee would also like to acknowledge the ongoing support from the Growth Areas Authority, Committee for Wyndham, Victorian Department of Planning and Community Development, Environmental Protection Agency Victoria and Vic Health. The cooperation and knowledge transfer from research institutions, particularly Melbourne, Monash and Victoria universities, have also provided tremendous value to the steering committee and this strategic plan.

The Greening the West Steering Committee also acknowledges Water and Carbon Group for their contribution in compiling the research for this strategy.

2 Executive summary

Greening the West is an initiative that aims to deliver positive health and social outcomes and enhanced liveability for communities in the western suburbs of Melbourne. It is driven by a steering committee consisting of the following collaborative and committed partners:

The vision of Greening the West is ***"to enable sustainable, liveable, healthy communities through urban greening"***, and the steering committee seeks to realise this by taking a regional approach in fostering projects and activities that deliver increased vegetation and public use of quality green space. Adopting a regional rather than local approach will deliver elevated benefits such as enabling of cross-border projects and consolidation of resources to promote the benefits of green space. Indeed, the key strength of Greening the West is the commitment of the stakeholders and the belief that much can be achieved through cooperative efforts.

A core driver for Greening the West is improving community health. Victorian Department of Health data suggest that, from a health perspective, the people of the west are disadvantaged. The department recognises the provisioning of quality green space that allows for passive and active recreation as a critical strategy to tackle health conditions such as obesity, diabetes, heat stress and the deleterious effects of air pollution. Influencing planning outcomes, including the establishment of new housing developments, is therefore considered an important aspect of Greening the West.

In addition to enhancing and protecting community health, Greening the West will address the numerous other benefits offered by urban greening. These include:

- energy savings through natural temperature regulation;
- mitigation of the urban heat island (UHI) effect;
- provision of natural habitat and wildlife corridors; and
- enhancement of business activity.

Comprehensive data exists on vegetation cover, health status, demographics, socio-economic indicators and housing, all of which will assist in identifying priority sites where green space can deliver the most significant benefits. Having reviewed this data, the steering committee has developed the following eight key strategies for Greening the West:

Goals	Targets
1. Maximise urban greening	• Double tree canopy cover in the west by 2050 • Green space to be increased by 25% by 2030
2. Improve quality and functionality of green space	• Ensure quality and well-designed green open space for all communities
3. Increase the use and interaction of residents in green space	• All residents to have access to quality green space within 400 – 500 metres from their home • Enhance the range of facilities to maximise use and participation • Improve tree canopy cover to promote connectivity between urban places
4. Improve the health and social wellbeing of residents	• Improve the health indicators of the west
5. Showcase the economic and intrinsic value of urban green space	• Create a business case for each green space project
6. Improve environmental quality	• Create benchmark standards for stormwater quality, air quality, natural habitats and heat stress
7. Advocate green spaces to all levels of government and key stakeholders	• Annually showcase five Greening the West projects • Increase engagement and investment from stakeholders and government bodies • Lobby all levels of government and stakeholders to maximise greening outcomes • Each council to establish a tree protection overlay
8. Maximise sustainable water supplies to establish and maintain green space	• Identify opportunities for alternative irrigation of green space • 25% increase in supply of alternative water for green space by 2030

In order to reach these targets and harness the full potential of urban greening, project partners must acknowledge and overcome a number of challenges, including social disadvantage and limited financial resources as well as limited sites, poor soils and low rainfall. The strategic directions for Greening the West are therefore as follows:

1. Plan for community health and wellbeing
2. Advocate for policy and institutional change
3. Communicate, connect and educate
4. Promote collaboration and secure commitment

From a practical point of view, the single greatest challenge is perhaps sourcing water for irrigation, so the inclusion of the relevant water corporations (City West Water, Western Water and Melbourne Water) is integral to the success of Greening the West. It is an initiative that will further our knowledge and open up opportunities to better integrate planning for urban greening with alternative water projects.

3 Introduction

Greening the West is an initiative that aims to deliver positive health and social outcomes and enhanced liveability for communities in the western suburbs of Melbourne. It is driven by a steering committee consisting of the following collaborative and committed partners:

City West Water	Brimbank City Council	City of Melbourne
City of Melton	City of Moonee Valley	City of Yarra
Department of Environment and Primary Industries	Department of Health (Vic)	Hobsons Bay City Council
Hume City Council	Maribyrnong City Council	Melbourne Water
Parks Victoria	Regional Development Australia	Urban Development Institute of Australia
VicRoads	Western Water	Wyndham City Council
Yarraville on the Nose Community Group		

Figure 1: Local area map

Working across regional borders, Greening the West aims to realise the vision ***"to enable sustainable, liveable, healthy communities through urban greening"***. The broad term "urban greening" has been deliberately chosen in order to encompass all activities that promote or enhance the connection between people and vegetation in the urban environment. Greening the West is seeking to inspire the implementation of urban greening in all forms, from pot plants to rooftops, walls, nature strips, private backyards, car parks, sporting fields, streetscapes, waterways, parks, community gardens and nature reserves.

The focus of Greening the West is Melbourne's six western municipalities: Brimbank, Hobsons Bay, Maribyrnong, Melton, Moonee Valley and Wyndham (see Figure 1). Greening activities can involve the whole gamut of organisations and individuals in this region, including local government, businesses, schools and residents.

The purpose of this strategic plan is to provide advice and guidance to the above municipalities in making the decisions required to translate the vision of Greening the West into on-ground actions. Notably, the plan presents a sound case for a joint pursuit of the large-scale changes aspired to by the members of the steering committee.

It should further be noted that this document does not replace existing municipal strategies relating to open space. Rather, it is designed to reinforce the evidence base for investments in urban greening and identify opportunities to expand and complement the many exciting urban greening activities that are already underway.

Project background

In March 2011, City West Water facilitated a think tank to explore the opportunities for collaboration across the western region. More than 100 representatives from local government, government agencies, community groups and the water industry attended. A resounding outcome from the think tank was an express desire to form an alliance to support greater urban greening opportunities in the west. As a result, the Greening the West Steering Committee was formed in July 2011.

To date, the committee has initiated pilot projects within the west and facilitated the development of this strategic plan.

Policy drivers

The Greening the West initiative transcends a number of policy drivers, including preventative health, economic development, environment and planning, all of which are key elements to a sustainable city.

The following sections outline the relevant bodies, strategies and guiding documents that have been developed for national, state and local government policy that relate to urban greening and planning for sustainability. Each of the bodies and their supporting strategies are both the driver and the support for establishing the Greening the West initiative and provide regional links, planning and projects.

National drivers

The **Australian Federal Government** has developed *Our Cities, Our Future,* a national urban policy document for a productive, sustainable and liveable future. The policy articulates the role of the Australian Government in helping our cities work better, whether through direct investment or in partnership with other stakeholders.

The **Council of Australian Governments** (COAG) has produced *Creating Places for People*, an urban design protocol that outlines reforms in capital city planning "to ensure Australian cities are globally competitive, productive, sustainable, liveable and socially inclusive and are well placed to meet future challenges and growth".

The **Department of Health and Ageing** has launched the *Healthy Spaces & Places* project in collaboration with the **National Heart Foundation of Australia**, the **Australian Local Government Association** and the **Planning Institute of Australia**. It is a nationwide initiative that encourages the creation of places for healthy living.

State drivers

The **Government of Victoria** has recently published two strategic planning documents with a specific focus on harnessing the benefits of urban greening in planning processes:

The Parliamentary Inquiry into Environmental Design and Public Health (2012) mounted the case for integrating health and wellbeing goals into the Victorian planning system.

The **Office of Living Victoria** has written *Melbourne's Water Future*, which presents a whole-of-water-cycle solution. It takes an integrated approach not only to the delivery of a safe and plentiful water supply but also to the maintenance of parks and gardens, outlining several initiatives that complement Greening the West.

These include:

- a plan to keep existing green areas and trees thriving;
- encouraging and supporting the planting and maintenance of new trees;
- setting new goals for tree-canopy cover and soil moisture levels;
- ensuring that new developments and inner Melbourne suburbs include provision for water-efficient landscaping; and
- developing a Melbourne-wide program of "green neighbourhoods" to promote connectivity between urban places.

One of three metropolitan water corporations, **City West Water** provides conventional potable water, recycled water, sewerage and trade-waste services to residential and non-residential customers in Melbourne's central business district and inner and western suburbs. City West Water initiated Greening the West and has thus far supported its administration and development. A large proportion of City West Water's customer base is located within the western suburbs and its primary role in relation to Greening the West is to provide sustainable water solutions for urban greening projects and facilitate a coordinated approach.

In 2012, City West Water began work on its *Integrated Water Cycle Management Strategy*, which focuses on residential and non-residential water-servicing solutions, including the irrigation of public open space, with alternative water supplies. This strategy details servicing options for the urban growth corridor as well as existing suburbs.

