Brisbane's Total Water Cycle Management Plan

I ♥ BNE
That's why I'm smart with water

BRISBANE CITY
Dedicated to a better Brisbane

Contents

Lord Mayor's message

We've come a long way on our water smart journey.

From a small outpost that struggled to provide its residents with clean drinking water during the early 1800s, we've become a sophisticated city that manages water at all stages of the water cycle.

In 2004, we produced our first integrated water management plan. Since that time much has been learnt and put into practice. We've pursued water conservation rigorously and made decisions with water in mind. We've embraced our river and worked hard to bring our local creeks back to life. We've learned how to live with flooding and have invested over $500 million to protect our residents with necessary flood mitigation infrastructure.

Council's *WaterSmart Strategy*, released in 2010, presented Council's vision to transform Brisbane into a truly water smart city. In the three years following the strategy's publication Council has been focused on delivering this vision. However, several events occurred over this period of time that altered Council's priorities and its strategic approach to water management. These included a major river flood, the release of a new economic development strategy for the city and the transitioning of responsibilities for water supply and sewage treatment from Council to Queensland Urban Utilities. As a consequence of these events we have refined our approach to creating a water smart city.

Now, *Brisbane's Total Water Cycle Management Plan* outlines the practical actions Council will take to realise this vision. *Brisbane's Total Water Cycle Management Plan* is a long-term implementation plan – a tool to guide strategic planning and collaboration with Council's partners – yet it also sets the organisation's short-term priorities. In addition, the plan refines the *WaterSmart Strategy*, bringing it into the present.

Brisbane's Total Water Cycle Management Plan supports the city's continued economic development by helping it evolve into one of the world's top 10 lifestyle cities. It's a sustainable plan for the future of Brisbane and I'm proud to endorse it.

Graham Quirk
LORD MAYOR

Introduction

***Brisbane's Total Water Cycle Management Plan* fulfills Council's obligations under the Queensland Government's Environmental Protection (Water) Policy (2009) of the *Environmental Protection Act 1994*.**

Brisbane's Total Water Cycle Management Plan aligns with Council's long-term community vision, Brisbane Vision 2031, and builds on the vision, goals and outcomes contained in the *WaterSmart Strategy*. It provides a 20-year implementation plan and framework to guide detailed planning around issues such as improving Brisbane's flood resilience, the value of water in supporting Brisbane's liveability and the health of our river and bay. Implementation of these detailed plans will be subject to Council's annual planning and budget cycle, where competing proposals are prioritised. *Brisbane's Total Water Cycle Management Plan* will also be used to facilitate regional collaboration on water cycle management, natural resource management and infrastructure and land use planning.

Council no longer distributes bulk water or takes the lead in wastewater management. This is now the responsibility of Queensland Urban Utilities following a restructure of the water sector in 2010. Queensland Urban Utilities delivers water and collects, transports and treats sewage and trade waste. *Brisbane's Total Water Cycle Management Plan* recognises that partnering with industry members such as Queensland Urban Utilities will be critical to achieving the *WaterSmart Strategy* vision:

