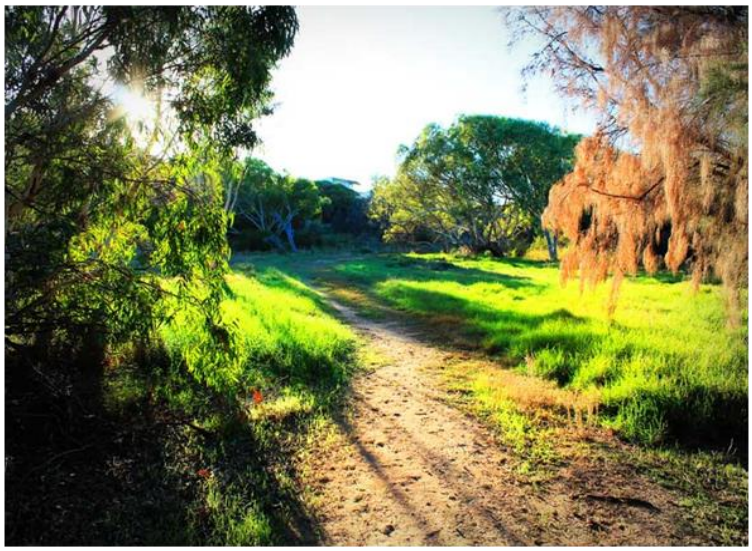
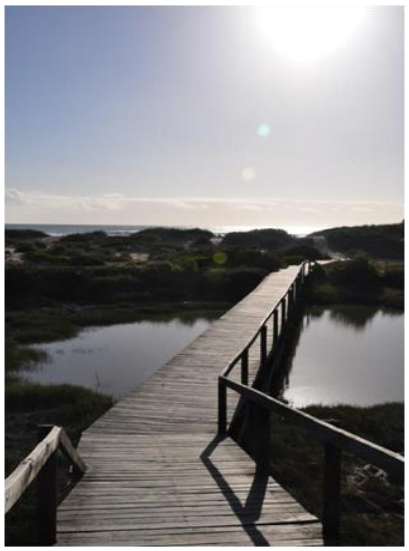
SHIRE OF IRWIN
DONGARA-PORT DENISON
A BRILLIANT BLEND

Green Infrastructure Strategy 2015 – 2020

Planning & Infrastructure Services







The Shire of Irwin is grateful for and acknowledges the advice and support of its partners in the development of the Green Infrastructure Strategy, incuding the Tidy Towns Sustainable Committee, the Northern Agricultural Catchments Council, and the Western Australian Local Government Association. We look forward to working together to implement the strategy's Action Plan, and to update and develop the strategy over the next five years.

The Shire would also like to acknowledge the advice and support of the Department of Water, and will continue to utilise their guidance.

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INTRODUCTION

The Shire's Dongara - Port Denison District Structure Plan identifies the need to develop a Green Infrastructure Strategy. Green Infrastructure describes the network of green spaces and water systems that deliver multiple environmental, economic and social values and benefits. Over the next five years the strategy will lead to an improved integrated network of multifunctional green spaces and corridors underpinned by easily maintained, economically and environmentally sustainable engineering solutions. The strategy will ensure that the Shire leads by example by reducing water and energy consumption, and by implementing efficient and innovative systems, projects and initiatives. In doing so, we can encourage our community and businesses to reduce water and energy consumption.



POLICY REVIEW



A Review of the Shire's strategies identifies the need to improve the quality of natural and built environments; improve the way we manage our green networks; and improve our approach to sustainability. The following Shire documents were reviewed:

- Strategic Community Plan;
- Dongara - Port Denison District Structure Plan;
- Open Space Strategy;
- Foreshore Management Plan;
- Town Centre Revitalisation Plan;
- Irwin River Estuary Coastal Management Plan;
- Bike Plan; and
- Liveable Neighbourhoods.