Melbourne Water has key responsibilities to manage Melbourne's water supply catchments, waterways and major drainage systems in the Port Phillip and Westernport region. Melbourne Water developed its draft *Healthy Waterways Strategy* and *Stormwater Strategy* to guide the sustainable management of waterways and stormwater in Melbourne. The *Healthy Waterways Strategy* specifically looks at vegetation management, environmental flows, habitat enhancement and working with communities to achieve healthy waterways, whilst the *Stormwater Strategy* guides the protection and improvement of ecosystem health in waterways and bays, working to achieve multiple community outcomes, including liveability, alternative water supply and public health.

The *State Planning Scheme* has a large influence over urban design and green space, particularly for the urban growth areas, in the west of Melbourne represented by the councils of Melton and Wyndham. The **Growth Areas Authority** develops *Precinct Structure Plans* and *Growth Corridor Plans* to determine sustainable outcomes in these new residential areas.

The **Victorian Department of Transport Planning and Local Infrastructure** covers two bodies that are relevant to the implementation of the Greening the West plan: **VicRoads** and **Public Transport Victoria**. Both of these bodies own and manage a considerable amount of land connecting and traversing through the inner and outer suburbs of western Melbourne.

The **Department of Planning and Community Development** (DPCD) is developing its *Metropolitan Planning Strategy* to guide Melbourne's growth and change over the next 30-40 years. This strategy integrates transport and land-use planning and is being developed in close collaboration with planning and transport agencies, including VicRoads.

In 2008, the Victorian Department of Transport Planning and Local Infrastructure released its *Public Transport Guidelines for Land Use and Development*. Covering improvements to urban amenities, such as local accessibility and connectivity between communities, this is an information resource for councils, developers and consultants.

The *Regional Rail Link* is a landmark infrastructure project designed to remove major holdups in Victoria's rail network. Involving the construction of dedicated regional tracks from West Werribee Junction to Deer Park and along the existing rail corridor from Sunshine to Southern Cross Station, it represents significant opportunities for urban greening.

Local drivers

Local government is responsible for planning and managing the majority of public green open space areas (street trees, parks, streetscapes, etc.). Each council is required to have a *Council Plan, Public Health and Wellbeing Plan*, and *Local Planning Scheme* to guide decisions to ensure equitable outcomes for the community and environment. Beyond these policies, each council can develop a wide range of other strategies relating to urban greening. The goals and objectives of existing strategies of this kind align with many of the goals of Greening the West.

As a result of the impact of extended drought, growing community interest in environmental management and the increasingly obvious need to plan for population growth and climate change, local councils are today in a strong position for influencing urban planning. This is reflected in the new and evolving presence of integrated water cycle strategies, climate change strategies and urban forest strategies.

4 Key issues and opportunities

Urban greening encompasses all activities that enhance the quality and amount of vegetation in the urban environment. Such activities can be undertaken to address a wide range of issues, which for the purpose of this strategic plan will be grouped according to how they relate to the following broad fields:

1. **Health and wellbeing**
2. **Environment**
3. **Economy**

In exploring these fields further below, it should be noted that all greening activities result in multiple overlapping benefits regardless of what issues they were designed to address. The health issue of obesity can for example be addressed through the creation of more accessible and higher-quality public open green space that encourages a more active and healthy lifestyle whilst also yielding environmental and economical benefits by providing wildlife habitat and natural temperature regulation. For all the flow-on benefits of urban greening, the reader should however bear in mind that the express priority of Greening the West is the health and wellbeing of residents.

Health and wellbeing

Lifestyle-related disorders, heat stress, environment-related illness and mental illness pose a significant burden in Australia. The economic costs of this burden go beyond the immediate treatments of disorders, extending to loss of productivity, unemployment and insurance costs, and the social impacts are immeasurable.

As outlined in the following sections, greener urban environments can offer low-cost preventative strategies to improve community health, reduce heat stress, increase amenity and foster social cohesion.

Lifestyle-related disorders

Compared with past generations, we are increasingly geared toward sedentary behaviour. There has been an increase in inactive leisure activities such as playing video games and watching television (Biddle et al. 2004). Almost 60 per cent of Australians aged 15 and over do not do enough physical activity (as defined by the national guidelines of the Australian Institute of Health and Welfare, 2012) to benefit their health. The ramifications of this collective inertia are immense. Physical inactivity is responsible for an estimated 8,000 deaths per year in Australia and the total national cost of obesity, including health system costs, productivity declines and carers' costs, has been estimated at around $58 billion per year (Access Economics 2008). Research indicates that significant savings on these costs can be achieved through lifestyle interventions; for example, 11% of obesity cases could be successfully managed with treatments such as dieting, counselling and physical activity (Medibank Private 2010).

A Victorian Department of Health research paper (Roache et al. 2011) shows that green environments with attractive, accessible open space encourage greater levels of physical activity among residents. The paper concludes that "Municipalities showing high levels of obesity and type 2 diabetes should be encouraged to invest in appropriate green infrastructure to facilitate exercise as physical activity can reduce obesity and lifestyle-related diseases." A large-scale European study including nearly 7,000 subjects from eight countries supports this recommendation, stating that people with the greatest access to green space were 37 per cent less likely to be overweight or obese than those with the least access. They were also more than three times as likely to frequently engage in physical activity (Ellaway 2005).

A number of health statistics suggest that physical inactivity is of major concern in the project area. Table 1 highlights that residents in four of the six councils exceed the state average for inactivity. Most municipalities in the west also have levels of obesity and type 2 diabetes that are above the state average, with Melton having the highest levels of diabetes in Victoria.

The "Self-reported health" figures included in Table 1 are measures of perceived wellbeing and health, and these data shows that all areas in the west ranked below the Victorian average, with Brimbank being the worst and Melton the sixth worst in the state. Considering that the benchmark state average does not represent satisfactory levels of health and wellbeing either, this shows that there is a large minority of exceptionally vulnerable residents in these regions.

Table 1: Health data for Greening the West project area (cells shaded green denote outcomes above the state average and a rank of 1 represents the worst outcome in the state)

Municipality	Brimbank	Hobsons Bay	Maribyrnong	Melton	Mooney Valley	Wyndham	**Vic. Average**
People not meeting physical activity guidelines	31.3% RANK 6	30.8%	25.9%	29.2%	27.3%	28.7%	**27.4%**
People overweight or obese	52.2%	56.5%	44.2%	58.2% RANK 9	45%	52.5%	**48.6%**
People with type 2 diabetes	6.7% RANK 7	3.2%	5.5%	9.3% RANK 1	3.1%	4.3%	**4.8%**
People not eating recommended amounts of fruit and vegetables	43.4%	46.6%	52.3%	54.9% RANK 9	41%	57.1% RANK 4	**48.2%**
Self-reported health fair or poor	25.5% RANK 1	21.3%	19%	23.4% RANK 6	19%	20.1%	**18.3%**

Source: Department of Health Victoria 2013

Urban greening for active lifestyles

Improving the quantity and quality of urban green spaces within close proximity to residents can assist in promoting physical activity. Street trees with broad canopy cover offer shade and amenity that may encourage residents to utilise active means of transport. Well-serviced parks also provide opportunities for active and passive recreation. Both have multiple flow-on health benefits, including a reduction in obesity and an improvement in mental wellbeing.

As will be discussed further below, broader aspects of urban planning also have major implications for lifestyle-related illnesses. Low-density housing and its associated car dependency, vast distances between home and work, and poor access to green space are linked to behaviour patterns that contribute to poor physical and mental health (Butterworth 2011).