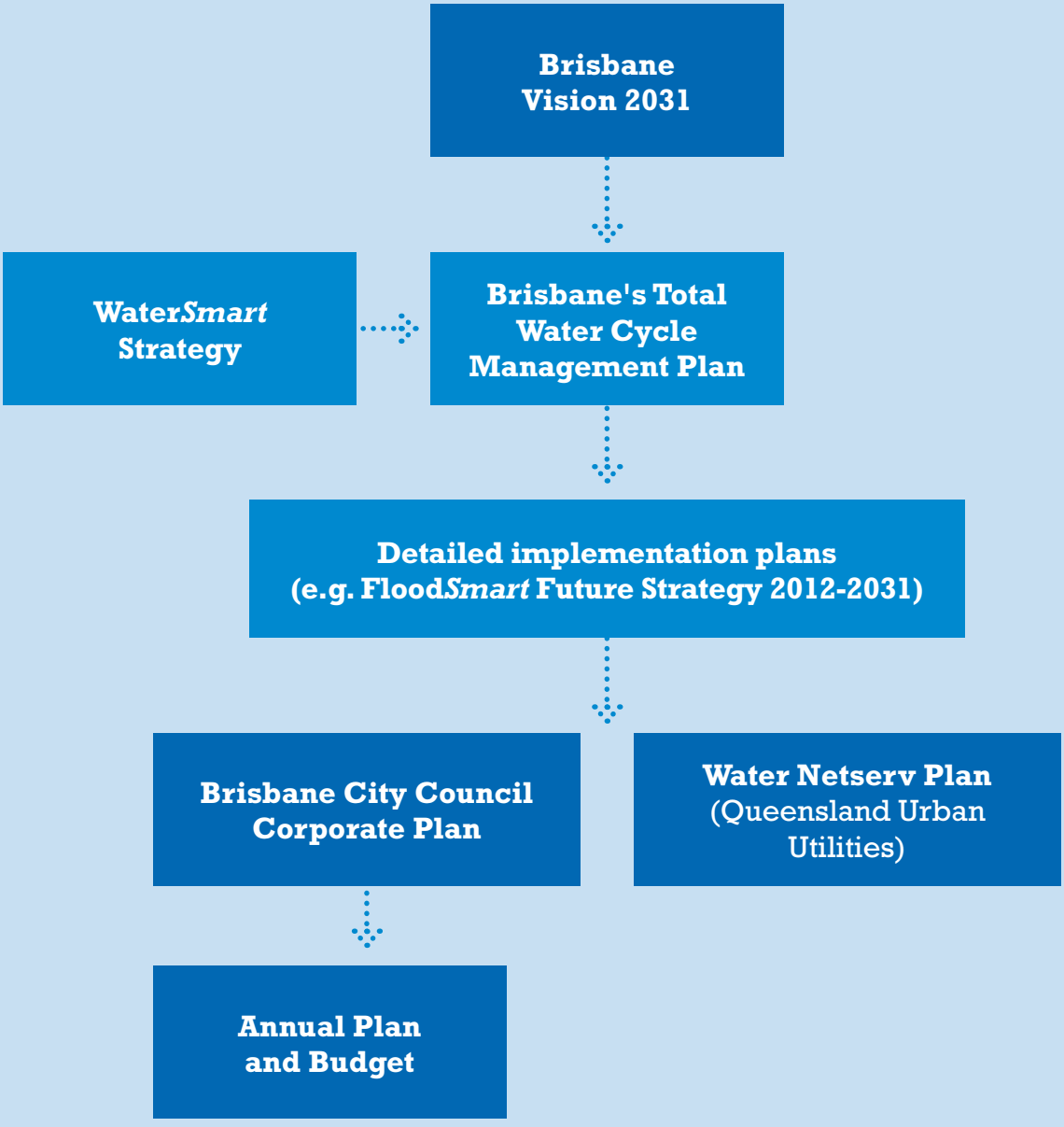
To support the liveability of Brisbane by managing water sustainably.

Queensland Urban Utilities was an integral partner in the development of *Brisbane's Total Water Cycle Management Plan*. When preparing and updating its own *Water Netserv Plan* QUU will draw upon *Brisbane's Total Water Cycle Management Plan*. The Netserv plan is a strategic document that provides an overview of Queensland Urban Utilities' water and sewerage infrastructure planning and development for the next 20 years. Details of water supply, wastewater management and trade waste management actions and objectives can be found in Queensland Urban Utility's *Water Netserv Plan*.

To realise our water smart vision, Council will work with community and partners in the broadest sense, including residents, community groups, business, industry, local councils, the Queensland Government and many others.

Legally, *Brisbane's Total Water Cycle Management Plan* must be reviewed every five years. Council will continually monitor and adjust the plan to reflect ongoing advances in water management, shifting community priorities and events such as significant floods and droughts.