The following documents were also reviewed to provide a wider perspective of Green Infrastructure issues:

- The City of Vincent's Greening Plan and Public Open Space (POS) Zoning 2014 - http://www.vincent.wa.gov.au/Services/Environment_Sustainability/Green_Initiatives/Vincent_Greening_Plan;
- Australian Institute of Landscape Architect's Policy: Adapting to Climate Change - Green Infrastructure 2009 - http://www.greeninfrastructure.org.au/docs/AILA_green%20infrastructure.pdf;
- Moreton Bay Regional Council's Green Infrastructure Strategy 2014 - https://www.moretonbay.qld.gov.au/uploadedFiles/moretonbay/development/planning/Draft-Green-Infrastructure-Strategy.pdf;
- The Shire of Esperance's Green Infrastructure Guidelines 2011 - http://www.esperance.wa.gov.au/cproot/1272/3/Green%20Infrastructure%20Guidelines.pdf;
- The City of Busselton's Shire of Busselton Corporate Energy Action Plan 2010 - http://www.busselton.wa.gov.au/sites/busselton.wa.gov.au/files/Shire%20of%20Busselton%20Corporate%20Energy%20Action%20Plan.pdf;
- The USA's Environmental Protection Agency's: Green Infrastructure in Arid and Semi-Arid Climates Report 2010 - http://www.icleiusa.org/action-center/tools/EPA_Arid_Climate.pdf.

The review of the wider Green Infrastructure literature suggests that a strategic approach can guide a wide variety of public sector, private sector and community-led projects and initiatives to improve the management of a wide variety of infrastructure, including:

- street trees and verge plantings;
- improvements to public open space (parks) and other green spaces;
- community gardens and horticultural areas;
- sustainable building design principles;
- recycling programs;
- wind farms, solar farms and wave power; and
- water resources and desalination systems.
- sustainable drainage systems incorporating the principles of Water Sensitive Urban Design (WSUD);
- connections, including roads, verges, footpaths, cycle ways, water courses and other wildlife corridors;

OPPORTUNITIES

Green Infrastructure Opportunities

The Shire's Strategic Community Plan (SCP) shares the visions and aspirations for the future and outlines how the Shire will, over the long term, work towards a brighter future for the Irwin community. The rest of this section demonstrates how Green Infrastructure can support the four objectives of the SCP and draws out the key issues and opportunities.



SCP Objective 1:
A prosperous, diverse and thriving economy

A coordinated approach to Green Infrastructure can support SCP Objective 1 by:

- improving property values, including house prices, due to the close proximity of development to attractive green spaces and sustainable energy sources;
- saving money for residents, local businesses and the Shire through initiatives to save energy and rationalisation of public open spaces by managing water better, and eco-zoning and hydro-zoning areas;
- enabling the Shire to develop policies and guidelines that help developers maximise the potential of their sites by combining open space and WSUD to improve development viability and saleability;
- improving the area's image and sense of place to attract investment, new businesses and residents; and
- developing and maintaining infrastructure in more environmentally and financially sustainable ways.

SCP Objective 2:
To respect and understand our natural and built environment and conserve our heritage

A coordinated approach to Green Infrastructure can support SCP Objective 2 by:

- utilising WSUD principles to reduce pollution and increase groundwater recharge;
- preventing the fragmentation of wildlife habitats and improve linkages to existing habitats or natural features, to allow species movement;
- encouraging diverse habitats to be created which are rich in flora and fauna;
- encouraging active lifestyles that reduce car use and carbon footprints to mitigate adverse environmental impacts;
- increasing vegetation cover in key areas to reduce the urban heat island effect; and
- identifying opportunities to improve key landscapes and public buildings in sustainable ways, while conserving our heritage assets.

SCP Objective 3:
A collaborative and forward looking community that is guided by strong leadership

A coordinated approach to Green Infrastructure can support SCP Objective 4 by:

- informing and engaging with the community, and enabling them to drive projects and initiatives;
- improving the Shire's governance of green spaces and other assets in financially sustainable ways;
- developing a stable attractive environment, encouraging an invigorated community and improving regional partnerships with government and industry; and
- providing a Green Infrastructure Strategy that is used to lobby for improved services and to attract public and private sector investment.





SCP Objective 4:
A friendly, safe and engaged community enjoying a quality lifestyle and a diverse range of services, programs and facilities

A coordinated approach to Green Infrastructure can support SCP Objective 3 by:

- improving physical connections between green spaces to encourage movement get between them;
- encouraging healthy active lifestyles by improving people's enjoyment of high quality natural and built environments;
- improving green spaces for socialising, interaction, events, exercise and physical activity;
- beautifying areas, calming traffic, reducing car use to improve the liveability of places;
- creating more opportunities and places for children to play and learn;
- identifying spaces for practising and promoting, horticultural skills, providing opportunities for growing food locally and healthy eating;
- improving mental well-being by providing access to nature and attractive green spaces and breathing spaces;
- creating opportunities for community participation and volunteering to manage green spaces and connections; and
- improving ecosystems and the services they provide that are essential for human health survival, including water filtration, maintenance of soil fertility, pollination, pest control, and cultural and spiritual fulfilment.