Heat-related illness

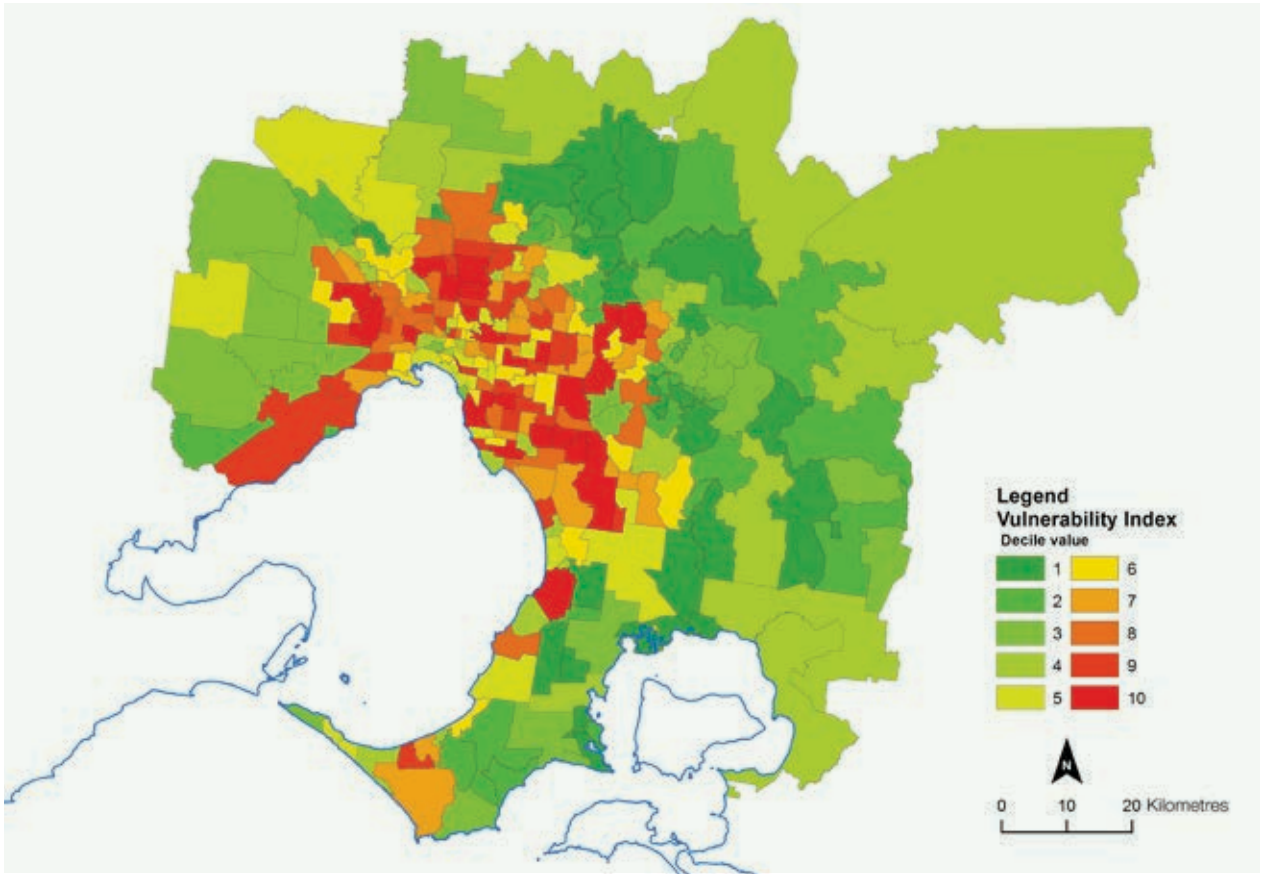
Heatwaves are responsible for more Australian deaths than any other natural disaster (PricewaterhouseCoopers 2011). The prevailing conditions in the week prior to the 2009 Black Saturday bushfires are a case in point, with temperatures then exceeding 43°C for three consecutive days. During this period, the state death rate rose from an average of 90 per day to more than 200 per day. The Victorian State Coroner reported 374 excess deaths during this time, and the incidence of similar heatwaves is forecast to increase in Victoria. Projections indicate that, barring significant global emission reductions, the annual number of days above 35°C is likely to increase from the nine days currently experienced in Melbourne to up to 21 days by 2070 (Garnaut Climate Change Review 2008).

Whilst such heatwaves can affect anybody, certain population groups are more at risk than others. The Monash University Hot Spots Project identified that the following key variables lead to increased impacts of high temperatures in an area:

- high proportions of very young (0-4) or elderly;
- high proportions of pre-existing health conditions;
- large numbers of aged-care facilities;
- demographics featuring low socioeconomic status;
- high-density housing;
- significant numbers of single persons aged 65+ living alone;
- high incidence of disability among residents;
- high-density population
- significant numbers of non-English-speaking residents; and
- sizeable urban heat island.

With many of these factors co-existing in the western suburbs, areas of particularly high risk are those in the inner west, northwest and southwest, as indicated by Figure 2.

Figure 2: Vulnerability to heat events index for municipalities of greater Melbourne



Source: Loughnan, M et al. 2013, p77

Compounding the impact of heatwaves is the increasing urbanisation of Melbourne, which creates large numbers of impervious surfaces in the form of buildings, roads and car parks. These impervious surfaces generate artificial warmth, so-called urban heat islands (UHI), resulting in Melbourne's urban areas having peak temperatures up to 7°C higher than their rural surroundings. It is a phenomenon that can rapidly lead to tangible health impacts; Monash University research has shown that maximum temperatures need only exceed 29°C for heat-related morbidity and anomalous health outcomes to increase in people over 64 years of age (Loughnan et al. 2013).

Cooling effects of urban greening

Vegetation can provide cooling through two main mechanisms: shading and evaporative cooling of the air. Whilst the benefits of shading are obvious, the value of evaporative cooling is not as widely known. It is achieved through evapotranspiration, the evaporation of water from within leaves. This is a very cost- and energy-efficient means of temperature regulation, and the microclimate surrounding plants can provide significant relief to people during heatwaves. However, for sufficient evapotranspiration to occur, plants need to receive enough water to ensure that they do not merely survive, but that they thrive. For this reason, irrigation is often necessary on hot days and during extended dry periods.

The cooling effects of different vegetation types is summarised in Table 2, which is an excerpt from a comprehensive guide released by the US Environmental Protection Agency.

Research conducted by Monash University for Greening the West supports the US findings, establishing that, on average, vegetated areas are 11°C cooler than the darkest non-vegetated areas.

The city of Shanghai offers further testament to the value of urban greening. In response to a devastating heatwave in 1998, urban green space was here expanded from 19.1 per cent to 35.2 per cent. Despite the city's "at-risk" population remaining constant, the number of deaths then declined in the 2003 heatwave, which was the hottest on record.

Table 2: Cooling benefits of urban greening

Function	Benefit
Shade from trees	Surface temperature reduction of 11-25°C for walls and rooftops
Vines on walls	Temperature reduction of 20°C
Trees shading parked cars	25°C cooler inside shaded car
Shade from small groups of trees	5°C cooler than open terrain
Suburban areas with mature trees	2-3°C cooler than new suburbs with no trees
Air temperatures over irrigated fields	3°C cooler than bare ground

Source: USA EPA 2008

Mental illness

Mental illness is Australia's leading cause of non-fatal illness. The national cost has been estimated at $20 billion per year, which includes the cost of lost productivity and labour force participation (Council of Australian Governments *National Action Plan on Mental Health 2006–2011*). Mental illness is also the largest contributor to the disability burden in Victoria, costing an estimated $5.4 billion a year through healthcare costs and associated impacts on workforce participation and productivity (Victorian Legislative Council 2012).

One in three Australians will suffer from depression or an anxiety disorder at some point in their lives. Such conditions can be extremely debilitating and impact on a sufferer's ability to engage with others, maintain steady employment and live a healthy, productive life (Victorian Legislative Council, Parliament of Victoria, 2012 Inquiry into Environmental Design and Public Health in Victoria).

A measure of mental health is the percentage of people reporting psychological distress, so-called self-reported psychological distress. As per the below table, the levels of self-reported psychological distress in Brimbank, Maribyrnong and Melton were above or well above the state average.

Table 3: Self-reported psychological distress occurrence in local government areas
(shaded cells denote outcomes above the state average and a rank of 1 represents the worst outcome in the state)

Municipality	Brimbank	Hobsons Bay	Maribyrnong	Melton	Mooney Valley	Wyndham	**Vic. average**
per cent people reporting high/very high psychological distress (ii)	16.7% RANK 3	10.9%	13.9%	15.5% RANK 9	10.3%	8.7%	**11.4%**

Source: Department of Health Victoria 2013

Urban greening for mental health

In a recent Western Australian study, it was reported that those living near moderate- or high-quality public open space were twice as likely to report low psychological distress as people in neighbourhoods containing only low-quality public open space. Indeed, as far as mental health is concerned, the quality of public open space appears to be more important than the quantity of public open space (Francis et al. 2012).

A 2010 Beyond Blue research report investigating the benefits of contact with nature for mental health and wellbeing described a range of psychological benefits for people who visit green, open spaces, including:

- improvements in mood;
- lower levels of anxiety;
- lower levels of stress;
- lower levels of depression; and
- increased physical activity.

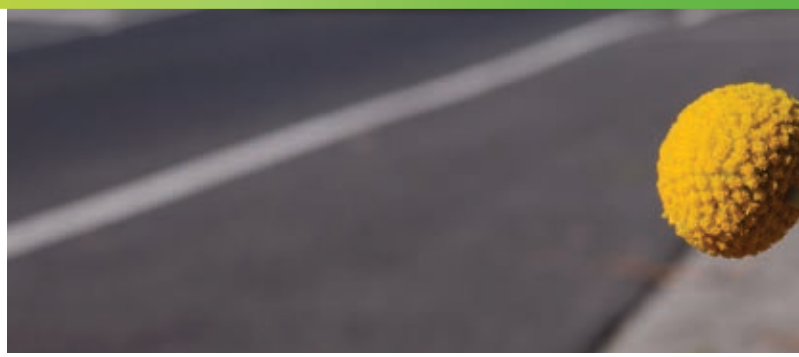
In this context, it should be pointed out that greener urban environments not only benefit the individual by enabling and encouraging activities such as the playing of sports, walking and cycling. They also open up for many of the interactions that build social cohesion within a community, for example involvement in “Friends of” groups, planting days and various public events. Overall, social interactions in green spaces tend to be relatively relaxed and friendly, creating a strong sense of place. This translates into the feelings of attachment and belonging that form the very foundations of society.

Environment-related disorders

Thanks to changes in car and manufacturing technology, air quality has improved noticeably over the past few decades. Diesel emissions are however increasingly prevalent in urban areas, and we are learning more and more about their impacts on health. These include multiple respiratory disorders, strokes, heart attacks, adverse birth outcomes, neurotoxicity and effects on the immune system. Since the western region of Melbourne, particularly Maribyrnong and Geelong, are at the epicentre of the expansion in international trade, this is of particular concern in the project area.

