Green Infrastructure Strategy

2012-2031

Moreton Bay
Regional Council

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Executive summary

Green infrastructure describes a network of connected environmental assets which provide lifestyle sustaining benefits called 'ecosystem services' to the community.

Street trees along footpaths offer shade and aesthetics for pedestrians; vegetation buffers along waterways help improve water quality in our rivers and ultimately Moreton Bay; large trees retained in urban areas make up the character of a place; bushland provides habitat for priority species such as the Koala.

Green infrastructure linkages, such as waterway and ecological corridors, support the movement of people between places, as well as animal and plant movement, dispersal and refuge.

The green infrastructure network planning approach is being applied by Moreton Bay Regional Council to value environmental assets and provide solutions to address environmental impacts associated with land use change, as well as to enhance urban design and create a sense of place.

The region is projected to grow by an additional 150,000 residents by 2031. Growth will take many forms across the region, from new communities in areas containing intact bushland, to transit-oriented developments around rail stations and activity centres requiring trees for aesthetics and shade.

This growth presents opportunities to ensure green infrastructure solutions are incorporated into the design of new developments and infrastructure upgrades. In this way, green infrastructure solutions enable growth and build development confidence though flexible management of environmental values.

The Green Infrastructure Strategy has been developed to ensure the maintenance of a healthy natural environment as our region grows while allowing for meaningful connections between people and nature.

This Strategy is primary policy that integrates green infrastructure principles throughout Councils operations and in new development. This strategy details what is required to ensure a healthy green infrastructure network is maintained and enhanced over the next 20 years.
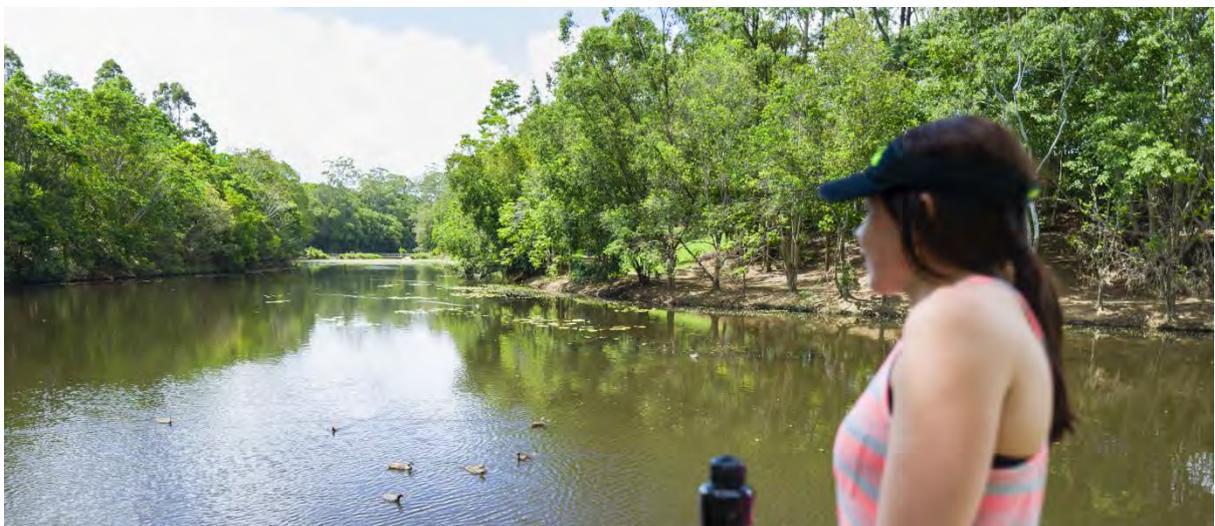
Introduction
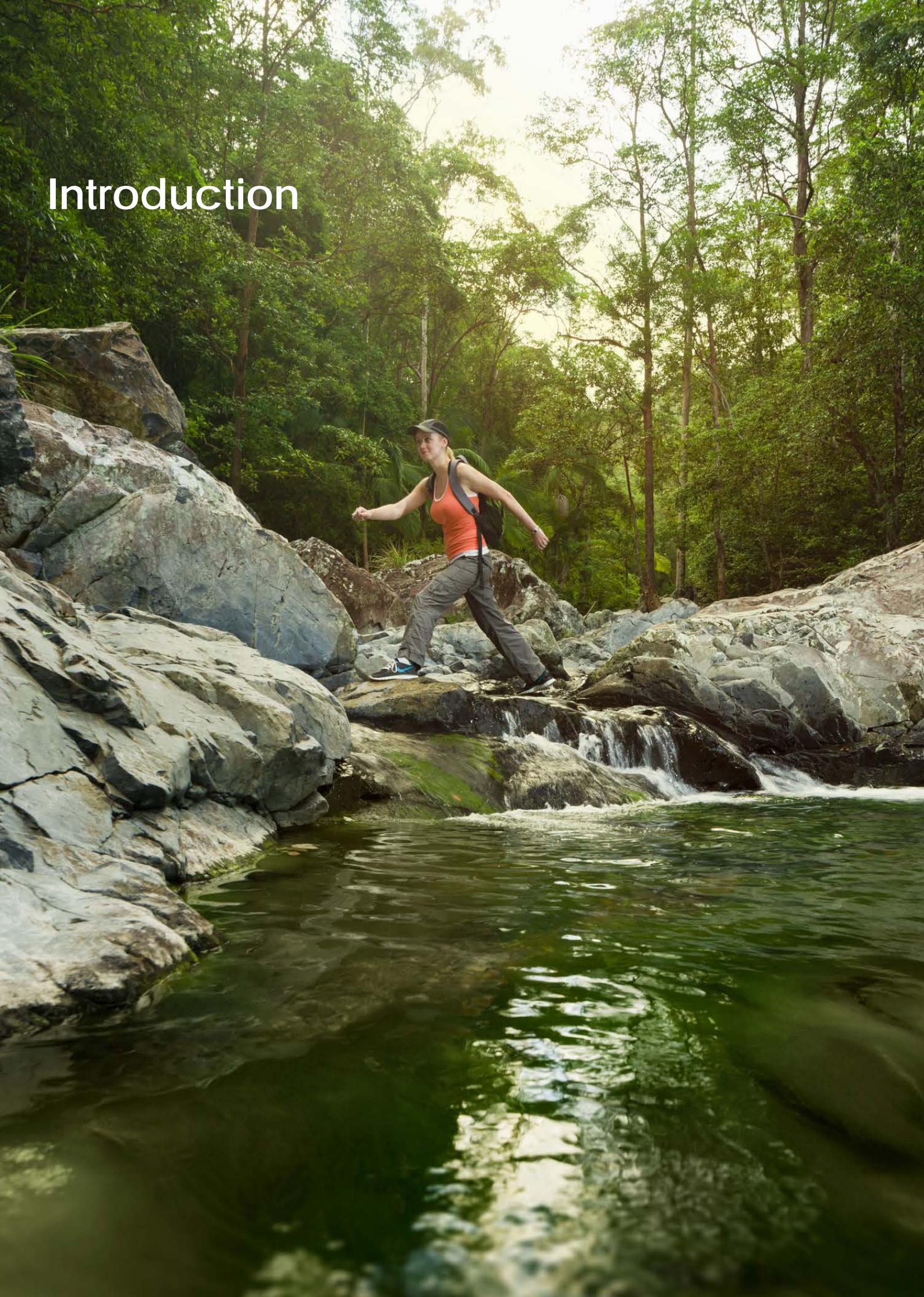
What is green infrastructure?

Green infrastructure is a multi-functional network of natural ecosystems, semi-natural environments and engineered green spaces and assets across Moreton Bay Region.

Green infrastructure refers to natural, semi-natural and engineered green assets that are connected across a landscape. Green assets include parklands, waterways and wetlands, large and small tracts of natural and re-established ecosystems, ecological corridors, grassy fields, street and habitat trees, community gardens, drainage swales, and innovative technologies such as vegetated roofs, bio-retention basins, wildlife crossing and nesting infrastructure.

Natural green infrastructure Reserve for Recreation and Environment, Woorim
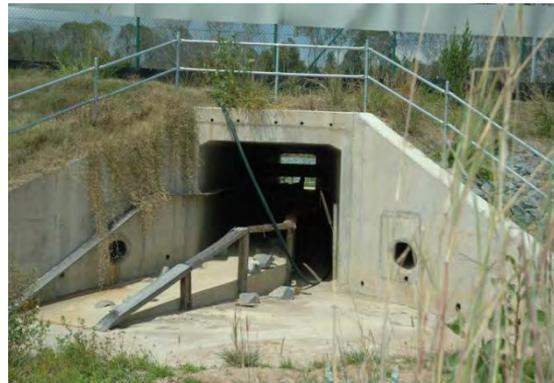
Engineered green infrastructure Koala Movement Underpass, SEQ

Semi-natural green infrastructure Street trees providing shade and wildlife habitat & refuge, Narangba

Semi-natural green infrastructure Bioretention basin, North Lakes

Components of the Green Infrastructure Network in Moreton Bay Region

Moreton Bay's green infrastructure network recognises ten key components each contributing unique and complementary environmental values to the green infrastructure system.

Environmental Area

Key wildlife breeding and refuge areas, ranging from large patches of native vegetation to places containing scattered vegetation which wildlife use to forage, breed and shelter.

Managed Forests

Commercial plantations and managed native and non-native woody vegetation, including forestry resources and offset managed areas.

Environmental Corridors

Linkages of aquatic, creek side and overland vegetation supporting the transport of animals and plants and providing substantive habitat in itself.