Brisbane's Total Water Cycle Management Plan relationship with other planning documents



Challenges and opportunities

Council released its *WaterSmart Strategy* in 2010 as one of Australia's worst recorded droughts was breaking. The Millennium Drought reshaped Brisbane's relationship with water turning us into a city of water savers and sharpened government policies on water conservation, education, recycling and reuse.

In line with international and national best practice, an increasing emphasis was placed on the wider ecosystem services that water provides, such as the social and amenity values of waterways, bringing a sense of place, of being part of a subtropical city and building future resilience against climatic extremes. These factors influenced the *WaterSmart Strategy* however it is underpinned by a total water cycle management framework.

In the two years following the strategy's publication several events occurred which altered both Council's priorities and its strategic approach to water management. These included a major river flood, the release of a new economic development strategy for the city and the transitioning of responsibilities for water supply and sewage treatment from Council to Queensland Urban Utilities.

Each of these events shaped and refined Council's thinking on water management ultimately guiding the selection of strategies and actions included in this document. While flooding has always been a pillar of water planning in Brisbane, the 2011 flood has driven a much stronger focus on flood risk management.

In developing this plan a situational analysis was undertaken identifying current challenges and opportunities for total water cycle management in Brisbane.

Customer focus

A customer focus approach requires an understanding of the needs of our residential and commercial customers while adding value to maximise the benefits of our products and services.

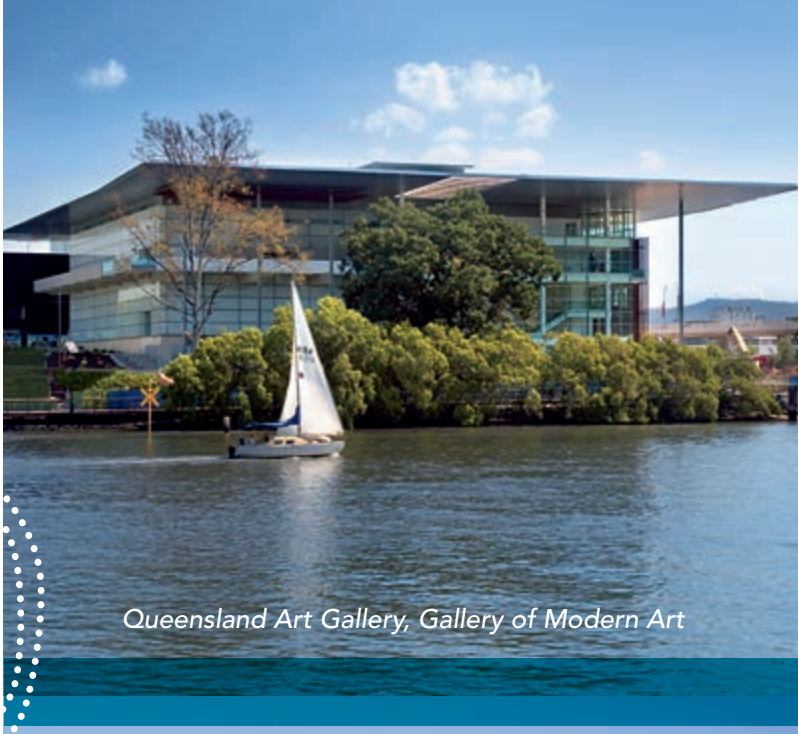
Challenges include a changing climate, operating costs and the inability of Council to control the whole water cycle. Opportunities present themselves in the form of identifying synergies, continuing to integrate sustainable practices and collaborating with other agencies and councils to provide tailored products. With this understanding, products and services can be designed that align with our community values. This approach enables responsiveness to changes in customer needs and values that occur over time.

Cost efficiencies

This plan identifies mechanisms to achieve the cost-effective delivery of activities and services performed by water industry partners across the region. The opportunities for cost efficiencies can be categorised into three areas; scale efficiencies, synergies and innovation.