The Western Transport Alliance (2008) indicated that container trade through the Port of Melbourne will increase significantly in the future, with international container trade alone likely to increase from 1.4 million to 7 million containers per annum by 2035. This growth may bring with it a plethora of problems in the form of increased traffic and consumption of fuel, mainly diesel, and the associated air pollution; noise; increased pressure for spending on transport infrastructure; provision for additional health services to cope with the subsequent increase in health problems; and a myriad of related social problems.

Over time we have become more informed about the effectiveness of vegetation for improving air quality, and it is clear that planting vegetative barriers will assist in filtering and capturing the diesel particulate matter, thereby reducing residents’ exposure to these toxic emissions. In this regard, targeting transport corridors will be of special importance.



Environment

Urban greening provides a range of environmental services such as temperature regulation, air quality improvements and carbon-dioxide storage as well as improved habitat and stormwater and catchment benefits that will assist in creating a truly liveable city.

Climate change mitigation and adaptation

Climate change is a major driver, influencing a number of environmental issues, in particular the increasing incidence of heatwaves and elevated average temperatures, and the associated prevalence of droughts and fires.

Urban greening can help reduce the effects of climate change. More trees can help absorb carbon dioxide, reducing global warming. They also cool streets and buildings, helping to reduce the use of cars and coolers that emit greenhouse gases. As Melbourne has a temperate climate with cold winters, vegetation also plays a role in reducing the use of heating in buildings by planting for windbreaks and letting winter morning sun into buildings. However, to truly adapt to the changing climate, urban greening needs to be planned, planted and maintained in a way that can cope with extended droughts, increased heatwaves and intense storms. When correctly managed, green space will then not only thrive, but also protect the community from the wind, flooding and heat events that are likely to occur due to the changing climate.

Waterway and bay health

As canopies will hold some rain, enabling it to more slowly drip onto the ground, vegetation plays an important role in slowing down stormwater flows. Well-planted vegetation will also include mulch surroundings that serve a similar role in slowing flows. By slowing and diverting stormwater flow, there is less water rushing into our waterways causing erosion and damage. It also decreases the amount of pollutants carried into our water bodies.

We are progressively learning how to plan using water-sensitive urban design. Rather than disappearing down the nearest drain, stormwater is increasingly used for irrigation, and it can often be treated through raingardens and bioretention systems to remove fine sediments and pollutants.

Increased vegetation for habitat

Many flora and fauna species in the west have been lost or are threatened due to urban sprawl and roadways, and whole ecosystems have been destroyed or fragmented. Strategic planting of appropriate mixes of plant species can improve natural habitat, promote biodiversity and create the migration corridors necessary to ensure the genetical health of existing wildlife populations.

Population growth and urban development

Melbourne's western suburbs are growing rapidly. Population data shows that all municipalities in the region grew over the decade from 2000-2010, with Melton and Wyndham growth rates being well above the state average (see Table 4). Both of these municipalities are designated as Growth Areas by the Victorian government and extensive new peri-urban development continues to bring new populations into the area.

Analysis of population growth in the six local government areas of Melbourne's west indicates that the area is expected to house an additional 250,000 people in the coming years and become home to over 1 million people by 2021.

Whilst it should be noted that the impacts of this growth are varied, the prevailing design of new urban communities does feature a number of issues that warrant concern, including:

- inadequate public transport, requiring car to be the key mode of transport and reducing the chance of incidental exercise;
- sprawling low-density estates where green open spaces are replaced by roads, houses and paved areas, creating largely impervious landscapes that retain heat;
- homes located far from services and shops, which discourages walking or cycling; and
- the fact that Victoria has the largest house sizes in the world, resulting in front and back yards being reduced to virtually nothing, discouraging any potential tree-planting in private open space and precluding natural shading and growing of fresh produce.

Table 4: Population projections for each council

	2011 population	2001-2011 actual population change (per cent per annum)	2011-2021 projected change
Brimbank	193,171	1.28	0.95
Hobsons Bay	89,356	0.47	0.77
Maribyrnong	76,703	2.09	1.83
Melton	117,448	7.82	4.15
Moonee Valley	113,299	0.16	0.82
Wyndham	178,445	6.66	4.66
Victoria	**5,623,492**	**1.42**	**1.62**

Department of Health, Victoria, 2013
Australian Bureau of Statistics, 2013

The last point is echoed in a 2007 paper by Tony Hall, *Where have all the gardens gone*, which includes the following problems with the disappearance or minimisation of private green open space:

- little to no biodiversity;
- poor microclimate, partially due to loss of shade in hot weather;
- increased run-off in wet weather;
- lack of natural ventilation; and
- increased electricity consumption.

In May 2012, the Victorian Legislative Council released a report following a Parliamentary inquiry into Environmental Design and Public Health. This report noted criticism of the prevailing post-war design of outer suburban Melbourne with its "sprawling, low density lots… that may not promote good public health outcomes. Such areas may feature less provision for physical activity (such as walking and cycling), contribute to poorer air quality due to high car emissions and fewer green spaces, and provide fewer opportunities for social interaction and building community". The report further stated that government has a key role in facilitating built environments that make it easier for people to adopt healthy lifestyles.

Planning interventions can be made to encourage healthy lifestyles in future urban developments. Such interventions may include:

- providing shaded walkways from homes and workplaces to public open space, local shops and parks as well as improving the linkages between those destinations;
- maximising public open green space usage by ensuring that the maximum distance from place of residence or work should be walkable (an accepted standard is 400 - 500 metres);
- providing quality open space for a diversity of uses, including formal sports, walking and passive recreation; and
- encouraging design of private space that minimises impervious surfaces and maximises evapotranspiration and shade.

Economy

Many of the social and environmental benefits of green infrastructure previously discussed are obvious and have been known for some time. What has been harder to articulate in the past are the substantial direct financial benefits. However, urban greening not only provides financial benefits as a preventative measure; it also provides funds through higher property values and increased retail expenditure as well as reduces energy and stormwater costs.

Reduced energy costs

Victorians will experience nominal increases of 27 per cent in residential electricity prices between 2009-2010 and 2012-2013 (AEMC 2011). This is largely due to investments to cope with increased peak demand, and studies show that shading provided by trees can reduce the load on utilities significantly by lowering temperatures between 6 and 12 degrees (Sustainable Energy Authority Victoria 2002). Estimates put the savings at 12-15 per cent per annum. Manchester University's Adaptation Strategies for Climate Change in the Urban Environment Project has found that increasing green space in cities by 10 per cent reduces surface temperatures by 4°C through evapotranspiration (Fisher 2007).

On a city scale, replacing or shading heat sinks with vegetation could reduce the urban heat island effect, thus reducing overall temperatures and energy use. Annual energy conservation from California's 177 million city trees has been estimated to save utilities $500 million in wholesale electricity and generation purchases. Planting 50 million more shade trees in strategic locations would provide savings equivalent to seven 100-megawatt power plants. The cost of peak load reduction was $63/kW, considerably less than the $150/kW amount that is deemed cost-effective for energy conservation measures by the California Energy Commission (McPherson, 2010).

Locally, direct shading of residential and commercial buildings with vegetation can make for further significant reductions in energy consumption and shield critical infrastructure from solar radiation such as UV damage, thermal expansion and melting.

Higher property values and retail expenditure

The green attractions of an area can have significant impacts on the value of real estate. One case study comes from Philadelphia, where investments in street trees saw the prices of adjacent houses rise 9 per cent (Watcher and Gillen 2006).

Well-maintained green spaces can also add value to retail precincts by boosting sales. Consumers have been found to be willing to pay 12 per cent more for both fast-moving consumer goods and higher-value items such as sports shoes in retail precincts with more street tree shading (Wolf 1999).