Grassy Fields

Grassy parklands, sport and recreation areas allow animal movement and contribute to urban heat island relief. Grazing land provides habitat for many native animals including kangaroos, echidna and birds of prey.

Urban Forests

Urban trees and other vegetation provide critical ecosystem services to people. Urban vegetation improves air and water quality, offers shade, captures and stores carbon and provides character to a place.

Green Engineering

Designed green spaces such as urban wetlands manage stormwater runoff. Nesting boxes offer safe shelter and improve habitat.

Wildlife Movement Infrastructure

Designed infrastructure such as road underpasses, land bridges, wildlife funnel fencing and rope bridges help wildlife move safely through the landscape.

Stepping Stones

Small patches of habitat such as isolated habitat trees or groups of trees help animals to move safely through urbanised areas.

Street Trees

Predominantly linear urban landscaping providing shade, aesthetics, place character and urban wildlife habitat.

Residential Gardens

Typically private gardens that contribute to the overall green space within a place.

Why is green infrastructure important?

Green infrastructure provides lots of benefits (often referred to as 'ecosystem services') to our community. Good examples of this are urban trees (urban forest canopy) which provide wildlife habitat and biodiversity value. Tree shade encourages outdoor activity. Urban trees deliver measurable economic benefits such as reducing energy costs.

Other services offered by green infrastructure include filtering chemicals, nutrients and sediment out of stormwater before it reaches our waterways, mitigating flooding and enhancing local amenity and creating street character. Green infrastructure adds essential value to the community and helps to create a sense of place.

Benefits offered by green infrastructure

Reinforces sense of place and city identify

Improves community cohesion

Reconnects children with nature

Encourages outdoor activity

Reduces heat related illness

Reduces sun exposure

Improves mental well being

Reduces flows & nutrients in stormwater

Enables health savings

Reduces air pollution

Avoids costs of infrastructure damage

Provides shade and cooling

Increases property values

Provides habitat and greater biodiversity

Enables energy savings

Assists in carbon trading

Green Infrastructure across our Region

A key principle of green infrastructure planning and design is to build strong connections between natural, semi-natural and engineered green assets to ensure linkage of the network across the Moreton Bay region.

Green infrastructure occurs within highly urbanised suburbs of our region, in forms such as street trees, wetlands built for stormwater treatment, purpose built wildlife crossings and open space areas. Environmental corridors weave through both urban and rural landscapes, connecting the urban green infrastructure to larger bushland tracts and protected natural areas that typically occur in rural areas.

Research has shown that a strong connection between people and nature improves individual and community health and wellbeing. Planning for a well-connected green infrastructure network will contribute to regional community prosperity.

Who manages green infrastructure?

Green infrastructure can occur on both public and private-owned land. In the Moreton Bay region most green infrastructure occurs on private land, in the form of backyard trees, local creeks and grassy landscaping.

The community has an important role to play in managing private green spaces which contribute to a larger, connected green network. Private green infrastructure provides the 'stepping stone' fabric that links other green infrastructure components within the regional network.

Local and state governments deliver a planning and regulatory framework for the management of green infrastructure, through vegetation and fauna conservation initiatives, as well as a suite of green infrastructure monitoring and enhancement activities, habitat planting and wildlife movement infrastructure surveys.

Embracing green infrastructure

Green infrastructure benefits everyone in our region. The success of a healthy and productive green infrastructure network requires the commitment of our community and all tiers of government. Green infrastructure provides environmental solutions for development and contributes strongly to the health, liveability and wellbeing of the Moreton Bay region and its community. Innovative development and management solutions should integrate green infrastructure into urban and rural landscapes to ensure our community continues to receive the benefits of a healthy and productive environment.

What can a green infrastructure strategy deliver?

Moreton Bay Regional Council's Green Infrastructure Strategy details how Council plans and delivers green infrastructure solutions across the region. It details what is required to ensure a healthy green infrastructure network is maintained and enhanced over the next 20 years.

The Green Infrastructure Strategy integrates with other infrastructure networks, such as roads, pathways, parks, sporting and community facilities and stormwater infrastructure, to ensure that all infrastructure types are designed, constructed and managed in line with green infrastructure principles.

Council's Policy Framework

Policy	Outcomes	Infrastructure Strategy
	Valuing lifestyle	Green Infrastructure Strategy
Community Plan	Creating Opportunities	Open Space Strategy
		Transport Strategies
		Water Strategy
	Strengthening Communities	Community Infrastructure Strategy
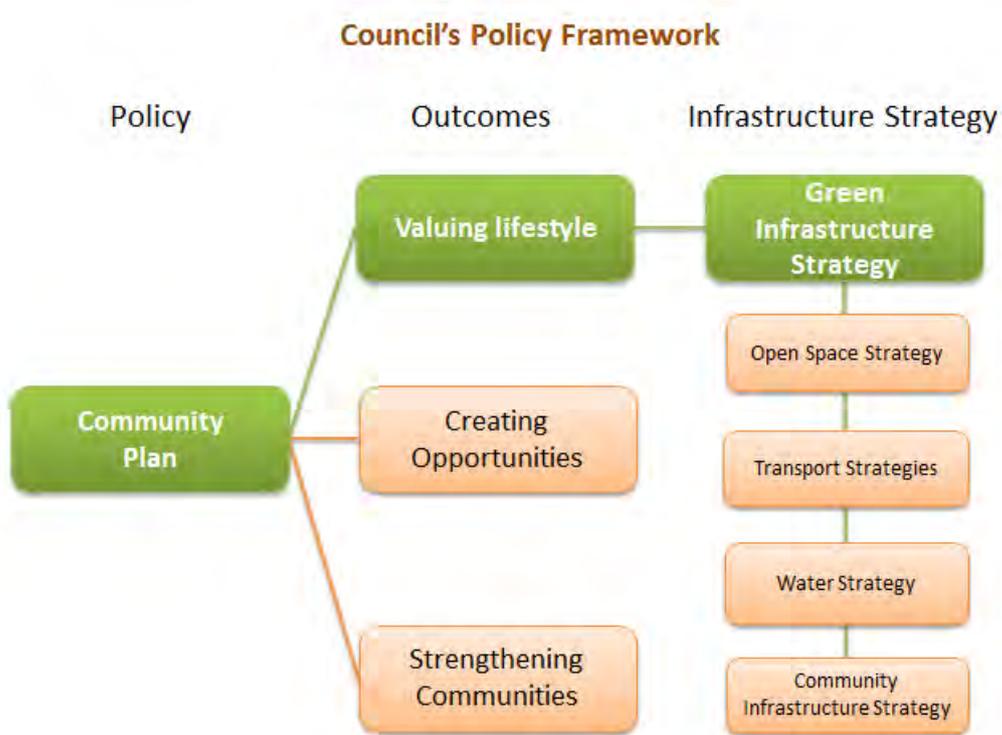
Moreton Bay Region's Community Plan was developed in 2011 and was prepared in partnership with community groups, businesses, state agencies and local residents. The Community Plan identifies a number of community outcomes, themes and targets which green infrastructure can help deliver.

Target 19:

Improve the condition and extent of high-value vegetation and protect native species.

Target 20:

Increase the health and resilience of waterways and coastal areas.

Our Vision

'A healthy and productive network of natural, semi-natural and engineered green spaces and assets valued for what they are, the ecosystem services they provide, and their contribution to regional biodiversity and environmental resilience'

Principles

The principles for the planning and design of Moreton Bay region's green infrastructure network guide the application of green infrastructure at a local, district and regional level. Applying these principles to green infrastructure outcomes will ensure Council's vision for a healthy and productive natural environment is achieved throughout the region.

Linkage

Strong connections between green infrastructure components will contribute to a healthy and productive green infrastructure network. For instance, environmental corridors and street tree boulevards will facilitate movement of animals, plants and seeds. Linkage of the green infrastructure network across diverse landscapes including both public and private lands will allow for plant and animal movement between both private and public spaces, assisting with species adaptability and resilience into the future.

Building strong linkages between people and nature improves individual and community health and wellbeing. Planning for a well-connected green infrastructure network will contribute to regional community prosperity.

Multi-functioning

The green infrastructure network will be planned and designed to promote healthy environments that are appropriate to location and setting. There will be a focus on creating highly productive green spaces that retain and promote natural, semi-natural and built environmental assets encouraging a shared use of space. In town centres for example, street trees and vegetated stormwater management systems will provide shade and aesthetics to pedestrians, while creating a habitable climate by cooling otherwise hot urban environs. In parkland settings, bushland areas, grassy fields and scattered trees will encourage a connection to nature and provide recreation opportunities for people, while allowing wildlife to move through the area.

Street trees offer shade and aesthetics to transport users, and provide linkages between other green spaces (SEQ).

Integration

Green infrastructure considers and complements other infrastructure types through integration. Environmental impacts can be reduced or reversed by incorporating green infrastructure at design stage. For instance, where a planned road upgrade will cause habitat to become fragmented, a wildlife underpass, overpass or substantial street tree linkage may help to maintain habitat connectivity within the green infrastructure network. Planning for the Moreton Bay region's green infrastructure network involves consideration of future growth predictions and alignment of the network with long term regional planning responses, including Council's other infrastructure strategies such as the Water Strategy. Integration ensures a strongly flexible and resilient network where green infrastructure can be designed to suit the needs of a community - whether highly urbanised, commercial or rural.

Flexible

Green infrastructure offers opportunities to strengthen environmental values while supporting development and other associated infrastructure networks. There are many green infrastructure solutions that can be designed into new developments, providing flexible choices appropriate to location and setting.