Scale efficiencies for products such as potable water supply and sewage treatment are well understood, but can be equally relevant for achieving cost efficiencies in waterway health management, flood management, communications and built environment. *Brisbane's Total Water Cycle Management Plan* identifies opportunities to seek these scale efficiencies.

The plan also identifies synergies in both planning and implementing water smart initiatives. For example the benefits of coordinated construction activities produce savings such as lower construction and restoration costs and also reduced disruption to the community. Integrated planning delivers multiple outcomes that the community seeks in public facilities such as parks, sporting fields, bikeways and roads. A stormwater harvesting site can irrigate sports fields, treat stormwater, create a water body for passive recreation and provide water for the maintenance of old landfill sites. This plan champions this integrated approach with partners across South East Queensland.



Queensland Art Gallery, Gallery of Modern Art

Innovation can improve product quality, reduce cost, and provide for customer needs in ways never thought of before. The benefit of innovation is not just financial but also social and environmental.

A number of studies have suggested that environmental offsets and bubble licences can achieve environmental outcomes while reducing the cost of service provision by delaying investment in traditional infrastructure. Bubble licenses are a form of trading scheme that allow for emissions from a number of sites within a licence to be considered as a whole. This enables emissions from underperforming sites to be balanced against emissions from over-performing sites, allowing the overall performance of the site to meet licence levels.

This flexibility allows for emission levels set by the licence to be met in a cost-effective manner rather than forcing investment at a particular site which may only produce a marginal improvement in water quality. Environmental offset schemes allow development and construction activities to meet emission standards in situations where the site or technology may be constrained or limited. This ensures development has minimal impact on the environment. Environmental offsets can also help address legacy issues by revegetating degraded systems which then capture pollutants and thereby offsetting the initial activity. Such schemes provide flexibility and the opportunity to tailor actions and investment to obtain greater net gains in terms of water quality improvement.

The challenge is to identify and mainstream new technologies throughout South East Queensland. Legislation and policy needs to support innovation while ensuring the underlying intent, such as public and environmental health, is maintained.

Economic and population growth

Queensland's resources boom is transforming Brisbane's economic landscape and generating unprecedented opportunities. Council is implementing the *Brisbane Economic Development Plan 2012-2031* to harness this economic potential, create new jobs and boost investment in the Central Business District and our suburbs.

This plan aligns with Council's priorities for economic development which includes using Brisbane's liveability as a drawcard for highly-skilled workers and students. Research shows that while people move to new cities for jobs, the reason they stay is for the lifestyle. Sustaining Brisbane's high quality lifestyle will be critical to attracting and retaining the talented people needed to bolster the city's future labour force.

Brisbane's waterways and bay contribute directly to Brisbane's economy by providing transportation corridors, primary industry, tourism and leisure and as a key input to a number of other industries. Water infrastructure such as water supply, sewerage, stormwater drains and waterway corridors underpin Brisbane's development and redevelopment.

Population growth is expected to continue at a fast pace in Brisbane. The Queensland Government's *South East Queensland Regional Plan 2009 - 2031* projects a further 156,000 new dwellings in Brisbane by 2031 with 138,000 of these dwellings to be delivered as infill development. This growth will place more strain on our waterways and water sources.

However, a more dense built form provides Brisbane with opportunities for creative use of water in private and public spaces which can create places that are cooling and pleasant. These spaces can be developed to treat and reuse stormwater on-site while providing multiple benefits such as passive recreation and habitat.

Brisbane's Total Water Cycle Management Plan reflects these considerations. Strategies have been developed which promote water smart outcomes that are cost effective and achieve multiple benefits. In addition strategies aim to maximise the health of the Brisbane River and local waterways, developing their potential as recreational spaces, ecological assets and places of natural beauty, in order to enhance Brisbane's liveability. It also addresses the direct economic impact of stormwater, waste water and water supply systems and the need for continued investment in these systems.

A changing climate

The future of our climate is unpredictable. It is likely to include higher temperatures, longer dry periods and intense rain events. This may mean Brisbane's natural cycle of drought and flooding rains will become more extreme.