Reduced contamination and retrofitting costs

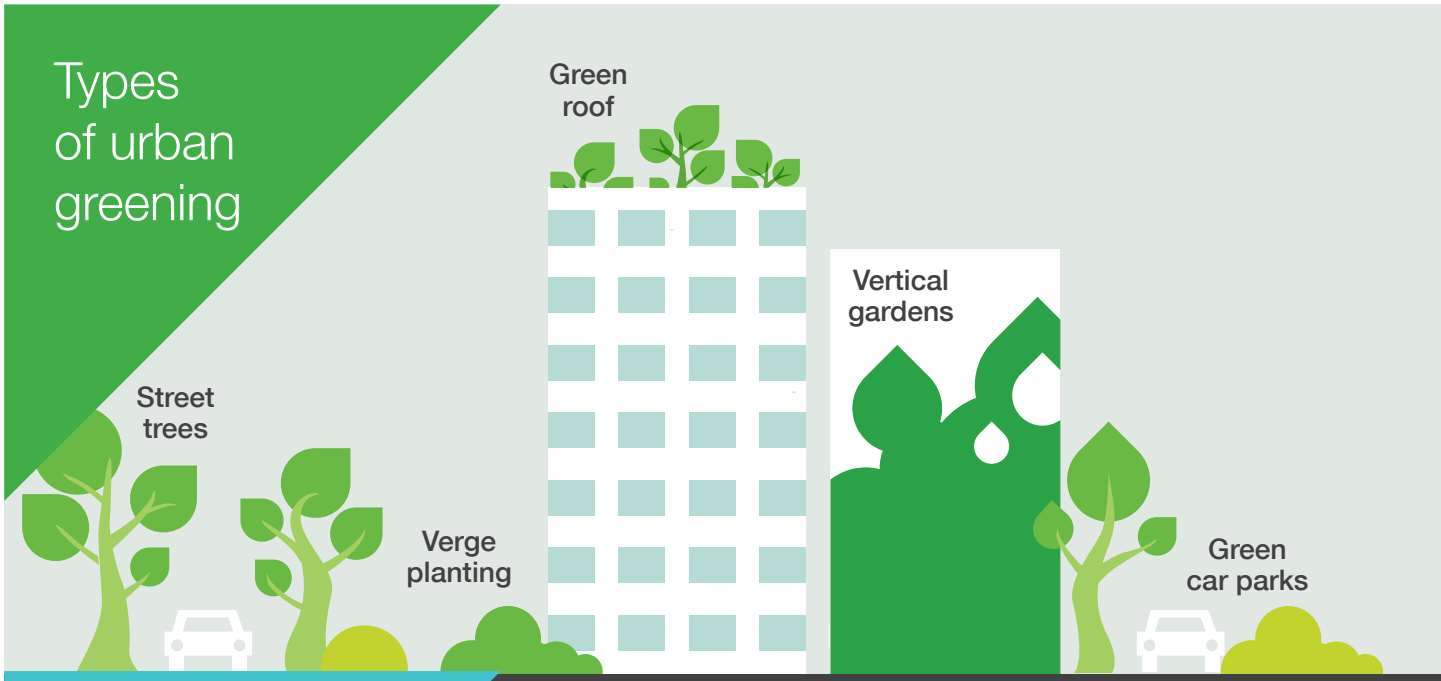
By harnessing stormwater as a resource rather than regarding it as a liability, integrated water management can reduce erosive stormwater flows and prevent contaminated runoff from entering waterways. This approach provides a low-cost solution with many co-benefits. New York City aims to capture the first inch of rainfall across 10 per cent of existing impervious surfaces in regions with combined sewer overflow systems. The City's $1.5 billion green infrastructure plan details the range of green solutions they will utilise to achieve this. They have calculated that the cost of using a multitude of rainwater tanks, street trees, porous pavements, swales and raingardens is $2.5 billion less than the cost of traditional infrastructure solutions (NYC Environmental Protection 2011).

Summary of key issues and opportunities

Urban greening presents opportunities to mitigate or prevent a wide range of health issues, ranging from obesity and diabetes to mental illness and heatstroke. It also builds social cohesion within communities and provides numerous environmental benefits, such as slowing global warming, preserving terrestrial habitats and protecting aquatic ecosystems from runoff. In addition to these benefits, which all bring significant indirect financial savings, urban greening offers direct economical benefits through cost-efficient temperature regulation and increased property value and retail expenditure.

Major types of vegetation and their benefits are described in Figure 3 below. As indicated by this figure, different forms of vegetation fill different roles. Tree-canopy cover is for instance critical to temperature regulation, whilst shrubs may provide a better wildlife habitat. It should also be remembered that the provisioning of green space requires careful consideration of factors such as accessibility, facilities and safety in order to yield optimal outcomes.

Figure 3: Types and benefits of urban greening



Benefits of urban greening

Stormwater mitigation and treatment

Urban greening reduces impervious surfaces and provides a low-cost alternative for stormwater treatment.

Carbon sequestration

Urban greening can assist in capturing and storing carbon and improve air quality by reducing fine particles in the atmosphere.

Biodiversity

Introducing a variety of native vegetation to the urban environment will provide habitat for our local fauna and increase biodiversity.

Increased property value

Tree-lined streets can increase property values by up to 9%.

Social cohesion

Urban greening can increase the opportunity for social interactions through a shared interest in sport, gardening and conservation activities.

Reduced electricity costs

Appropriately placed trees can provide thermal insulation and assist in reducing electricity costs generated through air conditioners.

Sustainable food source

Urban orchards and community gardens offer an accessible and sustainable food source for the public and encourages social interaction.

Reduced temperature extremes

Shade, evapotranspiration and insulation provided by greening can assist in reducing the impact of extreme temperature events.

Encourage active lifestyle

Shade provided by street trees can encourage active transport and walkable neighbourhoods. Well-serviced parks offer opportunities for passive and active recreation.

Increased sense of place and urban amenity

Trees can improve a community's sense of identity and pride.

Improved infrastructure life

Vegetation can reduce UV exposure, which in turn can increase the longevity of infrastructure such as roads and footpaths.

Improved air quality

Leaves capture and hold pollutants preventing them from remaining in the air. These are then washed away with rain (hopefully into raingardens, not into our waterways).

Environmental Financial Wellbeing

5 Project area environment

While the characteristics of the western municipalities are diverse, the environment of the area they cover is generally challenging due to a number of factors. These will be explored below.

Bioregion

The western region comprises close to 60,000 hectares and is dominated by the Victorian Volcanic Plain (VVP) bioregion, a large basaltic plain with several deeply incised river valleys. The general condition of the VVP is seen as degraded due to fragmentation, agricultural impacts, introduced plant and animal species, pollution and fire management in isolated remnants.

The VVP includes two significant ecological communities: natural temperate grassland and grassy eucalypt woodland. With less than five per cent of the original extent of both communities in existence, these communities are among the most under-represented and threatened ecosystems in Australia's conservation estate. Feral animal invasion, weeds and loss of native biodiversity have reduced their capacity to maintain a natural ecosystem function, and several councils have expressed concerns that final pockets of threatened grassland communities are being compromised by industrial development.

Soil

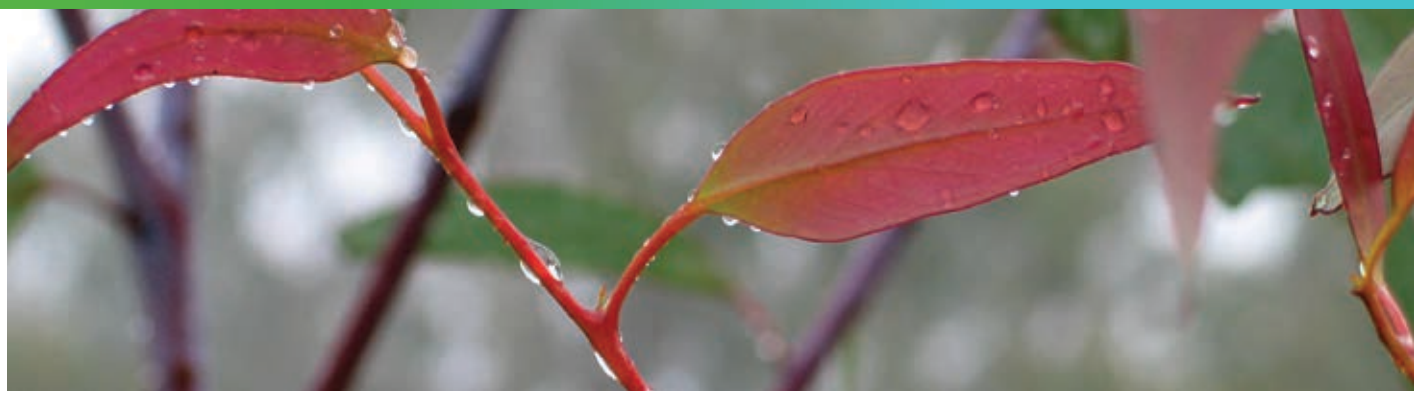
The prevailing soil type in the west is heavy clay that can be rich in nutrients yet drains poorly and often cracks when dry. Its compact nature can also make root penetration difficult. Combined with the relatively low rainfall (see below and Figure 4), the prevalence of clay soils therefore presents a challenge when seeking to establish and maintain vegetation and functional open spaces.

Climate and rainfall

The climate of the region is temperate, with the average temperature for the period 1941-2012 being 19.6°C, measured at Laverton Air Base (showing an increase in temperature consistent with global warming, the average for the period 1981-2012 was slightly higher: 19.8ºC).

Average maximum daily temperatures are 25.6°C in January and 13.6°C in July.

Due to landforms impacting on rain-bearing westerly winds, the region is subject to a significant rain-shadow effect. This results in a lower-than-average annual rainfall of 542.5mm compared to Melbourne's average of 650mm, as shown in Figure 4.