A long-term approach is used for the green infrastructure network to ensure that as land use changes the balance and integrity of the green infrastructure network is maintained. Green infrastructure will be included as part of development design to ensure linkages across the landscape. Where unavoidable environmental impacts such as vegetation clearing occurs, we will seek to counterbalance the impact by replacing the vegetation in other areas in our region.

Diversity

The diverse natural landscapes of the region support an amazing variety of plants and animals and habitats. Maintaining and improving biodiversity increases the health of the environment.

The green infrastructure network contains unique environmental assets of national, state, regional and local importance. These environmental resources have value beyond their direct use, including aesthetic values which increase community wellbeing and connectedness to nature.

Tree retention along Young's Crossing & Francis Roads at Joyner; providing green linkages for animal movement (particularly koalas), shade for pedestrians and pleasant visual amenity.

Sustainable

Our environment is changing with a swiftness not seen in previous generations. Rapid environmental change presents tremendous uncertainty for ecological communities and natural systems and the plants and animals that inhabit them. Green infrastructure will provide short and long term solutions that are locally focused and innovative.

Sustainability is most effective when it is not an end in itself, rather when it becomes a pathway to maintaining and enhancing healthy and productive environments.

The Green Infrastructure Strategy provides the Moreton Bay Region with a framework that enables growth by providing flexibility and certainty about how to manage environmental values through development.

Evidence based

For the Moreton Bay region, green infrastructure components are selected using scientific data that is validated through remote sensing, field monitoring and ground truthing against predetermined criteria such as ecological value and consideration of future land use intent.

All other green infrastructure planning principles rely on evidence-based decision making.

An example of fauna friendly fencing incorporating habitat trees (SEQ).

Rope bridges connect habitats and enable climbing fauna to cross roads, railway lines and easements safely (NSW).

Snapshot of the Region

Regional profile

The people and the environment of the Moreton Bay Region

The Moreton Bay Region stretches from the Hills District in the south to Woodford in the north and from as far west as Mount Glorious, to the shores of Moreton Bay.

The region covers over 2,000 square kilometres and has an estimated resident population of 390,000 people (2011). The Moreton Bay Region accounts for 19% of the population of Greater Brisbane and is the third largest by population and third fastest growing local government area in Australia (2011).

The natural areas of Moreton Bay define the region as a place where wild natural beauty can be enjoyed and appreciated by residents and visitors.

Moreton Bay is a region of biological diversity due in part to the influence of a temperate to subtropical climate. Hot humid summers with monsoonal influence give way to dry moderately warm winters; and the western mountain ranges enjoy a cooler altitudinal climate. Complex geological land formations have allowed a wide variety of plant communities to thrive.

The region is:

- Fringed by 45km of coastline, extending north from the Pine River estuary and Hays Inlet to the Pumicestone Passage and Bribie Island;
- Flanked by the D'Aguilar Range of mountains which stretch from Brisbane to Woodford; and the southern ends of the Blackall and Conondale Ranges;
- Has rich floodplains are fed by an extensive river and stream network.

Region summary

- The Moreton Bay Region covers over 2,000 square kilometres.

- The region's population is approximately 390,000 people.

- The region is expected to grow by an additional 150,000 people by 2031.

- The region is fringed by 45km of coastline to the east and the D'Aguilar Range of mountains to the west.

- An extensive river and stream network traverses the region.

Population and jobs growth

The Moreton Bay Region has experienced rapid and sustained growth in population and jobs since the 1950's. Information on population and jobs gives us valuable insight about people that reside and work in the region and how their lifestyles may be changing. This helps Council make informed decisions about policy and investment to intervene and influence the future direction for the region.

Until the year 2000, annual growth in both population and jobs tracked at a similar rate. Since the year 2000, job growth within the region has not accelerated at the same rate as population growth; 44% of all working Moreton Bay residents now commute outside our region to work. This is likely to double if the trend in jobs growth continues to 2031, a trend not encouraged by Council. Achieving a better balance is crucial to meeting the lifestyle aspirations of the region's residents and the economic outcomes sought by the business community.

This has implications for the lifestyle of our residents and all forms of infrastructure. Those residents who spend more time travelling outside the region for work are likely to have less social time. This can lead to a cycle of highs and lows on demand for infrastructure such as roads, community facilities and parks. These types of facilities can become very busy in peak periods.

Populations and job trends allow for growth predictions that may influence the nature of the green infrastructure network. These predictions allow Council to plan ahead for the green infrastructure network to ensure this infrastructure type is integrated with other infrastructure types to service our growing community.
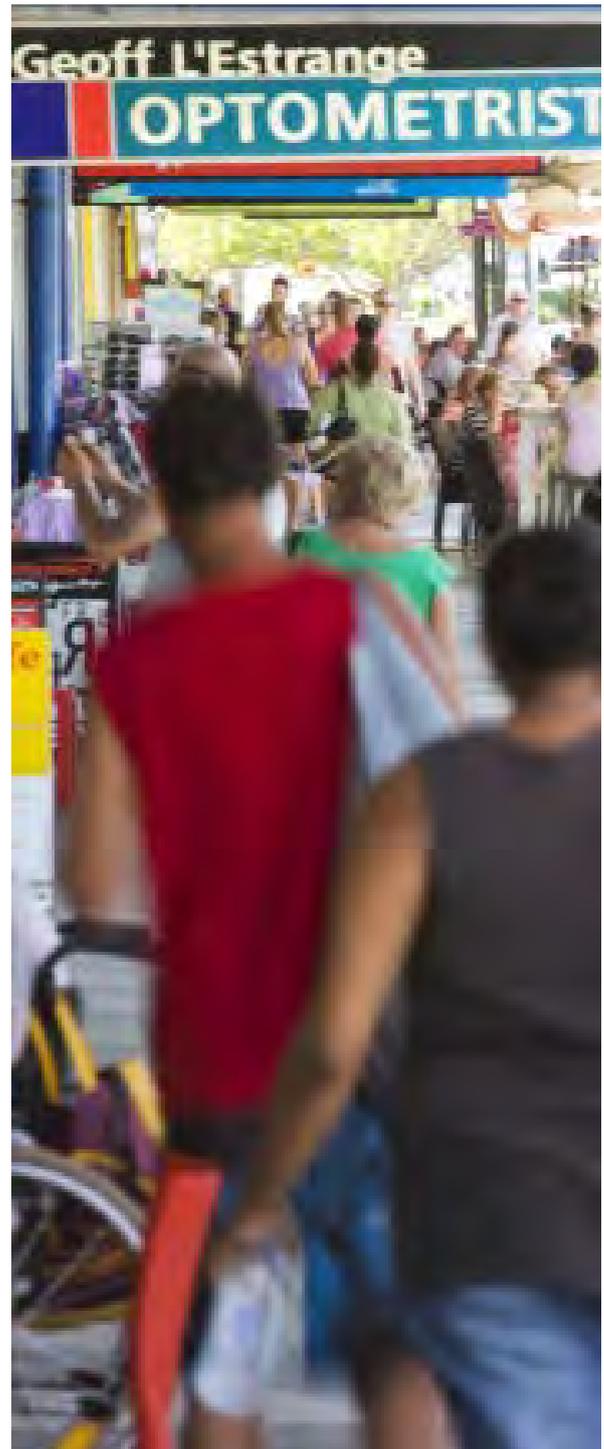
Age and households

When compared to other local government areas within a similar distance to the Brisbane CBD (e.g. Logan and Ipswich), the Moreton Bay Region shows some unique trends in age distribution. The region has a very low number of people aged between 17 and 35, most likely because some young adults migrate away to take up social, educational and career opportunities elsewhere. We see a lower proportion of infants and children below the age of 5.

People from about the age 35 onwards make up a high proportion of those who tend to migrate into the region. These new residents tend to be second or third home buyers, upgrading their homes from cheaper suburbs on the urban fringe or from other local government areas like Logan and Ipswich. Many of the new residents have families with children aged from 7 to 17. Consistent with trends in the Greater Brisbane area many choose to live in single detached dwellings, particularly in the former Pine Rivers and Caboolture local government areas.

Although single detached dwellings make up the bulk of housing stock, the Redcliffe Peninsula provides the region with a greater proportion of higher density living options. Trends towards townhouse developments in other parts of the Region should lead to a greater diversity of housing choice than similar local government areas.

The conclusions drawn from the age profile are supported by household distribution in the region. Over 70% of our residents are part of either two parent families or they share a house with at least one other adult. Both of these groups tend to have more disposable income than singles living alone or single parent families, which is why housing prices are generally higher than equivalent local governments on the Greater Brisbane fringe.

The age and household structure tells Council that we need to deliver a wide range of infrastructure types such as parks, transport networks, community facilities, to meet the needs of the communities they service.

Residential gardens and street landscaping compliment an adjacent environmental corridor (Bellmere)

Plants and animals

More than three thousand plant, animal and fungi species have been recorded in Moreton Bay region. Of these, one hundred and eighteen are considered to be priority species.

A priority species is one that, for various reasons, deserves special attention. Priority species are important because their populations may be in decline due to pressures such as land use change and habitat destruction. Priority species are in need of monitoring particularly in terms of their population status and response to disturbance and environmental change.

The green infrastructure network identifies habitat for native plants and animals using a number of green components including core environmental areas, environment & waterways corridors, urban forest canopy and open space parkland.

Regional ecosystems

The region contains over one hundred thousand hectares of high-value vegetation and many more hectares of important urban forest canopy (including street, parkland and backyard trees), grassy fields (sports ovals and paddocks), roadside and urban wetland vegetation.