THE STRATEGY

Vision

The Shire of Irwin is underpinned by an infrastructure framework that supports a healthy environment and enables our community and economy to grow in sustainable ways.

Aims

The strategic aims are to:

1. improve the quality of life for our community, develop existing and new partnerships, and make the Shire a more attractive place to live, work, play and visit, while respecting indigenous and heritage values;
2. provide easily maintained, economically and environmentally sustainable engineering solutions for parks, gardens, roads, footpaths/cycleways, verges, and other natural and semi natural green spaces;
3. develop an integrated network of multifunctional green spaces connected by footpaths and cycleways that enhance our sense of place, and cultural identity, and encourage active use by our community;
4. enrich biodiversity by restoring and providing interconnected green networks and habitats for wildlife with a focus on native species;
5. implement Green Infrastructure to mitigate the impacts of climate change and cool urban areas;
6. lead by example by reducing water and energy consumption and utilising sustainable energy sources (solar, wind etc);
7. encourage investment from the public and private sector and guide the development of new residential, commercial and industrial subdivisions; and
8. prioritise, develop and begin to implement Green Infrastructure projects and initiatives and accurately target resources.

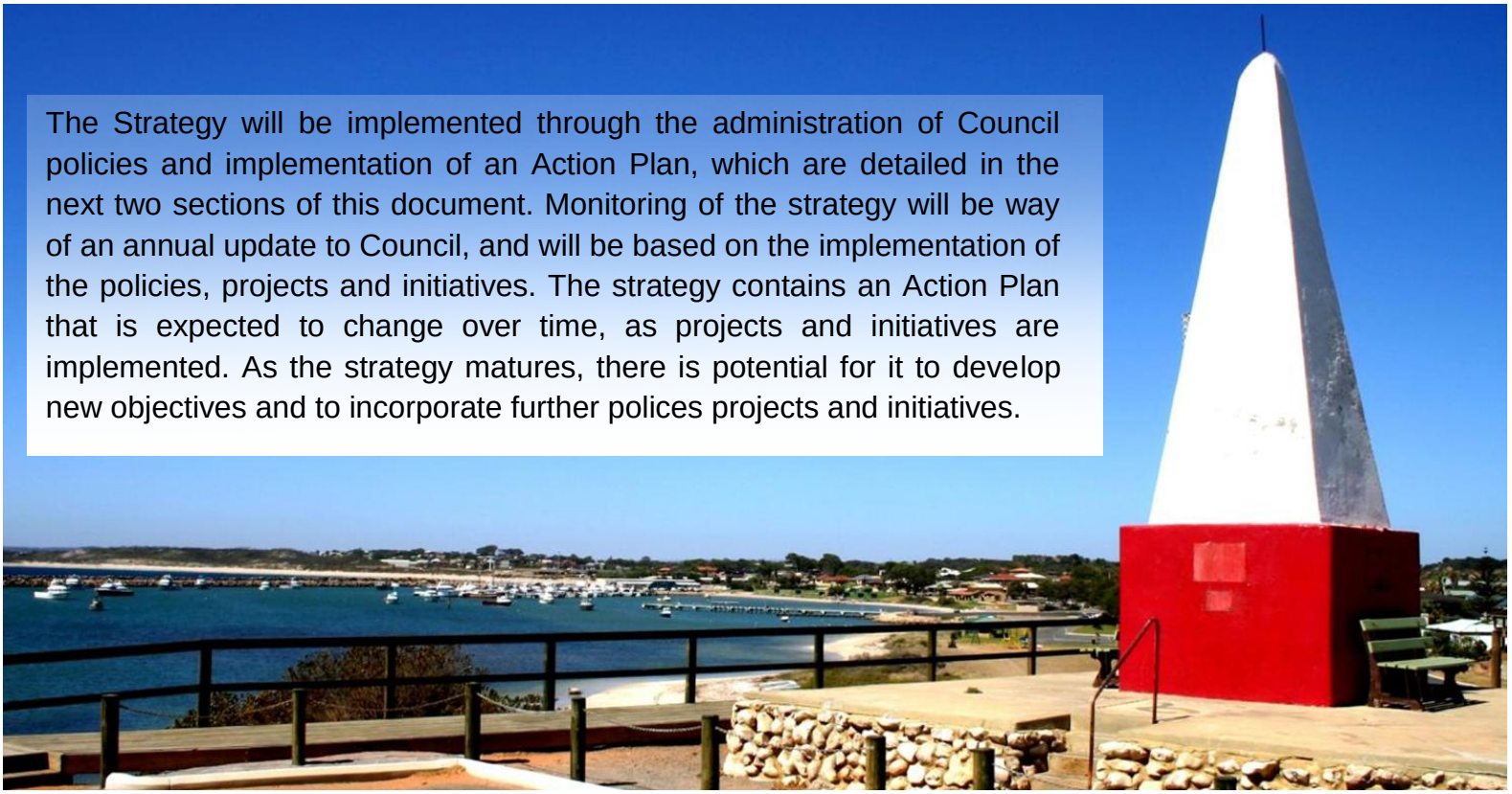




Objectives

1. To improve our sense of place and to enhance the green network and access throughout by:
   - **a.** Improving the quality of open spaces to better meet the needs our community;
   - **b.** Improving the natural qualities of public open spaces; and
   - **c.** Improving the quality of access routes and enhancing connectivity within our green network.
2. To improve the level of active community participation in the planning and development of the green network by supporting community groups to plan and implement projects, including test projects.
3. To enrich the biodiversity of the green network by:
   - **a.** Improving the quality of natural, semi-natural and man-made environments;
   - **b.** Improving the network of habitats and connectivity between them;
   - **c.** Conserve protected species and their habitats.
4. To ensure that infrastructure projects positively contribute to the green network, through compliance with the Shire of Irwin's:
   - **a.** Street Tree and Verge Treatment Policy;
   - **b.** Public Open Space Policy; and
   - **c.** Land Development Design and Construction Criteria.