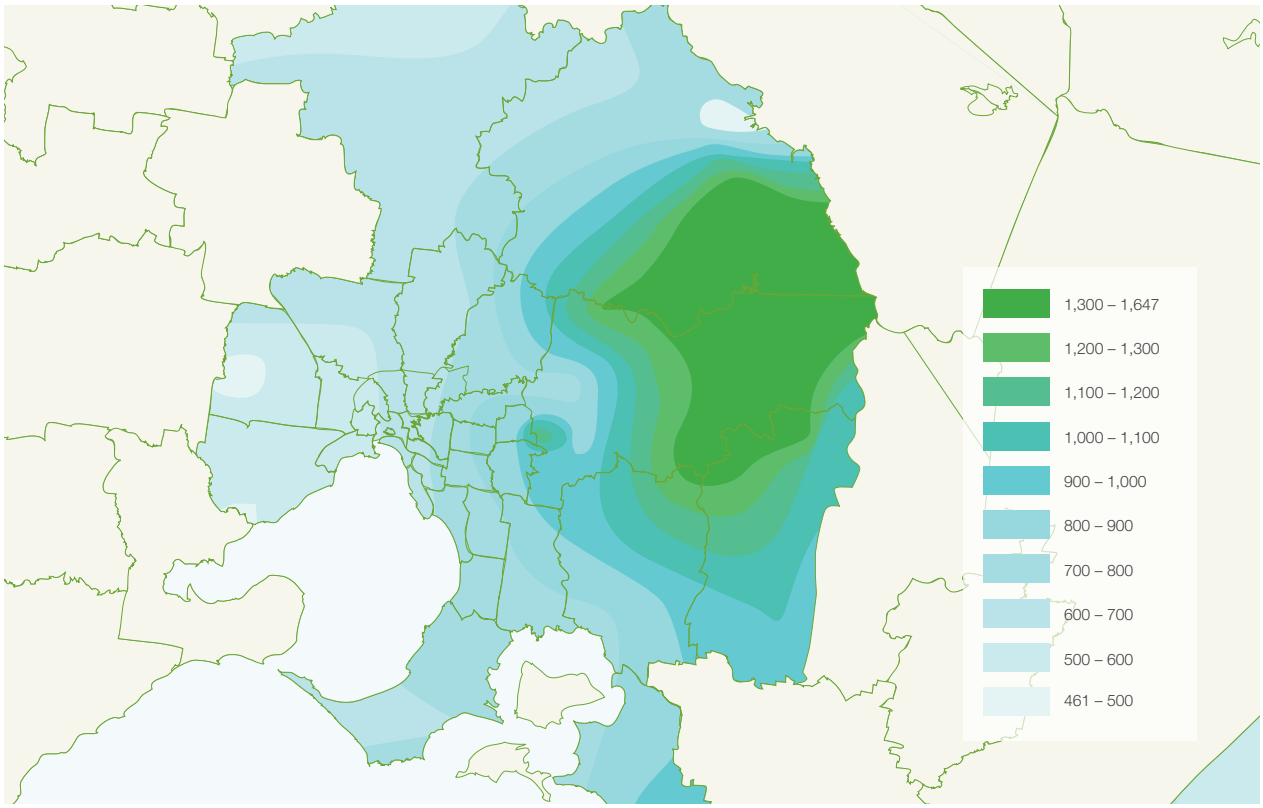


Figure 4: Rainfall across greater Melbourne
Source: Office of Living Victoria 2013

High levels of evaporation and lower-than-average rainfall makes species selection particularly important in the west, with many councils favouring indigenous species or carefully selected exotics to withstand the often dry and windy conditions.

Waterways

Department of Environment and Primary Industries data show that all of the region's waterways are in moderate, poor or very poor condition. This situation may be due to a number of factors, including:

- overall increases in impervious surfaces that contribute to high flows of polluted stormwater throughout the catchment;
- concreting and canalisation of waterways;
- direct discharges of polluted effluent;
- a deficiency in riparian vegetation; and
- impacts of invasive species.

Vegetation cover

Determining the extent of existing vegetation is an essential part of planning for the Greening the West initiative. For this purpose, satellite surveys of the natural properties of an area are highly valuable. The Normalised Difference Vegetation Index (NDVI), which measures the photosynthetic activity of the groundcover, provides a good indicator of the vegetation extent and condition. NDVI readings of 0.5 and above are considered to indicate healthy vegetation.

In 2012, Monash University completed a study of vegetation cover of the municipalities in City West Water's service area, including all of Brimbank, Hobsons Bay, Maribyrnong, Moonee Valley, much of Wyndham and parts of Hume, Melbourne, Melton and Yarra. The mean NDVI of the residential areas in this region was 0.34. This compares to a higher NDVI cover of 0.46 in Melbourne's eastern suburbs (Nury et al. 2011).

In addition to the relatively scant vegetation cover in the west, some members of the Greening the West Steering Committee have described the area as having a "fractured landscape", lacking the contiguous tree cover found in the east.

Land use

Figures 5 and 6 summarise data from the Victorian Environment Assessment Council and information from local government to create a snapshot of land use in the west. Readers should note that the proportion of impervious area provides an indication of increased thermal heat retention and that impervious areas are non-vegetated by definition.

Figure 5: Land use within the Greening the West project area

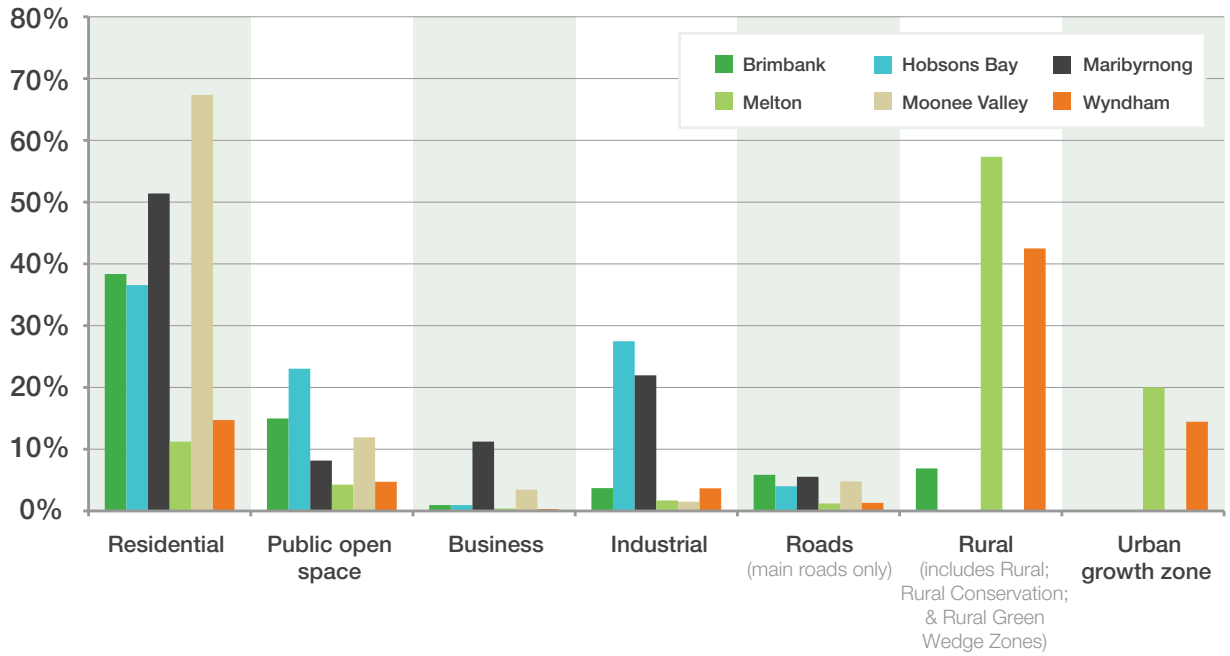
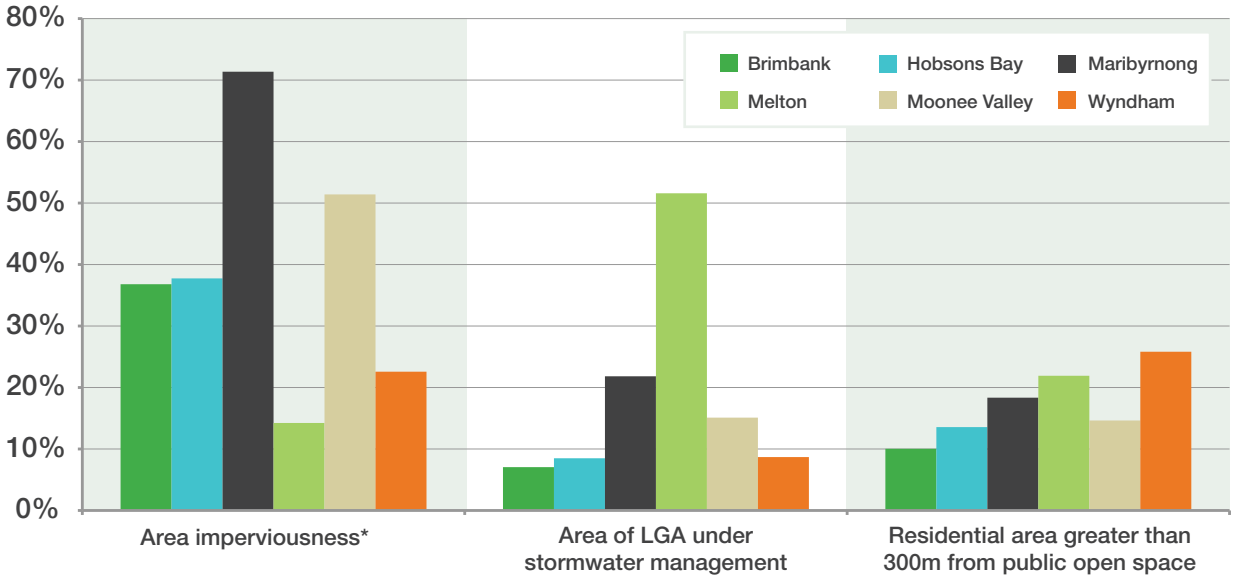


Figure 6: Land features within the Greening the West project area



**Imperviousness data is only for the City West Water portion of these councils*

Alternative water for irrigation

In recent years, City West Water has been at the forefront in the promotion of alternative water sources with councils in the region. A number of projects that will supply alternative water for irrigation of open council space are already underway.