Sixty-three different regional ecosystems (plant communities) are identified, described and mapped in Moreton Bay Region. Of these, twenty-eight are poorly conserved, with five classified as endangered and twenty-three classified as 'of concern'[1]. Eighteen local plant communities have less than 50 hectares remaining in our region. These 'at risk' ecosystems are priorities for local conservation actions.

Waterways and wetlands

Three major waterways traverse the Moreton Bay region: The Stanley, Caboolture and Pine Rivers. Moreton Bay contains the largest part of the catchment of the Stanley River - which flows into the Somerset Dam. The Pine River and Caboolture River both flow into Moreton Bay.

A number of small creeks empty into the Pumicestone Passage catchment which lies between the mainland and Bribie Island.

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[1] *Vegetation Management Act 1999* (Qld)

Key issues for the region's green infrastructure network

Population growth and associated development is continuing to expand outwards from the urban centres putting pressure on the natural environment of the region. In areas of increasing population where the demand for urban and civic spaces is increasing, the reduction of private open space is likely to reduce important green values including urban forest canopy that provides benefits to our community and wildlife habitat extent.

Urban development typically requires more hard surfaces such as concrete and asphalt that readily absorb solar radiation, reducing heat reflectivity and creating hotter temperatures. This is known as the urban heat island effect. There are great opportunities for urban green infrastructure to play a key role in creating cool urban spaces with vibrant natural character and plenty of leafy shade.

Todds Road, Joyner

Green infrastructure needs to be designed into urban spaces and connection with the wider green infrastructure network needs to be maintained.

Ongoing recognition of local environmental values provides greater certainty for sustainable development and is necessary for strong economic growth and social wellbeing.

Beyond the community benefit of green infrastructure, a connected and diverse green infrastructure network will ensure a healthy environment that contributes to regional biodiversity and environmental resilience.

Regional Strengths

- The region is biologically diverse, providing habitat for coastal, lowland and mountain dwelling species and ecosystems.

- The region contains environmental and waterways corridors which help animals and seed to move and disperse through the landscape.

- Council has reasonably strong baseline data on the extent of high-value vegetation and native species.

Regional Opportunities

- Build the resilience of the natural environment to respond to environmental change.

- Grow environmental capital by investing in and valuing the region's ecological resources and biodiversity to ensure ongoing provision of services to the community.

- Develop local solutions to larger issues.

- Build strong partnerships with the community and other agencies through collaboration, cooperation, innovation and leadership.

- Ensure an integrated planning approach to managing growth and change.

Responding to user needs
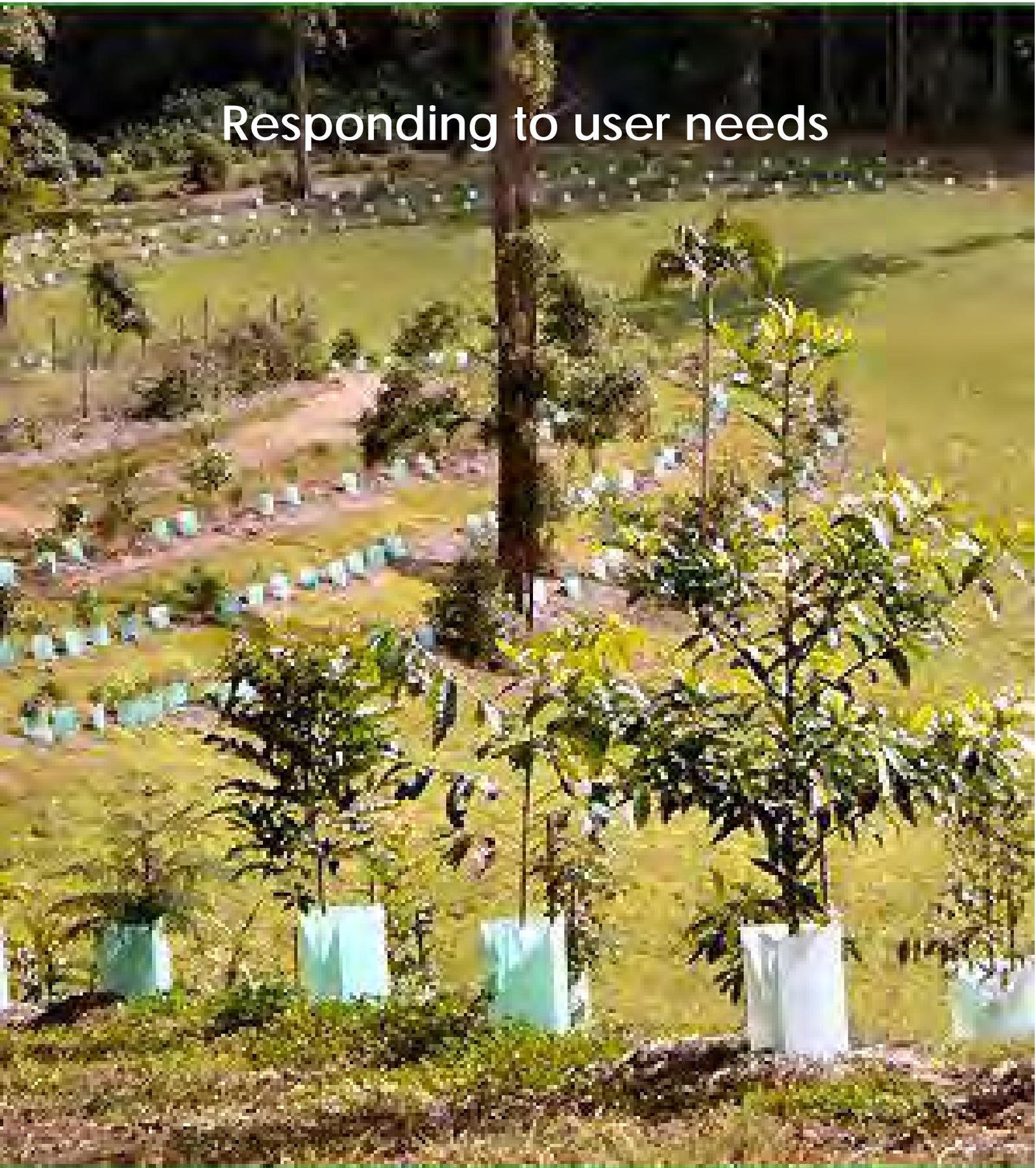
Responding to change

The natural environment is important for its biodiversity values and the ecosystem services it provides to our community. While excellent progress has been made towards protection of the natural environment in our region, biodiversity is still declining.

A major challenge for the Moreton Bay region is to maintain a healthy natural environment while allowing for meaningful connections between people and nature – particularly in urban areas.

Environmental Trends	Response	Green Infrastructure
Changes in land-use	MBRC Planning Scheme	✓
Vegetation clearing	Habitat conservation; ecological restoration;	✓
Biodiversity decline	Environmental offsets; ecological restoration	✓
Increased urban heat island	Street tree planting; innovative green design	✓
Habitat fragmentation	Wildlife movement infrastructure	✓
Inappropriate fire regimes	Fire Management Guidelines	-
Invasive plants and animals	Pest Management Plan	-
Changing aquatic environment & water flows	Water Sensitive Urban Design	✓
Motor vehicle strike (fauna)	Wildlife Movement Infrastructure	✓
Climate Change	Refer MBRC Climate Change 'Road Map'	✓

Strategic framework

The Strategic Framework is a component of the new MBRC Planning Scheme and states how Council intends to respond to growth and changing community needs. This document is a key consideration in the development of the Green Infrastructure Strategy.

The Moreton Bay Region Strategic Framework is the vision and strategy component of the new planning scheme for the Moreton Bay Region to accommodate growth and development to 2031.

The framework has been created using key values identified by Moreton Bay Region residents through the Community Plan. It considers our growing population, residential and economic precincts, as well as their influence on infrastructure, community services and the environment.

Moreton Bay
Regional Council

Planning Scheme

Green infrastructure and the place type approach

To support the delivery of a healthy and connected green infrastructure network, Council's strategic approach as outlined in its Strategic Framework is to use a planning framework known as the place type model. The place type model is a strategic planning tool that identifies a series of 13 different place type groupings throughout the region.

Council uses the place types to understand the green infrastructure needs within particular places. This information allows Council to plan and design for a green infrastructure network that features across all place types.

Examples of green infrastructure in place types:

Mountain Ranges, forests and waterways
Large core habitat areas and corridors of high ecological significance provide a high level of ecosystem services.

Rural areas
Forestry activities provide provisional environmental values; core habitat areas feature as a mosaic across the landscape, connected by environmental corridors.

Rural townships
Scattered but significant stands of native vegetation offers shelter and aesthetics for people, character to towns, and stepping stones for wildlife. Natural environment areas are complemented by private 'greening' of yard space on private property and street trees.

Key extractive resources
Buffer and separation areas provides core habitat and supports environmental corridors. Designed wetlands provide stormwater management solutions as well as green benefits.

Special areas
Open spaces, bushland fragments, street trees and even environmental offsets may feature depending on intensity and scale of special area activities.

Rural residential
Large allotments can support core habitat – particularly for koalas where large trees are retained in 'parkland' style settings.

Suburban neighbourhoods
Corridors and open spaces cater for both people and wildlife. Street trees and residential gardens link to corridors.

Next generation suburban neighbourhoods
Street trees and residential gardens offer habitat for urban dwelling wildlife, and provides aesthetics, shade and a cooler environment for residents.

Urban neighbourhoods
Urban design outcomes feature green assets such as water sensitive urban design, street tree boulevarding and complementary landscaping.