The Strategy will be implemented through the administration of Council policies and implementation of an Action Plan, which are detailed in the next two sections of this document. Monitoring of the strategy will be way of an annual update to Council, and will be based on the implementation of the policies, projects and initiatives. The strategy contains an Action Plan that is expected to change over time, as projects and initiatives are implemented. As the strategy matures, there is potential for it to develop new objectives and to incorporate further polices projects and initiatives.



THE POLICIES

The policies detailed below provide guidance for implementing projects, initiatives and developments.



Council Policy for Street Trees and Verge Treatment

Purpose
To provide direction for plantings in the Shire's streets and verges.

Objective
To ensure that planting and other works are carried out in accordance with the vision, aims and objectives of the Green Infrastructure Strategy.

Requirements for projects
Each project must submit the following details for consultation with the Shire's Planning & Infrastructure Services, prior to Shire approval:

1. **Site Plan**, showing the site location, location of proposed plantings, list of species to be planted and technical details as necessary; and
2. **Project description** that briefly:
   - **a.** demonstrates consistency with the Green Infrastructure Strategy's aims and objectives through the project's: contribution to sense of place/community, relationship with adjoining land, rationale for species, water conservation and rainwater harvesting technique(s);
   - **b.** explains the required works, planting, mulching, actions/responsibilities; and
   - **c.** explains the expected ongoing maintenance requirements.







Consideration of projects

The Shire's Planning & Infrastructure Services will consider each project on its merits in terms of consistency with the Green Infrastructure Strategy's aims and objectives and potential impacts on: visual amenity, services, public safety and Council's other policies (e.g. Verge Treatment policy), plans and strategies. When considering projects, the Shire will generally prefer the use of native species, where appropriate. However, it is understood that in some locations, particularly in semi-natural and man-made environments, the use of non-native species may be more appropriate. As such, the species in the following table provides guidance towards the Shire's preferred species. Proposals can also include plants form the popular Trees and Shrubs of the Midlands and Northern Wheatbelt (Wilcox et al. 1997) or from the Water Corporations 'Waterwise Plant Search'. The planting of recognised weeds will not be supported.