City West Water's *Integrated Water Cycle Management Strategy* outlines the potential of future integration of new water cycle management measures to enable a healthy, liveable and prosperous Melbourne. Factors such as climate variability, population growth and trends in water use were analysed in order to deliver a diverse, resilient and robust supply system that incorporates recycled water and harvested stormwater. In summary, the strategy includes the following:

Urban growth area

City West Water proposes to service the urban growth area through an extensive recycled-water supply network that will be used for toilet-flushing and irrigation of both domestic and public open space. Numerous opportunities for local and regional stormwater harvesting have also been identified, and City West Water will continue to work with the relevant stakeholders to investigate how these best can be utilised.

Central business district and inner west

City West Water is currently investigating opportunities to provide alternative water to redevelopment areas within the central business district and inner west of Melbourne. By working with local government and development agencies, City West Water is looking to provide integrated water management opportunities to retain water in the landscape for urban greening.

Site-specific opportunities

To find additional alternative water sources for irrigation, City West Water is working with government and other stakeholders to explore customised solutions such as recycled-water systems, rainwater capture from rooftops, alternative water standpipes and local stormwater management infrastructures.

Parallel urban greening projects

Three sporting precincts

are already irrigated through stormwater harvesting, and urban design teams have been established within several of the councils.

Council commitments to future urban greening range from the planting of **28,000 new trees** by 2023, a ten-year biodiversity strategy and regionally shared trails to the setting aside of **10 per cent of sporting precincts** for general use, a strategy for nature-based play spaces and the restoration of the formerly tree-lined Old Geelong Road. Such efforts naturally further the agenda of Greening the West, and the steering committee encourage them whether they are achieved through cross-border cooperation or by individual councils. As previously mentioned, this strategic plan has not been designed to replace existing municipal strategies relating to open space; its purpose is to increase the evidence base for investments, identify opportunities and serve as inspiration and support for all greening efforts in the west.

6 Attitudes to urban greening

Greening the West has actively engaged the community along the way in an effort to gather local knowledge to inform the strategic plan. Community consultation has included a range of methods, including an online survey, face-to face-surveys and public community forums. The surveys gathered residents' thoughts on the quantity and quality of local green space and how they currently use it. The community forums discussed potential opportunities for urban greening, including barriers as well as benefits.

The range of collection methods meant both quantitative and qualitative data could be collected, allowing for greater insight into attitudes toward urban greening.

Statistical findings include the following:

71 per cent of respondents believed that the trees or shrubs in their street could be improved.

65 per cent of people said that they use parks or gardens that were not within walking distance from their home.

A third of respondents noted that playgrounds were of value to them, and most of these respondents were willing to travel to places with better play areas for children.

37 per cent of respondents expressed the need for more park infrastructure in their areas, including seating, drinking taps, barbeques, bins, walking tracks and public toilets.

86 per cent of respondents would consider looking after a street tree.

In examining the statistical data, we also noted that those who felt there was enough trees and plantings tended to reside in more established suburbs, whilst most respondents claiming there were not enough trees and green spaces resided in developing areas or within new housing estates.

The individual responses from residents during the community forums and face-to-face surveys went into greater detail and highlighted the overwhelming support for urban greening projects:

"They are an asset for us all. They make the street more attractive to native birds" (Footscray resident)

"We take pride in our residence and treat our nature strip as an extension of our garden and look after it just as we do the rest of our place" (local resident)

"Gardening provides a feeling of achievement, it provides a place to relax and be peaceful"
(Deer Park resident)

"I would like trees that shade a western back window – not sure what to plant. I would like to experiment more and become better educated about sustainability and growing food" (Footscray resident)

"Along the railway line, it's bare and ugly – there could be a nice walking/cycle track with lots of smaller native shrubs" (St Albans resident)

However, the type and maintenance of street trees also proved to be a priority with respondents:

"Get rid of the eucalypts as they are very messy and need constant trimming under power lines" (local resident)

"They have done a good job in planting new trees, but they [council] fail to maintain afterwards" (Ascot Vale resident)

"There are streets that need more tree plantings. A planting of ornamental trees besides natives to provide colour in autumn and spring" (Deer Park resident)

"We have enough, but it's the maintenance!"
(Footscray resident)


UNITY
TRE

7 Vision, goals and targets

Based on the premises discussed thus far, the vision adopted by the Greening the West Steering Committee is to enable sustainable, liveable and healthy communities through urban greening. To support this vision and provide a framework for action, The Greening the West Steering Committee has adopted the following principles:

- Efficiency – doing more with less.
- Collaboration – sharing resources and knowledge for better outcomes.
- Sustainability – ensuring greening solutions are balanced and long-term.
- Community engagement – facilitating community ownership.

Building on these principles, the following eight key goals and targets have been set.

Goals	Targets
1. Maximise urban greening	• Double tree canopy cover in the west by 2050 • Green space to be increased by 25% by 2030
2. Improve quality and functionality of green space	• Ensure quality and well-designed green open space for all communities
3. Increase the use and interaction of residents in green space	• All residents to have access to quality green space within 400 – 500 metres from their home • Enhance the range of facilities to maximise use and participation • Improve tree canopy cover to promote connectivity between urban places
4. Improve the health and social wellbeing of residents	• Improve the health indicators of the west
5. Showcase the economic and intrinsic value of urban green space	• Create a business case for each green space project
6. Improve environmental quality	• Create benchmark standards for stormwater quality, air quality, natural habitats and heat stress
7. Advocate green spaces to all levels of government and key stakeholders	• Annually showcase five Greening the West projects • Increase engagement and investment from stakeholders and government bodies • Lobby all levels of government and stakeholders to maximise greening outcomes • Each council to establish a tree protection overlay
8. Maximise sustainable water supplies to establish and maintain green space	• Identify opportunities for alternative irrigation of green space • 25% increase in supply of alternative water for green space by 2030

8 Barriers and constraints

In order to reach the targets set out, it is important to get a solid understanding of the challenges currently hampering many urban greening programs. As outlined below, obstacles include aspects of finance, ideology, limited knowledge and cooperation. These constraints are shared across the project area, underlining the need for a collaborative regional approach to urban greening.

Finance

Recent global financial uncertainty has restricted spending by governments and created an increased emphasis on private-sector sponsorship and donations. Whilst there are a number of ad-hoc greening and rehabilitation efforts currently being made by some larger private companies (for example, Toyota are sponsoring urban greening, particularly along lower Kororoit Creek), there are however very few formally coordinated funding schemes to incentivise private investment in the establishment or maintenance of green infrastructure in the west. The majority of private sector contributions are in fact derived from penalties for various environmental non-compliances.

There is in other words a clear need for concerted efforts to encourage greater private investment in urban greening. VicRoads' "Adopt a Highway" scheme is an inspiration in this regard, but whilst this initiative has resulted in a number of main roads in the east being maintained through private sponsorship, it is yet to attract any sponsors in the west.

Raising funds for urban greening is particularly challenging due to the fact that the return on investment cannot be measured using conventional means. It requires a complex process based on models and targeted research. More often than not, governments therefore need to lead the way to help private enterprises look past benefits that are immediately obvious and isolated to their particular sector. By using recently introduced assessment tools such as i-Tree and Capital Asset Value for Amenity Trees (CAVAT), governments can place a dollar value on green infrastructure, making it easier to consider in the same light as traditional infrastructure.

Appropriate valuation provides the opportunity to:

- attract private and government investments;
- advocate for changes to policies that influence urban greening; and
- gain community support.

It is also imperative to budget for ongoing maintenance when planning for green infrastructure. In asset management, it is generally accepted that the annual maintenance cost of a project is 5-10% of the capital cost. This figure applies to areas that have a high profile or high public visitation. For more natural areas, which require less frequent maintenance, the corresponding figure is 3% per year.

Insufficient maintenance budgets result in poorly functioning systems that offer little to no value and often will be replaced by low-maintenance and low-quality alternatives (and this naturally also applies to assets gifted from developers). This in turn makes it harder to rationalise new investments. As one stakeholder noted, it is difficult to sell the vision of more urban greening if what you already have is of poor quality.

Ideological aspects

Infill developments are incrementally eroding net green space in established estates, and in new developments, urban greening is under constant pressure from the drive to maximise the coverage of single-dwelling lots. There is a need to instill a better understanding in urban planners that although pushing for 15 lots per hectare contains urban sprawl to a degree, it is counterproductive to urban greening efforts. With house sizes remaining very large in relation to the lots they occupy, it results in minimal private green space, often with an absence of trees, and also leads to a reduction in the size of nature strips along street frontages, thereby limiting or precluding the opportunity to plant shade-producing trees in the public space. Furthermore, decreased public space can put greening initiatives in conflict with underground or overhead services.