Activity centres
Vegetation provides shade, cools the local environment and features in urban design outcomes such as water sensitive urban design, street tree boulevarding and complementary landscaping.

Enterprise and employment areas
Large impervious areas benefit from street tree boulevarding, water sensitive urban design initiatives and waterway corridors to provide shade, cool the local area and offer aesthetics.

Coastal villages
Bushland tracts and wetland forests act as buffers to coastal hazards, while street trees and residential gardens contribute valuable green space.

Coast and river lands
Large swathes of significant environmental values including core habitat for koalas and shorebirds.

Connections with other infrastructure types

Open Space and Water Cycle Management

Open space, wetlands and waterway corridors are important components of the green infrastructure network for their recreational and environmental values. Environmental corridors not only support the movement of people between places, but support animal and plant movement, dispersal and refuge.

Most open space areas have some form of green infrastructure, ranging from bushland (natural) to stormwater treatment systems (semi-natural). Council provides facilities and activities on much of its open space; consideration for green infrastructure includes incorporation of natural elements and feature trees into park designs where appropriate.

Transport Corridors and Networks

Streets and roads support a variety of users from pedestrians, communities, cyclists, public transport and private cars. Green infrastructure can be integrated with streets and roads in the form of wildlife movement infrastructure, and roadside vegetation for aesthetics and a more pleasant micro-climate.

Active Transport

Human-powered movement, such as walking and cycling, is a healthy and sustainable transport choice. Green infrastructure supports active transport networks by providing ecosystem services such as shade, aesthetics, and even a cooler climate to move through.

Green infrastructure linkages, such as waterway and ecological corridors, support the movement of people between places, as well as animal and plant movement, dispersal and refuge.

Street tree providing character (Dayboro Hotel)

Opportunities for green infrastructure

Improving green infrastructure opportunities across our region will help build a connected and protected network of natural, semi-natural and engineered green assets to ensure a healthy and productive environment that is highly resilient to current and future threats.

A healthy and productive green infrastructure network will ensure numerous benefits *of green* infrastructure are provided to our community into the future.

Council is responding by increasing the integration of green infrastructure across the region using the following themes:

1. A network of green connections
2. Plants and animals
3. Habitats
4. Waterways & wetlands
5. Urban forest
6. Wildlife movement
7. Environmental offsets
8. Ecosystem services & Energy Efficiency

A program action plan will be developed in line with these themes.

We can plan for sustainable management, protection and conservation of the natural environment in the same way that we plan for development.

A network of green connections

Strong green connections are essential for a healthy and productive green infrastructure network. Environmental linkages and corridors allow animals, plants (seeds & pollen) and water to move across the landscape and they provide important habitats for animal foraging, socialising and resting.

Connecting people with the natural environment is equally as important, to foster environmental appreciation and understanding along with a sense of well-being and a feeling of belonging.

We will

- Connect people to nature through the provision of green infrastructure across Moreton Bay Region.

- Collaborate with the community to promote, strengthen and enhance green infrastructure across the region.

- Strengthen environmental corridors across the Moreton Bay Region by retaining and restoring connections between components of the green infrastructure network.

Land bridges promote safe wildlife movement through modified landscapes (SEQ)

Plants and animals

The Moreton Bay region is geographically located where subtropical biomes from the north meet temperate biomes from the south, resulting in spectacular diversity of plants and animal species living here. The region once supported an abundance of insects, reptiles, fish and aquatic animals, amphibians, birds and mammals. Around 757 native animal species have been recorded in Moreton Bay region. Those of conservation significance include the Richmond Bird-wing Butterfly, the Grey-headed Flying Fox, the Spotted-tailed Quoll and the koala.

A multitude of native plant species occur in Moreton Bay region. Native plants provide food and shelter for native animals and form unique communities which shape the region's diverse ecosystems. Approximately 2344 species of plants and fungi have been recorded here; and 30 of those are listed as endangered, vulnerable or near threatened.

We will

- Ensure that the location, design and delivery of green infrastructure benefits local native species.

Habitats

The Moreton Bay region forms part of a recognised biodiversity hot spot of significant habitats. The range of habitats in Moreton Bay region is significant and is reflected by the diversity of native species living here. From Bribie Island and the mainland coast to the mountains in the hinterlands, Moreton Bay region covers an array of habitats including sandy beaches, mangroves, tidal creeks and rivers, marshlands, brackish and freshwater swamps, lagoons, grasslands, woodlands, mountain and lowland sub-tropical rainforest, wet and dry eucalypt-dominant forest, rocky outcrops ecosystems and ecological transition zones.

We will

- Improve understanding and management of ecosystems within the region through ecological monitoring and health assessments.
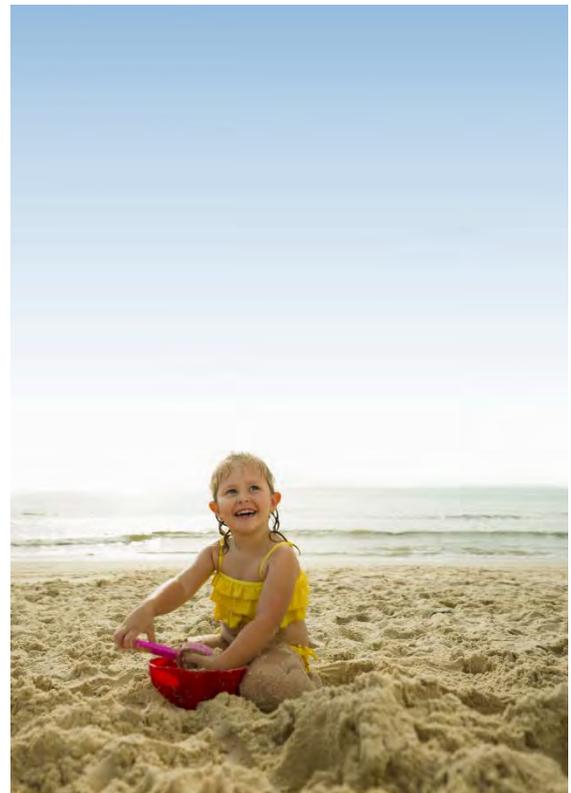
Waterways & wetlands

Vegetated buffer areas are required to our region's waterways and wetland to maintain and increase the health and resilience of these important areas.

We will

- Prioritise green infrastructure solutions to improve water quality and aquatic and riparian environments.

- Strengthen environmental corridors across Moreton Bay region.

Urban forest

Green infrastructure within the urban areas, such as individual character and habitat trees on private and public lands and street trees, will be incorporated into the design of development in a way that complements and supports the intended urban design outcomes relevant to the place and setting. Urban green infrastructure will allow for ongoing provision of ecosystem services to the community including conservation of urban biodiversity values.

We will

- Implement green infrastructure solutions that influence local microclimates and cool otherwise hot urban environs.

- Pursue energy-conscious urban design with green infrastructure.

Wildlife movement

Strong green connections without barriers allow animals to move across the landscape, interact naturally, share genes and in time adapt to changing environmental conditions. Opportunities for wildlife movement infrastructure placement will be investigated to reconnect key environmental areas to enable wildlife to safely move through both urban and rural areas.

We will

- Investigate, prioritise and implement solutions to improve wildlife movement across the landscape.

- Apply a scientific-evidence based approach to plan, design and deliver green infrastructure.

Environmental offsets

Where land has sensitive wildlife habitat and/or is located within planned wildlife corridors within the green infrastructure network, its highest and best use may be as biological open space. In areas designated for future growth, this has presented significant challenges for the retention of these environmentally important areas. However, the use of offsets, where environmental values are counterbalanced to an equivalent or better outcome, can help to maintain a long term balance of environmental values in the face of growth and associated vegetation clearing.

Advance offsets, where vegetation is planted prior to vegetation clearing and registered accordingly, may present economic advantage to the land owner. The ability to sell mitigation or conservation credits provides landowners with an incentive to develop their lands for conservation.

We will

- Support regional growth and build development confidence through flexible management of environmental values.

- Identify land suitable for receiving environmental offsets within the green infrastructure network.

- Initiate an advance offsets program to reduce the time lag between vegetation removal and regrowth to maturity.

- Prepare an inventory of land suitable for receiving offsets to help strengthen the green infrastructure network.

Ecosystem services

To ensure the benefits of green infrastructure continue to be offered to people, we need to ensure vegetation in its various forms is retained across the landscape. The underlying ecosystem functions need to be protected. For example, vegetation in environmental corridors that traverse suburbia improves air quality and local climate.

**We will**

- Invest in and support scientific research that improves our understanding of the green infrastructure network in the Moreton Bay Region.

- Promote understanding of the ecosystem services provided by green infrastructure.