A changing climate can provide the opportunity for us to be innovative in our solutions. Brisbane is committed to adapting the way we manage public spaces, buildings, waterways, overland flow paths and Brisbane's floodplains to make the city and its community more resilient to change.

Moving forward

While many of the drivers identified above are relevant across Australia, our challenge is to tailor solutions to suit Brisbane. We need to ensure that Council considers climate, community, existing built environment and infrastructure, pattern of growth and economic drivers of our city.

Implementation plan

The following section provides an implementation plan built around the *WaterSmart Strategy* goals:

A water smart community

Well-designed subtropical city

A healthy river and bay

Sustainable water use

Each section outlines where we are now and strategies and actions for achieving the respective goals. The implementation of strategies and actions is subject to the constraints of Council's budget and resources available. A context and value section provides a rationale and benefit for the strategies and actions listed. Due to the integrated nature of total water cycle management a number of the strategies and actions are relevant to one or more of the *WaterSmart Strategy* goals. These links are indicated numerically in the tables below.

The diagram below illustrates the broad approach Council adopts in developing, implementing, evaluating and modifying the strategies and actions contained within *Brisbane's Total Water Cycle Management Plan*.

A water smart community

A water smart community is one that is connected to water, participates in decision making and takes action to manage water sustainably.

Outcomes

1. People have a good grasp of the scope of water management for the region and have a collective ambition for Brisbane to be a water smart city.
2. The community engages in strategic and practical initiatives, at household through to regional levels, to drive sustainable water management.
3. Council leads by example, regulates, collaborates and facilitates Brisbane's progress to a water smart city.

Where are we now

In the past decade, Brisbane experienced its most sustained drought in more than 100 years and its largest flood in more than 35 years. The community's response was effective to drought and rapid to the Brisbane River flood of January 2011. This high level of flexibility and resilience demonstrates that we are capable of changing our behaviour in water smart ways.

As a community, we recognise the value of protecting, enhancing and improving the health of the river, bay and waterways. Yet we need greater understanding that being water smart means more than water conservation and that our individual actions impact the health of our water and waterways. We also need to understand that Brisbane is situated on a flood plain, with a subtropical climate subject to floods, droughts and high rainfall storms, and that our waterways should be activated with the right uses in the right places. Council will continue to engage and educate our community, build water smart awareness and behaviours, work with business and industry and support community groups and individuals to become water stewards who actively care for Brisbane's water and waterways.

Council currently engages with stakeholders and the community in its catchment and waterway management activities. Key activities include supporting and partnering with community groups to repair and rehabilitate degraded streams. Council also coordinates major projects such as Norman Creek 2012-2031 and construction of Coorparoo Creek Park. Council provides timely information so residents, the business community and property owners can be safe, confident and ready for flooding.

Council uses multiple engagement tools and communication channels including online, media and face-to-face engagement to engender behavioural change. Council also participates in, and supports, festivals and events that celebrate water and communicate water smart messages to residents, business and industry such as the International Riversymposium, Council's Green Heart sustainability events and other localised community events.

Council works in partnership with others to achieve Brisbane's water smart vision. Council is participating in the Cooperative Research Centre for Water Sensitive Cities with more than 74 organisations nationally who are also seeking practical solutions and mechanisms to support a more integrated water future. Council also partners with Healthy Waterways, a not-for-profit, non-government organisation, to support waterway health across regional boundaries in South East Queensland.

Case study: Safety through technology

Technology is reshaping our world. Almost 90% of Australians over 14 years own or use a mobile phone and this trend is continuing to grow. More people are also using their phone to check emails and access the web, as well as for calls and texting. Accessing video, music and information via mobile phones has become mainstream.

During the 2011 floods, Council posted web updates and used social networking sites to connect people to support services and share information on dangerous and blocked roads. Thanks to Council's free mobile application, brisbanecity.mobi, residents will be able to download this information direct to their phone, along with flooding maps and property reports. Residents can also register to receive early flood warnings via their mobile.