Native Australian Street Trees	Non-native Street Trees
▪ Dongara Mallee *(Eucalyptus dongarensis)*	▪ Poinciana (*Delonix regia*)
▪ Illyarrie (*Eucalyptus erythrocorys*)	▪ Orchid Tree (*Bauhinia blakeana*)
▪ Rottnest Island Teatree (*Melaleuca lanceolata*)	▪ Chinese Elm (*Ulmus parvifolia*)
▪ Port Jackson Fig (*Ficus rubiginosa).*	▪ Crimson Sentry (*Acer platanoides)*
▪ Moreton Bay Fig (*Ficus macrophylla)*	▪ Field Maple (*Acer campestre)*
▪ Callistemon (*Kings Park special*)	▪ Jacaranda (various)
▪ Swamp She Oak *(Casurina glauca*)	
▪ WA Peppermint (*Agonis flexuosa*)	
▪ Bottlebrush *(Callistemon)*	
▪ Norfolk Island Pine (*Araucaria heterophylla*)	

Locations of Trees by type	
Open spaces in the Town Centre, Moreton Bay Estate, Ocean Drive and Northshore	Moreton Bay Fig, Port Jackson Fig
South Beach	Rottnest Island Tree, Coast She-oak
Flanagan Way, Pickering Drive, Retreat , Waldeck Street, Church Street	WA Peppermint

Ground Cover

Coastal Pigface (*Carpobrotus virescens*); Coastal Daisy Bush (*Olearia axillaris);* Coastal Rosemary (*Westringia fruticosa);* Glow Wattle (*Acacia lasiocarpa);* Creeping Boobialla (*Myoporum parvifolium);* Silverbush (*Convolvulus cneorum);* Orange Jessamine (*Murraya paniculata).*

Note: New street trees should maintain the following minimum setbacks: 20m from an intersection, 5m from a crossover, 5m from public utility boxes, 3.25m from neighbouring lot boundaries and 3.2m from the back edge of a kerb.

Council Policy for Existing Public Open Space

Purpose
To improve the Shire's green network by enhancing the natural qualities of public open spaces, enriching biodiversity, rationalising water use and maintaining high quality spaces for public use.

Objectives

1. To rationalise the Shire's public open space reserves to reduce ground water use, while still maintaining high quality facilities, by developing projects for each site;
2. To reduce the need to use large volumes of water on existing turfed areas by converting them to native garden areas; and
3. To reduce the occurrence of overwatering by grouping types of vegetation into categories with similar water requirements.

Requirements for projects aimed at rationalising existing POS
Each project must submit the following details for consultation with the Shire's Planning & Infrastructure Services, prior to Shire approval:

1. **Site Plan**, showing the site location, location of proposed plantings, list of species to be planted and technical details as necessary; and
2. **Project description** that briefly:
   - **a.** demonstrates consistency with the Green Infrastructure Strategy's aims and objectives through the project's: contribution to sense of place/community, relationship with adjoining land, rationale for species, water conservation and rainwater harvesting technique(s);
   - **b.** explains the required works, planting, mulching, actions/responsibilities; and
   - **c.** explains the expected ongoing maintenance requirements.

Consideration of Projects
The Shire's Planning & Infrastructure Services will consider each project on its merits in terms of consistency with the Green Infrastructure Strategy's aims and objectives and potential impacts on: visual amenity, services, public safety and Council's other policies, plans and strategies. When considering projects, the Shire will generally prefer the use of native trees, shrubs and other plants, where appropriate.

Water Conservation Requirements
Each area of public open space must meet the following requirements:

Type of POS	Max volume of water per year
High use, high profile	10,000 kl/ha/yr
Low use, high profile	7,500 kl/ha/yr
Low use, low profile	6,000 kl/ha/yr
Dry areas of POS, parks and bush	0 kl/ha/yr

The above Council policies will be incorporated into the Council Policy Manual, available on the Shire's website www.irwin.wa.gov.au.

Local Planning Policy No. 3 - Water Sensitive Urban Design

Purpose

To ensure that proponents undertaking subdivision and development proposals effectively manage stormwater in accordance with Water Sensitive Urban Design principles.

Objective

To ensure Water Sensitive Urban Design principles are implemented in subdivisions and development, and ensure stormwater is adequately managed through integrated land and water planning.

Policy Provisions

1. Where necessary and at the discretion of the Shire of Irwin, Urban Water Management Plans may be required as a condition of planning approval, and may also be required for assessing Local Area Plans and rezoning proposals.