- Deliver energy efficiency projects and support innovative and emerging energy efficiency technologies.
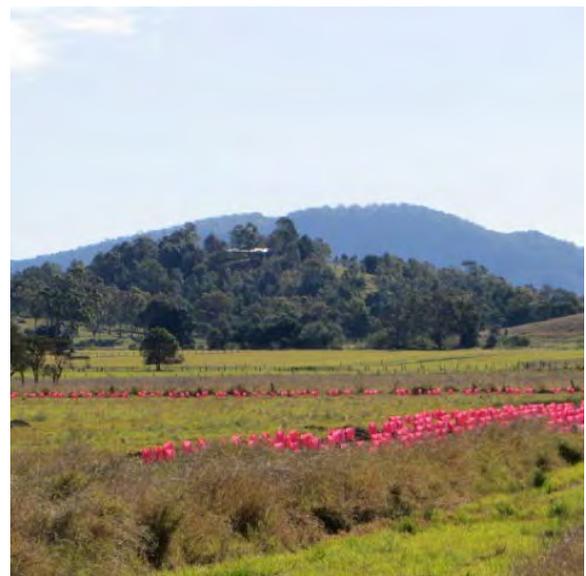
Revegetation area (Woodford)

Framework for Delivery
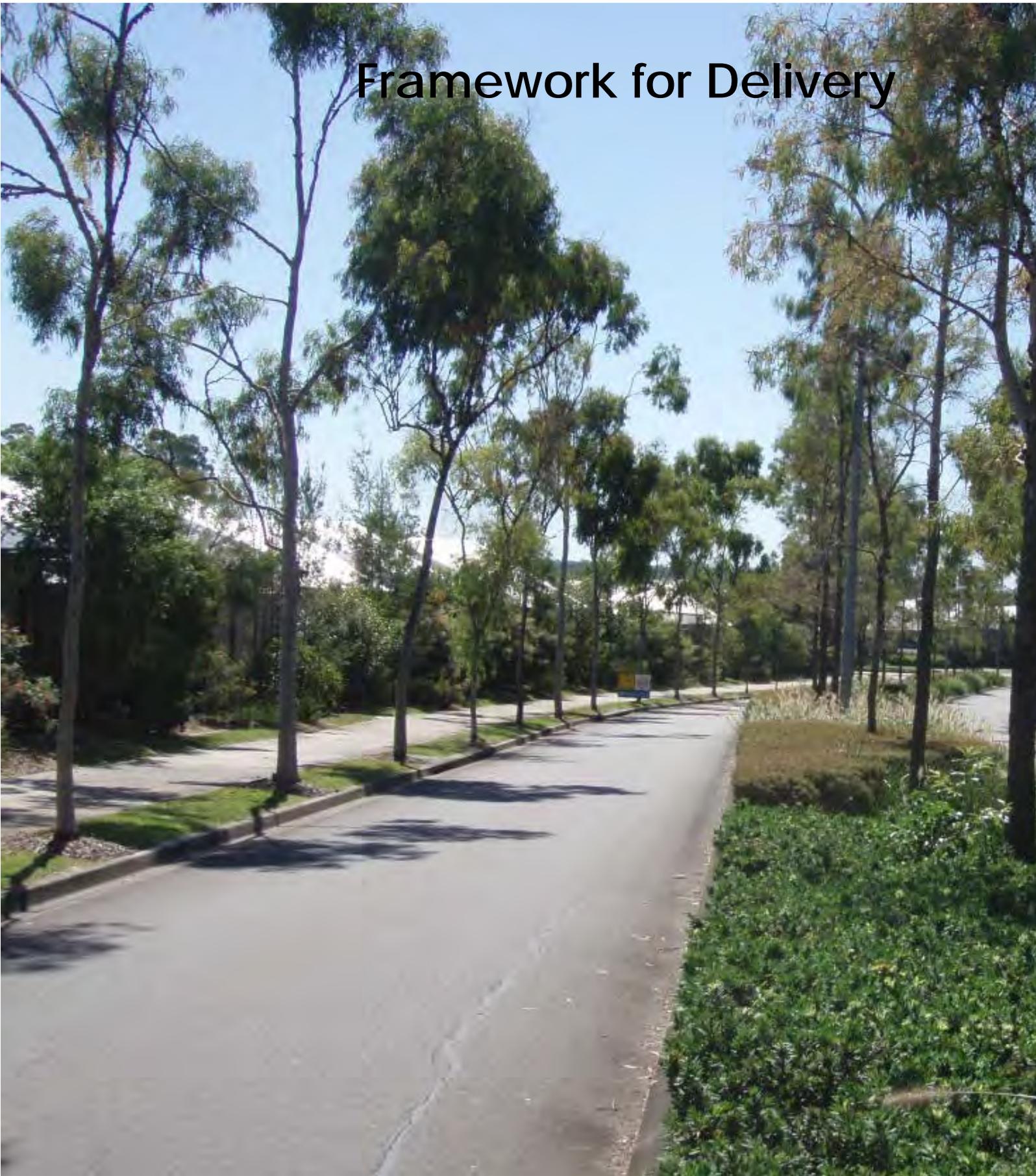
Delivering the strategy

Delivering the Strategy vision and responding to a changing environment in Moreton Bay region are the primary objectives of this Strategy. Council will integrate green infrastructure principles, programs and actions into its planning, design and construction processes, as well as through a series of programs with measurable targets and an ongoing monitoring and reviewing schedule.

The outcomes of this strategy will ultimately inform Council's Integrated Regional Infrastructure Strategy (iRIS), including the suite of iRIS strategies, Council's capital works program, other Council strategies (e.g. Climate Change Roadmap, Koala Conservation Strategy, etc.) the Moreton Bay Planning Scheme, and a range of other Council programs including community engagement initiatives, grants programs and other Council programs.

Leadership and Governance

Moreton Bay Regional Council will adopt the findings of this strategy and its action plan as policy. Council will champion the green infrastructure vision and will work to achieve the outcomes, actions and projects expressed within the strategy. The design and delivery of green infrastructure projects will apply the planning principles identified in section 2.

Council will capacity build within its corporate structure to facilitate quality planning and design outcomes that are reflective of the green infrastructure vision and respond to identified needs. Council's design process will focus upon cost effective outcomes to integrate green infrastructure into urban environments to ensure the benefits of green infrastructure are provided to our community into the future.

IRIS and Council's capital works program

Moreton Bay Regional Council performs a leading role in coordinating the delivery of infrastructure for existing and new communities throughout the region. To do this more efficiently, Council uses an integrated approach to infrastructure network planning.

The Integrated Regional Infrastructure Strategy or 'iRIS' combines Council's infrastructure priorities with the priorities of other infrastructure providers in the region such as Unitywater and Energex. iRIS will coordinate the planning, design and construction process for all infrastructure networks. This will assist Council in prioritising infrastructure projects based on a quadruple bottom line assessment that stimulates economic development, is socially equitable, environmentally robust and has a governance framework based on excellence and value for money.

The Green Infrastructure Strategy will inform the preparation of iRIS by identifying land acquisitions, land suitable for revegetation/receiving offsets, wildlife movement and habitat infrastructure, and street tree enhancement priorities.

The outcomes of iRIS will guide Council's capital works program for the next 20 years.

Moreton Bay Region Planning Scheme

The new planning scheme will help to respond and encourage growth and development across the region. The Green Infrastructure Strategy informs the development of the planning scheme with network mapping to trigger development assessment and design standards for green infrastructure.

The Corso, North Lakes (artist's impression)

Operational Programs

A range of green infrastructure programs will be undertaken, bringing together policy direction and planning contained in this strategy. These programs build on Council's current policies and programs and direct future priorities in green infrastructure planning and management. A full list of programs is contained in Appendices A.

Implementation

Council will establish a cross departmental working group to implement and monitor the strategy and action plan and ensure that the action plan is updated on an annual basis.
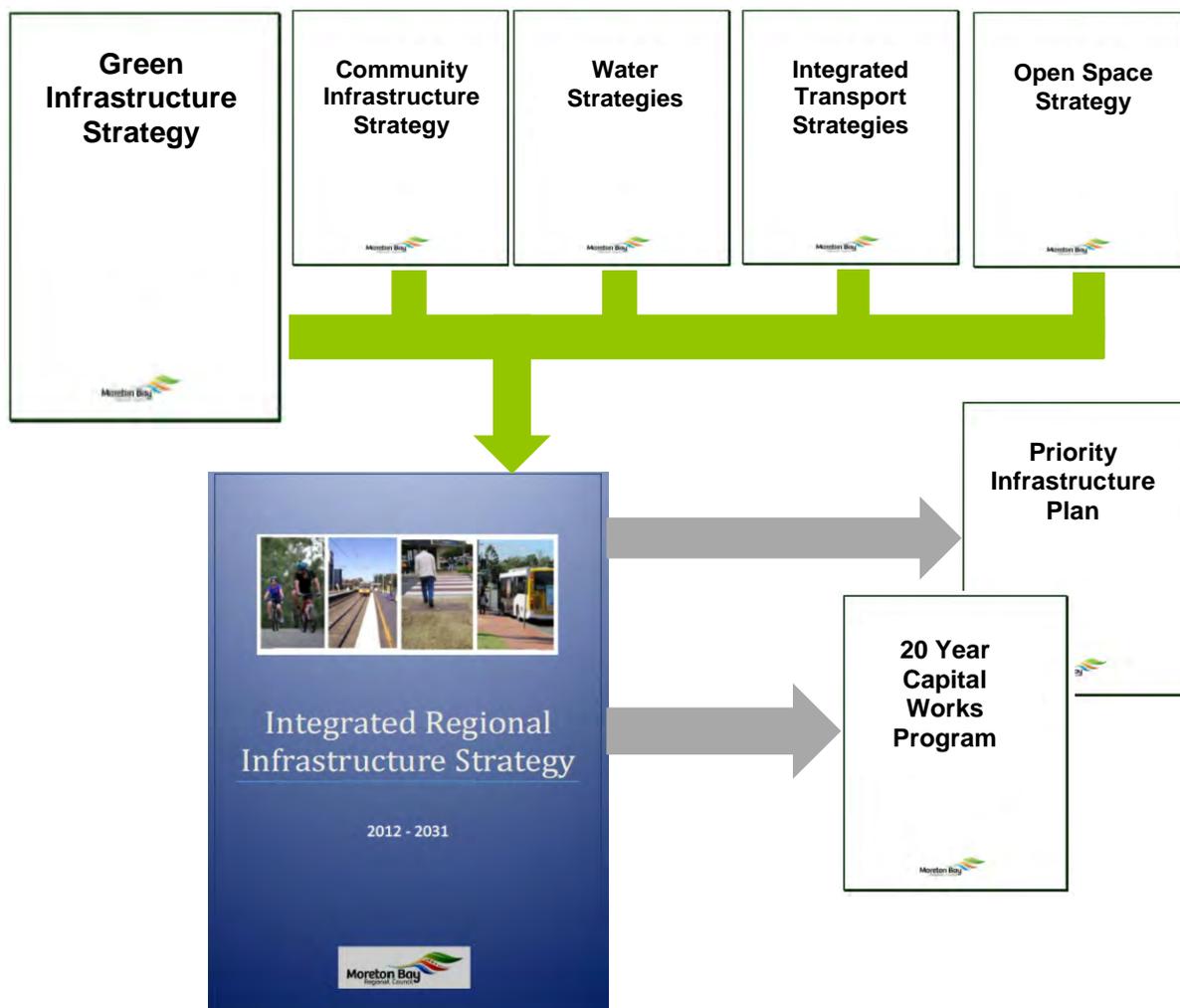
Monitoring and Review