Extensive research with more than 2200 residents over the past two years has informed Council's investments in new technology. Council used one-on-one interviews and focus groups, together with telephone and online surveys, to identify the flood information residents most wanted and how best to deliver it. Council continues to monitor and respond to changes in technology and continually evolves to find the best ways to communicate with our residents.

Implementation

1.1 Council leads by example in demonstrating water smart behaviours.

Context

There is an opportunity for Council to advance its water smart vision by further integrating water smart concepts and actions where cost effective across policy areas. We need to embed catchment management principles within all planning decisions and integrate water smart principles across Council's activities which aligns with our 'One Council' approach. Council will show leadership by facilitating and supporting activities that demonstrate excellence in science, research and innovation to progress water smart outcomes in our city and will integrate these into its own sites and projects where viable.

Value

Residents, business and industry will find new ways of demonstrating water smart behaviour as Council leads by example. By adopting water smart actions based on best practice research and innovation, Council can demonstrate strong and positive leadership maximising the benefit received from our water resources while minimising impact on our waterways and bay.

Action	Tactics
1.1.1 Water smart policies and procedures. Council will ensure services, systems, policies and procedures enable Brisbane to become a water smart city.	▸ Ongoing integration of water smart actions into Council policies, strategies and standards including the *Strategy for Young People, Active and Healthy Strategy and Creative Cultural Strategy*. (Links to 1.2.2) ▸ Review and refresh the corporate rules, procedures and standards to ensure water smart outcomes for Council-wide implementation. ▸ Ongoing promotion of water smart actions and behaviour through internal and external communication channels. ▸ Deliver training across Council to build water smart awareness, capacity and integration. ▸ Council will promote the adoption of water smart practices to Council suppliers where viable.
1.1.2 Science, research and innovation. Participate and partner in research and education initiatives to progress water smart behaviour, innovation, science and technology.	▸ Continue to partner with the national research program, Cooperative Research Centre for Water Sensitive Cities, to deliver urban water management solutions, education and training programs, and industry engagement required to help make Brisbane water sensitive. (Links to 3.3.4) ▸ Identify new research, innovation and collaborative opportunities to progress water smart initiatives and outcomes in a cost effective manner. ▸ Ongoing support and participation in the International Riversymposium and of other international water conferences such as the International Water Congress in 2016. (Links to 3.1.3) ▸ Continue to gather baseline data through Council's market research tools to measure and respond to the community's water smart attitudes and behaviours. ▸ Develop an annual grant to support post graduate research into water smart topics. ▸ Ongoing research into the water smart behaviours of culturally and linguistically-diverse communities.

1.2 Maintain or improve the community's awareness of water smart.

Context

Work is needed to increase community understanding of the many facets of being water smart, from understanding that we all live in a catchment through to the impact that individual action has on our waterways.

Council's October 2011 Omnibus survey revealed that 95% of residents believe being water smart includes water conservation. By contrast, only 74% of residents consider caring for our waterways, or participating in clean-ups at the local creek, as being water smart.

There is a need for communication, engagement and behavioural change tools to inspire and encourage people to take water smart action in their daily life.

Brisbane is a friendly, inclusive and progressive city home to many people from diverse backgrounds and cultures. According to the 2011 Census, 295,181 people or 28.3% of our population were born overseas. Further work needs to be done with people from culturally and linguistically-diverse communities to build our water smart community.

In addition, an emerging body of research suggests that contact with nature during childhood plays a significant role in forming environmentally-responsible attitudes in adulthood. A focus on connecting people to local waterways can help facilitate this outcome.

To support this connection, an ongoing opportunity exists for the broader community to understand an Aboriginal cultural perspective of our waterways. The river and its tributaries were the source and support of life in all its dimensions for the Jagara and Turrbal groups and for Quandamooka and Jinibara people in the greater Brisbane region.

Value

Brisbane's waterway health will be maintained as our community better understands water smart concepts and behaviours.