2. Local Water Management Plans are required for Local Structure Plans, and may be required for rezoning proposals, at the discretion of the Shire of Irwin.

3. All subdivisions and development must minimise peak stormwater flows, and wherever possible ensure the 1 in 1 year, 1 hour average recurrence interval (ARI) storm event is detained and treated on site.



4. All subdivisions and development must minimise the exporting of nutrients and other pollutants from subdivision and development sites on downstream waterways, and shall comply with the best practice performance objectives for suspended solids, total phosphorus and total nitrogen by meeting the following standards:
    - Suspended Solids - 80% retention of typical urban annual load
    - Total Nitrogen - 45% retention of typical urban annual load
    - Total Phosphorus - 60% retention of typical urban annual load
    - Litter - 70% reduction of typical urban annual load

5. All subdivisions and development must ensure that post development stormwater infiltration and run-off rates have no more of an off-site impact than pre-development run-off rates.

6. Where possible and at the discretion of the Shire of Irwin, all subdivisions and development must use the following measures to improve the quality and reduce the flow of water discharged to waterways:
    - vegetated swales, buffer strips and rain gardens;
    - collection and reuse of rainwater and stormwater on site;
    - multiple uses of water within a single manufacturing site;
    - direction of flow from impervious ground surfaces to landscaped areas;
    - installation of water recycling systems;
    - the use of litter traps for development with the potential to generate significant amounts of litter; and
    - appropriately designed waste enclosures and storage bins.

Policy Guidance

1. Prior to submission of Urban/Local Water Management Plans Developers are encouraged to seek advice from the Shire of Irwin's Planning Services and the State Government's Department of Water.
2. Where stormwater cannot be retained on site in major rainfall events, an application may be made for connection to the Shire of Irwin's stormwater disposal system, where there is sufficient capacity. Alternatively, at the Shire's discretion a development contribution from the developer for the upgrading or construction of a stormwater disposal system may be considered. In some circumstances the developer may need to negotiate access rights across another landowner's property to connect to the local government's storm water system.

This Policy is in accordance with or consistent with:

- State Planning Policy 2.9: Water Resources (2006)
- WA Stormwater Management Manual (2004)
- WAPC Better Urban Water Management (2008) framework,
- State Water Plan (2007)
- State Water Strategy (2003)
- State Planning Strategy (1997),
- Liveable Neighbourhoods (2007



Further guidance for developers can be found here:

- Stormwater Management Manual for Western Australia: http://www.water.wa.gov.au/Managing+water/Urban+water/Stormwater/Stormwater+management+manual/default.aspx.
- Urban water management guidance: http://www.water.wa.gov.au/Managing+water/Urban+water/Urban+water+management/default.aspx.
- http://www.newwaterways.org.au/Resources/Policy-and-guidelines.

The above local planning policy will be incorporated into the Shire of Irwin's Local Planning Scheme No.5, available on the Shire's website www.irwin.wa.gov.au.

ACTION PLAN



The Action Plan below will be developed by Shire Officers, and will include details relating to responsibility, cost and measurable objectives, including timeframes. It is envisaged that, like the strategy, the Action Plan will be a living document that changes over times as older actions are replaced by new actions

Initiatives	Target date
Develop a Waterwise Program	2017-18
Develop and implement energy saving initiatives in all Shire Buildings	2017-18
Investigate the potential for Solar PV systems on all Shire buildings	2017-18
Move the Shire's administration towards paperless systems	2017-20
Lobby Western Power to implement energy efficient streetlights	Ongoing
Investigate how to attract renewable energy projects to the Shire, including solar farms and wind farms	2017-20
Investigate opportunities for cogeneration and trigeneration power for Shire buildings	2017-20
Bikes for short staff trips	2017
Develop Guidelines for Living Smart – simple living, water, power, waste, gardening for food production & biodiversity	Completed

Projects	Target date
Irwin River Revegetation	Ongoing
Point Leander Drive verge planting program	Stage 2 2017
Rationalise existing Public Open Spaces in accordance with the provisions of the Council Policy for Existing Public Open Space	2017-20
Retrofit Shire road reserves with sustainable drainage systems	2017-2021
Undertake energy audits for all Shire buildings	2017-2018
Develop a Local Biodiversity Strategy	2020