To ensure we continue to meet the vision and actions proposed in this strategy, evaluation and monitoring will be undertaken. This will allow Council to continually monitor its progress, be responsive to legislative change and remain current.

Review	
Strategy Review (5 yearly)	Works and land acquistion review (annually)

Monitor
Monitor and refine strategy outputs as subsequent detailed strategies are completed to meet user needs
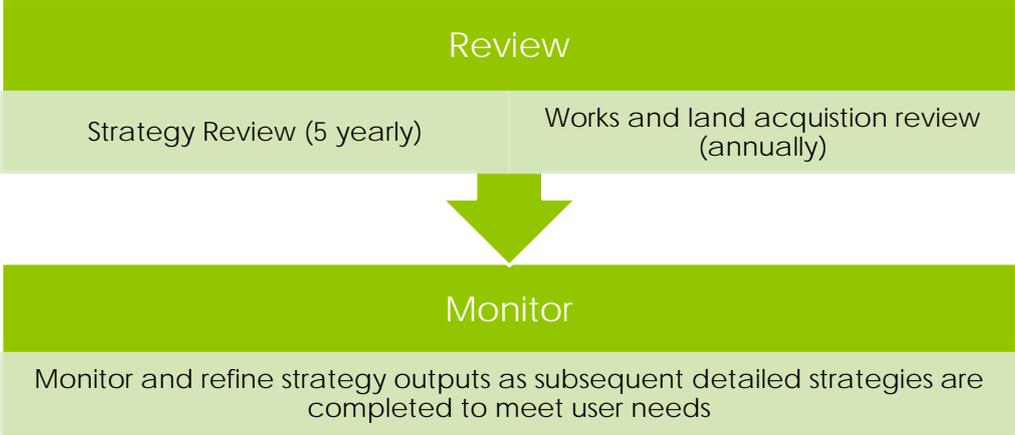
Regular monitoring of the strategy will be completed to ensure Council remains on track to achieve the vision of the green infrastructure strategy. Council will continually improve the planning, funding and provision of green infrastructure, and follow current best practice at all times.

Street trees provide a long term legacy of social and environmental values (SEQ).

Appendix A
Program Action Plan
Green Infrastructure Strategy 2012 – 2031

Program Action Plan

The Program Action Plan identifies actions to deliver the green infrastructure vision for the Moreton Bay region.

Timeframes

Short term: 1-2 years

Medium term: 3-4 years

Long term: 5+ years

Definitions

EP & C – Environmental Planning & Compliance Division

SPD – Strategic Planning and Development Division

ECM – Engineering, Construction and Maintenance Division

GIS – Geographical Information Systems Department

DW & CP – Drainage, Waterways & Coastal Planning Department

CS – Corporate Services

ED – Economic Development & Commercial Services

Green Infrastructure Strategy Themes

1. A network of green connections
2. Plants and animals
3. Habitats
4. Waterways & wetlands
5. Urban forest
6. Wildlife movement
7. Environmental offsets
8. Ecosystem services

A. A network of green connections

	Action	Purpose	Timeframe	Responsibility	Status
1.1	**Connecting people to nature through the provision of green infrastructure across Moreton Bay Region**				
1.1.1	Inform community engagement programs, projects and strategies.	To foster environmental appreciation and encourage environmental activity in the community.	Ongoing	EP & C	Ongoing
1.1.2	Promote the integration of green infrastructure into project planning, design and delivery of other infrastructure types.	To maximise the potential environmental benefits provided by new infrastructure - including through retrofit projects. To pursue cost efficiencies.	Ongoing	EP & C SP & D ECM	Ongoing
1.1.3	Maintain up-to-date green infrastructure information on Council's website.	To promote understanding of the range of services offered by green infrastructure.	Ongoing	EP & C	Ongoing
1.2	**Strengthen the environmental corridor network across Moreton Bay region through retention and restoration of connections**				
1.2.1	Incorporate any on-ground corridor realignments and changes to vegetation extent into the MBRC Planning Scheme.	To maintain mapping accuracy in line with approved development and infrastructure projects.	Ongoing	EP & C SP&D GIS	Not yet commenced
1.2.2	Identify and map the ten green infrastructure network components identified in the strategy.	To build and appropriately value the green infrastructure network maps and ensure their ongoing currency.	Medium	EP & C CS – GIS ECM	Underway
1.2.3	Identify and map local corridor linkages in addition to the MBRC Planning Scheme corridors.	For network effectiveness at the local scale by informing development design, infrastructure projects and community engagement efforts.	Short	EP & C CS – GIS ECM	Underway
1.2.4	Review the mapped green infrastructure network for gaps and document subsequent solutions for costing, budgeting and implementation on an annual basis.	To prioritise capital works / priority infrastructure plan, annual planning and budgets.	Ongoing	EP & C SP & D	Underway
1.2.5	Investigate and identify the movement needs of priority species of Moreton Bay Region to inform green infrastructure connectivity solutions.	To facilitate safe movement and dispersal of native animals and plants.	Short - Medium	EP&C ECM	Not yet commenced
1.2.6	Implement a green infrastructure network safety improvements program.	To improve multi-network integration, increase connectivity, provide safe and ongoing fauna movement opportunities and reduce wildlife-vehicle collisions.	Ongoing	ECM	Ongoing
1.2.7	Implement a green infrastructure network capacity upgrade program.	To improve multi-network integration, increase network connectivity, provide safe and ongoing fauna movement	Ongoing	ECM	Ongoing

		opportunities and increase habitat capacity of the network.			
1.3	**Collaborate with the community to promote, strengthen and enhance green infrastructure across the region**				
1.3.1	Strategically market Council's voluntary conservation programs to private landholders where private land connects and strengthens the green infrastructure network.	To support the sustainable management of green values at property and local landscape scales.	Ongoing	EP & C	Ongoing
1.3.2	Pursue collaborative partnerships with other levels of government and natural resource management organisations to discuss cross boundary environmental issues, partnership opportunities and external funding sources.	To remain up to date with environmental best management practice and to promote Moreton Bay's green infrastructure network.	Ongoing	EP & C EH CS	Ongoing
1.3.3	Lead by example to promote Moreton Bay region as a place supporting innovate green infrastructure outcomes to encourage energy efficiency through urban design.	To support direct action innovation practices which minimise environmental impacts and encourage smart technology.	Ongoing	EP & C SP & D EMC ED & CS	Ongoing

B. Plants and Animals					
	Action	**Purpose**	**Timeframe**	**Responsibility**	**Status**
2.1	**The location, design and delivery of green infrastructure benefits local native species**				
2.1.1	Identify priority species of the Moreton Bay Region and value their habitat in Council's planning scheme.	To appropriately value priority native species in Council planning scheme. To protect and build resilience of flora and fauna species.	Short	EP & C SP & D	Complete
2.1.2	Undertake an inventory of current guidance material for priority species habitat management, and develop additional material for high priority species where none exists.	To raise awareness of priority species and encourage best practice management of priority species habitat.	Medium	EP & C	Not yet commenced
2.1.3	Review and regularly update green infrastructure mapping, provisions and policy in Council's planning scheme.	Recognise and appropriately value all native species in Council planning instruments and processes. Protect and build resilience of native flora and fauna.	Ongoing	EP & C SP & D ECM	Ongoing
2.1.4	Implement an annual koala food and habitat tree planting program in association with relevant stakeholders.	To target habitat conservation for the koala and strengthening the green infrastructure network values for other	Ongoing	EP & C ECM	Underway

	priority species.				
2.1.5	Incorporate green infrastructure principles into the Integrated Design Manual for the MBRC planning scheme.	To promote development design solutions providing environmental benefits.	Short	EP & C SP & D ECM	Complete