Connecting people to waterways has multiple benefits including increased understanding of where our waterways are and familiarity with their seasonal flows, a stronger connection with, and appreciation for, our waterways and accompanying fauna and flora, better physical and mental health, and greater adoption of water smart actions in daily living.

Action	Tactics
1.2.1 Festivals and events. Support community festivals, events and activities that celebrate and educate the community about water and waterways.	▸ Deliver signature, citywide events and community events that incorporate water smart engagement, celebration and communication activities. Examples include Riverfire, the Royal Queensland Show (Ekka), Council's Green Heart sustainability events, culturally and linguistically-diverse community events and the Peaks to Points Festival. (Links to 1.5.1 and 3.1.3)
1.2.2 Local waterway connection. Provide opportunities for people to connect with water, especially their local waterway, to build community appreciation of water and their wider recreational and social values.	▸ Promote access points, pathways and bikeways along waterways and wetlands through channels such as Council's website and mobile phone applications. (Links to 2.2.2, 3.2.3) ▸ Ongoing connection of people to waterways through Council's active and healthy, arts and cultural programs. (Links to 1.1.1) ▸ Develop and deliver the 'Take a peek at your creek' campaign connecting people to their local waterway through activities such as storytelling, arts-based projects and nature play.
1.2.3 Community awareness. Raise the profile of Brisbane's waterways and catchments to generate community awareness of the impact of individual actions on waterway health. Partner with industry, Healthy Waterways, Queensland Urban Utilities and other peak bodies.	▸ Ongoing delivery of interpretive signage along waterways and in parks to increase water smart awareness. ▸ Deliver a signage template for water smart urban design projects explaining how they contribute to water smart outcomes. ▸ Ongoing delivery of communication and marketing campaigns, in partnerships with external partners when appropriate, to raise awareness of water smart behaviours and actions. ▸ Develop a communications plan for waterways so that internal and external stakeholders recognise and maintain the essential, environmental and hydraulic functions of waterways. ▸ Work with the local Indigenous community to explore opportunities to share an Indigenous cultural perspective of water throughout Brisbane.

1.3 Maintain or improve the community's adoption of water smart behaviour.

Context

Six years of local waterway health monitoring has been analysed and indicates our waterways are impacted by high nutrients from fertilisers and detergents, pest fish, litter and weeds.

This understanding means we can target the community as a whole to increase water smart actions to support waterway health.

Council's October 2011 Omnibus revealed particular areas for focus: 54% of residents wash their car on the grass, an increase of 4% from the previous year; and only 6% of residents surveyed built a raingarden, a simple tool to cleanse run-off before it reaches the stormwater system.

Greater promotion of simple, individual actions such as slowing the flow of water in the garden so it soaks into the ground, picking up dog droppings, minimising chemical and fertiliser use, not releasing aquarium fish into waterways and implementing water smart urban design will support waterway improvements.

Water smart needs to be integrated into a larger sustainability picture including energy use, growing food in the city and supporting biodiversity.

From a planning perspective, an opportunity exists in the new City Plan to improve and streamline standards for waterway corridor and stormwater management to ensure waterway corridor functions and water quality objectives are maintained.

Run-off from the city's urban spaces is a key contributor to decline in waterway health. In addition urban development outside of Brisbane can impact on our waterways therefore regional collaboration is vital. This can be achieved through participating in the South East Queensland Council of Mayors working groups and through supporting organisations such as Healthy Waterways.

Value

More people taking individual water smart action will lead to better water quality outcomes in the river and bay and a community whose understanding of, capacity for and action toward caring for our waterways continues to grow.

Clearer and more streamlined environment and sediment control standards will provide the development industry with greater certainty and direction. This will result in reduced sediment and pollution in waterways over the long term and a greater understanding of the importance of protecting Moreton Bay.