Limited knowledge

Whilst there are many inspirational examples of successful urban greening in the west, there is still much to learn about appropriate vegetation for the various environments here. Important questions include adequate soil moisture for healthy and sustainable vegetation growth; risks associated with pests and diseases; and the long-term accumulation of contaminants in soils, particularly in stormwater retention and tree pits in new urban developments. In addition, contaminated land can also pose technical and financial barriers to urban greening. There are also issues with some contractors not understanding the unique challenges posed by the clay soils, low rainfall and high levels of evaporation. Unfortunately, a history of poor design, poor vegetation selection, insufficient resourcing and inadequate maintenance has already created a legacy of negative perceptions for some greening projects in the west.

Collaborative issues

A number of well-intentioned urban greening projects are currently being undertaken in isolation from each other. The outcomes of these and future initiatives can however be optimised only through cross-border collaboration between local governments and private-sector stakeholders. Building a collaborative culture is key to the successful implementation of Greening the West. The power of collaboration has already been showcased by the members of the Greening the West Steering Committee, and additional partners now need to be brought on board. Notably, this involves sharing ownership of Greening the West with all community residents.

9 Strategic directions

To achieve the targets and realise the long-term vision to enable sustainable, liveable and healthy communities through urban greening, project partners should be guided by the following four strategic directions.

Direction 1 – Plan for community health and wellbeing

Climate change, an ageing population and the rapid expansion of the west are applying pressure to our communities. For largely established municipalities like Brimbank, Hobsons Bay, Maribyrnong and Moonee Valley, challenges include providing open space and ensuring funding is available to maintain these spaces to a high quality. In Maribyrnong, the increasing density of suburbs such as Footscray mean a lack of open space is exacerbated, and novel approaches such as nature-strip food production are being explored to make best use of limited sites.

For Melton and Wyndham, councils that are part of the urban growth corridor, the needs of existing suburbs must be balanced with negotiating developers' requirements for new estates and ensuring that gifted assets can be maintained in the long term. Quality public open space must be accessible and functional to offset increases in population and the decline in private open space.

While there are marked differences in the actions required from each municipality, an overarching common objective emerged from the Greening the West Steering Committee – planning must be holistic and take community health and wellbeing into account. To bring these matters to the forefront, the committee identified the following three key measures:

- provision of accessible, high-quality open space to support improved mental health and encourage physical activity, thereby decreasing the incidence of obesity and diabetes;
- provision of shaded, cool spaces in streetscapes and public spaces through placement of large-canopy trees; and
- improvements to air quality by capturing particulate matter from road and rail transport.

For established suburbs, this will require an understanding of the current landscape to map deficiencies and set priorities according to health needs. For example, Department of Health data map populations that are particularly vulnerable to heat stress or feature high rates of obesity, diabetes or poor self-reported health. This data could be combined with green space inventory data to identify where the greatest positive health outcomes can be achieved. Brimbank has for example identified Sunshine North as a priority area due to lack of open space and high rates of diabetes and poor self-reported health.

Health profiles for growth areas are yet to be established. Planning for health therefore takes on a preventative nature in these areas.

It is essential that Precinct Structure Plans (PSPs), developed by the Growth Areas Authority in partnership with councils and developers, provide accessible open space and large-canopy street trees. To this end, councils should work closely with utility providers such as City West Water, Western Water and Melbourne Water in order to support maximum tree growth and prevent underground services from inhibiting the formation of root systems.

To promote incidental activity, consultation to inform this strategic plan also stressed the importance of connectivity, not only to open space, but to walkable neighbourhood destinations. Walkable corridors require shade and safe unencumbered access to encourage maximum use.

Direction 2 – Advocate for policy and institutional change

Whereas a one-member organisation rarely can be expected to champion an issue on its own, 18 organisations under one regional entity can wield significant clout. The breadth of the Greening the West Steering Committee members and their respective network of contacts provides a valuable platform to advocate for policy and institutional change.

Advocacy for greater levels of funding for urban greening will form part of the ongoing agenda for Greening the West. Special emphasis will be given to budgeting for maintenance of green space to ensure that its quality remains high enough to facilitate continued use and benefits.

Steering committee members have also spoken of the language of urban greening and its importance in informing discussion within their organisations. Some described a shift where plants in all forms, although particularly trees, are now thought of as assets rather than liabilities. This shift is however not universal; others recounted examples of Precinct Structure Plans in which trees were the first element to be removed when a conflict with underground services was anticipated.

It is recommended that the Greening the West alliance continue to lobby the Growth Areas Authority and developers to ensure that adequate space is given to trees, taking into consideration underground services, maintenance regimes and irrigation options. To truly

provide the amenity, exercise and cooling benefits required in both growth areas and established suburbs, the number of large-canopy trees must be maximised.

In addition to the Greening the West Steering Committee, there is a network of interested potential project supporters within government agencies and the private sector. Groups such as health insurance providers and health promotion organisations have a vested interest in improving health outcomes in the west and may wish to support Greening the West projects through in-kind or direct financial investments.

With its focus on contributing to a "liveable, sustainable and productive Melbourne", the Office of Living Victoria (OLV) may also prove to be a keen ally of Greening the West. It is recommended that the Greening the West Steering Committee liaise closely with OLV representatives to identify key opportunities.

Direction 3 – Communicate, connect and educate

Given the combined reach of the Greening the West alliance, there is a great opportunity to engage the public and promote the broad benefits of greening. Much like the water conservation campaigns that garnered community support and interest, there is room for a public conversation on valuing our communities' green assets beyond their aesthetic worth alone. It is hoped that this will lead to greater use of public spaces and extend to encouraging greening in private space.

To truly impact the collective psyche of the west, tangible demonstrations of greening in action are needed, and this is certainly occurring to great effect within councils and regional parks. Demonstration opportunities are unlimited, as exemplified by the success of Maribyrnong's Yarraville Village pop-up park, the recent addition of trees to JBS' abattoir in Brooklyn and the pilot project for greening the Geelong Road arterial, which was endorsed by Greening the West. Other activities such as green wall demonstrations and planting along railway corridors can demonstrate the benefits of greening in diverse and tangible ways. Marketing opportunities abound, and it is recommended that a communications plan for Greening the West follow the development of this strategic plan.

Direction 4 – Promote collaboration and secure commitment

The Greening the West Steering Committee represents an enthusiastic coalition of partners that recognise the benefits of collaboration, which can take many forms – from informal sharing of ideas and knowledge through to joint activities to promote the benefits of urban greening on a broad, regional scale. Table 5 describes the range of collaboration opportunities identified through the consultation process.

Table 5: Collaboration opportunities for Greening the West partners

Efficient implementation	Attracting and sharing resources	Knowledge-building and sharing	A united voice
Cross-council-border project collaboration Benchmarking to share performance data and improve contracting outcomes Joint procurement opportunities	Shared access to technical experts through the Greening the West network (both in-house and external) Harnessing new funding sources	Research Piloting innovations to test new ideas Education of the steering committee and local urban greening industry practitioners Monitoring and management of information Sharing of technical knowledge, e.g. performance of Water-Sensitive Urban Design (WSUD) systems	Communications to engage the community and influence attitudes on issues common across the region Advocacy to promote urban greening benefits to influence policy and attract resources Navigating silos to access budgets and ensure decision-makers take the full values of urban greening into account

10 Conclusion

Greening activities have traditionally been regarded as having purely aesthetic and environmental values. Recent scientific advances and the development of new assessment tools however confirm that these rather obvious benefits are surpassed by less obvious advantages relating to health, wellbeing, social cohesion and economy. With the vision “to enable sustainable, liveable, healthy communities through urban greening”, an immediate focus of Greening the West is therefore to educate both stakeholders and the public.

Spreading the current state of knowledge will pave the way for the investments required to reach the targets set out by Greening the West and ensure that any measures taken are appropriate to the challenges posed by the natural environment of the west. Planning and on-ground actions will then have to be coordinated between stakeholders and across council borders to yield optimal results. Including representatives of all concerned councils and water corporations as well as from a number of other supporting state bodies and organisations, the Greening the West Steering Committee is uniquely placed and carries the political authority and commitment to achieve the desired outcomes.

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Greening the West is an initiative that aims to deliver positive health and social outcomes and enhanced liveability for communities in the western suburbs of Melbourne. It is driven by a steering committee consisting of the following collaborative and committed partners:

City West Water

Brimbank City Council

City of Melbourne

City of Melton

City of Moonee Valley

City of Yarra

State Government Victoria – Department of Environment and Primary Industries

Department of Health – State Government Victoria

Hobsons Bay City Council

Hume City Council

Maribyrnong City Council

Melbourne Water

Parks Victoria – Healthy Parks Healthy People

Regional Development Australia

Urban Development Institute of Australia Victoria – enviro DEVELOPMENT

vicroads

Western Water

wyndhamcity – city. coast. country

Yarraville On The Nose Community Group