C. Habitats					
	Action	**Purpose**	**Timeframe**	**Responsibility**	**Status**
3.1	**Improve understanding and management of ecosystems within our region through ecological monitoring and health assessments**				
3.1.1	Identify and value environmental areas and key habitat areas and corridors for priority species.	To target habitat conservation for priority species and ecosystems.	Short	EP & C	Complete
3.1.2	Determine priority council conservation reserves for inclusion in the protected area estate (to ensure long term protection and biodiversity resilience)	To appropriately value the range of ecosystems present in the region for biodiversity resilience into the future.	Medium	EP & C	Complete
3.1.3	Develop a reporting process to ensure that ecosystem health assessments (stream or terrestrial) inform management and planning decisions	To monitor the range of ecosystems present in the region for biodiversity resilience and inform green infrastructure priorities including offsets.	Medium	EP & C ECM	Not yet commenced
3.1.4	Ensure ecological communities are appropriately valued in Council's planning instruments.	To support local and regional biodiversity resilience into the future.	Short	EP & C SP & D	Complete
3.2	**Improve habitat for priority species**				
3.2.1	Investigate the feasibility of a nest box installation program as a priority species habitat and green infrastructure network connectivity solution, as well as a community engagement focus.	To strategically target priority species habitat conservation and foster environmental knowledge in the community.	Medium	EP & C	Not yet commenced

D. Waterways and Wetlands

Actions		Purpose	Timeframe	Responsibility	Status
4.1	**Prioritise green infrastructure solutions to improve water quality and aquatic and riparian environments**				
4.1.1	Prioritise riparian planting activities using an integrated approach considering green infrastructure, water management and open space needs.	To support meaningful and strategic rehabilitation of coastal, wetland and riparian vegetation.	Short	EP & C ECM - DW & CP SP & D	Underway
4.1.2	Ensure wetlands, waterways and coastal areas are valued in the MBRC planning scheme.	To protect and enhance the health of wetlands, waterways and coastal areas and reduce adverse impacts of inappropriate land use.	Short	EP & C	Complete
4.2	**Strengthen the environmental corridor network across Moreton Bay Region**				
4.2.1	Use local stream health targets to designate appropriate buffer widths to mapped waterway corridors (environmental corridors) as part of the regulated green infrastructure network.	To inform the green infrastructure network for the planning scheme.	Short	EP & C CS - GIS	Complete
4.2.2	Review the waterway corridor network and prioritise sections for re-naturalisation or softening where previously engineered.	To improve aquatic and riparian habitats and water quality.	Medium – Long	EP & C ECM - DW & CP SP & C	Not yet commenced

E. Wildlife Movement

Actions		Purpose	Timeframe	Responsibility	Status
5.1	**Improve wildlife movement across the landscape**				
5.1.1	Identify and prioritise land which can accommodate 'stepping stone' connectivity plantings to help reconnect fragmented areas of the green infrastructure network.	To reduce barriers to species dispersal and recruitment through protection and enhancement of environmental areas and wildlife movement corridors.	Medium	EP & C	Not yet commenced
5.2	**Apply a scientific-evidence based approach to plan, design and deliver green infrastructure**				
5.2.1	Research and evaluate wildlife movement infrastructure types to inform site appropriate selection and installation.	To promote the selection of appropriate green infrastructure to align with required environmental outcomes and budget allowances.	Short	EP & C	Not yet commenced
5.2.2	Apply a science-based methodology for identifying and prioritising wildlife movement infrastructure to inform new projects or	To enable a prioritisation process for wildlife movement infrastructure installation. To facilitate safer wildlife	Short	EP & C	Not yet commenced

	Actions	Purpose	Timeframe	Responsibility	Status
	retrofits.	movement across roads at wildlife crossing hotspots, thereby reducing the risk to both fauna and motorists.			
5.2.3	Work with internal departments to improve green infrastructure outcomes in balance with other infrastructure types.	To improve integration of green infrastructure into engineering designs prepared for Council projects.	Short	EP & C	Not yet commenced
5.2.4	Develop standard drawings and images for the Integrated Design Manual for the MBRC planning scheme that guide linear infrastructure projects on including wildlife movement infrastructure.	To promote innovative development and infrastructure designs that minimise adverse impacts on biodiversity.	Short	EP & C SP & C	Underway
5.2.5	Document the methodology for planning, designing and mapping the MBRC Green Infrastructure Network and develop a green asset inventory consistent with Council's current asset registration processes.	To promote scientific and evidence based approach to environmental network development and pursue internal process efficiencies.	Short	EP & C CS - GIS	Underway
5.2.6	Investigate and trial new and/or under used low maintenance plant species for use in urban landscapes.	Promote the use of local species. Support new markets for horticultural industry	Short		Not yet commenced

F. Urban Forest					
Actions		**Purpose**	**Timeframe**	**Responsibility**	**Status**
6.1	**Implement green infrastructure solutions that influence local microclimates and cool otherwise hot urban environs**				
6.1.1	Prioritise green infrastructure projects in the urban footprint as an urban heat island solution.	To mitigate heat impact in urban areas with high urban heat island ratings.	Medium	EP & C ECM	Not yet commenced
6.1.2	Map the urban heat island potential across the urban place types.	To identify hot spots for green infrastructure retrofits benefitting the community.	Short	EP & C	Commenced
6.1.3	Prioritise hot locations for green infrastructure landscaping treatments.	To cool microclimates and encourage use of active transport networks.			Not yet commenced.
6.2	**Improve current levels of urban green infrastructure**				
6.2.1	Prioritise key urban areas for green infrastructure retrofits that will lead to improved provision of ecosystem services.	To improve biodiversity in urban areas through retention of vegetation, landscaping with native species and enhanced green infrastructure.	Medium	EP & C ECM SP & D	Not yet commenced

| 6.2.2 | Initiate a program for planting trees in urban locations. | To mitigate council's carbon footprint and increase the service extent of the urban forest and create more shade. | Medium | ECM | Not yet commenced |

G. Environmental Offsets

Actions		Purpose	Timeframe	Responsibility	Status
7.1	**Support regional growth and build development confidence through flexible management of environmental values.**				
7.1.1	Develop environmental offset requirements, mapping and policy for the MBRC planning scheme.	To counterbalance lost environmental values including priority species habitat. To guide offset placement benefiting the green infrastructure network	Short - Medium	EP & C	Ongoing
7.1.2	Develop a Council environmental offsets policy directive to ensure environmental offsets involving Council projects and activities, including advanced offsets, are managed strategically, consistently and effectively.	To provide direction for Council officers when managing and delivering environmental offsets including through a future advance offset program.	Short	EP & C ECM	Underway
7.1.3	Investigate and document alternative offset actions to counterbalance the loss of environmental values.	To promote the flexible nature of green infrastructure solutions.	Short - Medium	EP & C ECM	Not yet commenced
7.2	**Identify land suitable for receiving environmental offsets within the green infrastructure network**				
7.2.1	Undertake an offsets demand analysis in line with the MBRC planning scheme to understand the sequencing of development that will inform the sequencing of offsets, Document and include as an appendices of the Green Infrastructure Strategy.	To inform land investment opportunity.	Medium	EP&C ECM	Underway
7.2.2	Work together with relevant agencies and offset brokers to align state, regional and local offset delivery priorities	To align locally preferred offset investment areas and opportunities with regional and state priorities.	Short	EP & C CS - GIS	Underway
7.3	**Initiate an advance offsets program to reduce the time lag between vegetation removal and regrowth to maturity**				
7.3.1	Develop and establish an advanced offset program, planting on parcels strategically located within the green infrastructure network.	To reduce the time lag between approved vegetation clearing, and the growth of newly planted trees.	Short		Underway
7.3.2	Encourage initiatives that contribute to the success of the advanced offset program,	To facilitate a rolling acquisition and planting program in strategic locations	Short - Medium		Not yet commenced

	such as financial offset contributions from private development, and revegetation opportunities from external organisations e.g. planting to offset carbon emissions.	within the green infrastructure network.			
7.3.3	Complete offset strategies for all local and structure plan areas featuring in the MBRC planning scheme.	To facilitate intended development and green infrastructure outcomes in locally planned areas.	Short	EP & C	Underway
7.4	**Prepare an inventory of land suitable for receiving offsets to help strengthen the green infrastructure network**				
7.4.1	Produce a database of preferred areas for receiving offsets and document potential receiving values.	To improve efficiency when searching for land suitable for receiving offsets.	Short	EP & C ED & CS	Underway

H. Ecosystem Services					
	Action	**Purpose**	**Timeframe**	**Responsibility**	**Status**
8.1	**Improve our understanding of the green infrastructure network in the Moreton Bay region**				
8.1.1	Identify and map areas supplying high levels of ecosystem services in Moreton Bay Region.	To ensure the ecosystem functions of the region are identified in a way that can be considered in Council's decision making processes.	Short	EP & C CS - GIS	Complete
8.1.2	Support scientific research improving the understanding of how the green infrastructure network functions at multiple scales.	To improve knowledge and inform decision making processes.	Medium – Long	EP & C SP & D	Ongoing
8.2	**Promote understanding of the ecosystem services provided by green infrastructure**				
8.2.1	Consider areas supplying high levels of ecosystem services in development of green infrastructure network mapping for the MBRC planning scheme.	To ensure mapped ecosystem functions of the region are appropriately valued in the planning scheme.	Short	EP & C SP & D	Complete
8.2.2	Investigate opportunities to promote the understanding of ecosystem services throughout Council and the community.	To increase the understanding of the ecosystem services provided by green infrastructure and how these contribute to community wellbeing.	Ongoing	EP & C	Ongoing
8.3	**Energy Efficiency**				
8.2.3	Consolidate Council's commitment to plan and manage organisational energy use and ensure energy efficiency is embedded as a 'business as usual' approach in all organisational activities.	To progressively improve energy performance across the organisation. In doing so, Council will lead the community by example.	Ongoing	MBRC	Ongoing

8.2.4	Identify and capitalise on energy efficiency opportunities through increased use of efficient technologies, renewable energy alternatives and energy-conscious urban design and green architecture.	Support innovative and emerging energy efficiency technologies including green urban design.	Ongoing	MBRC	Ongoing