Action	Tactics
1.3.1 Water savers. Maintain existing community awareness and adoption of water conservation measures at appropriate times in conjunction with Queensland Urban Utilities.	▸ Ongoing incorporation of water saving messages within water smart marketing and communication campaigns.
1.3.2 Community action. Provide appropriate tools, services, incentives and products to encourage and support water smart actions by residents, community groups and businesses. (Links to 2.1.2)	▸ Ongoing integration of water smart actions into Council's sustainability behaviour change programs. ▸ Ongoing promotion and encouragement of water smart behaviours including simple actions for residents, the building of rain gardens and the implementation of water smart design for backyards. ▸ Promote and encourage water smart action and the implementation of water smart designs for Council projects and business where cost effective and viable.
1.3.3 Water smart industry. Educate and encourage industry and developers to reduce sediment run-off and point source pollution into waterways and to increase the application of water smart urban design. (Links to 2.1.2 and 3.3.3)	▸ Collaborate with regional partners and Healthy Waterways' Water by Design program to engage with industry and developers who operate across the region to reduce erosion and sediment in our waterways. (Links to 3.3.3) ▸ Work with industry and developers to improve awareness about regulations, sediment and run-off, and point source pollution. (Links to 3.3.3) ▸ Work with industry and developers to increase the application of water smart urban design in both small and large-scale developments where cost effective and viable. (Links to 2.1.1 and 2.1.2)

1.4 *Work with communities to enable them to become safe, confident and ready for flooding.* *(Links to 2.4)*

Context

Brisbane is built on a floodplain. We must become a city that lives well with flooding.

Council's integrated plan for flood risk management is *Brisbane's FloodSmart Future Strategy 2012-2031*. This strategy draws on national and international best practice and articulates, in detail, the actions Council will take to ensure Brisbane is a city that is safe, confident and ready for flooding. This will enable business and industry to better understand their flood risk and develop strategies to reduce the impact of flooding when it occurs.

Value

Council working together with a flood aware and resilient community will achieve improved flood risk management outcomes for the city.

By becoming better prepared, we can reduce the impacts of flooding, ensuring Brisbane remains safe and liveable, even during a flood event and has the capacity to recover quickly.

Action	Tactics
1.4.1 An educated and resilient community. Promote community awareness of flooding to increase readiness. (Links to 2.4.1)	▸ Provide simple, accessible and fit-for-purpose flood information, including sources of flooding such as overland flow and rising creeks that builds awareness of flood risk and links risk to action. ▸ Promote awareness of the weather extremes a subtropical city can experience – floods, droughts, storms and the variability of a changing climate. ▸ Encourage households in flood-affected areas to better prepare for and respond to flood events by developing household emergency plans. ▸ Encourage businesses in flood-affected areas to better prepare for, and respond to, flood events by preparing business continuity plans.
1.4.2 World class response and recovery. Further develop our capacity to recover from flood events.	▸ Continue to support Council's Disaster Management Plan by assisting in the development of an All-Hazards Disaster Management Strategy (including flooding)
1.4.3 Flood smart on the floodplain. Involve communities in floodplain management planning, catchment planning and masterplanning. (Links to 2.4.2)	▸ Complete top-priority creek floodplain management plans. ▸ Develop flood risk management marketing and communication materials for home, business and industry.

Water smart is…

understanding that we all live in a catchment

participating in catchment group activities that care for our waterways

making decisions with water in mind

understanding and responding to our flood risk

1.5 Support and facilitate the community's transition from water users to water stewards.

Context

Internationally, Singapore is well known for its leadership in the water sector. All Singaporean residents are encouraged to take ownership and be guardians of their water. Likewise, the European Water Partnership, Water Vision for Europe, seeks to encourage stewardship by all. It works from the premise that if people and stakeholders are mobilised around common values then water sustainability can be achieved in Europe.

By becoming water stewards the community cares for our water and waterways for future generations.

The Brisbane community already demonstrates strong water stewardship and has contributed untold hours to the preservation and protection of our waterways and bay.

Council's Community Conservation Partnerships program supports creek catchment and Habitat Brisbane groups to share information, restore natural habitats in parks, remnant bushland, wetlands and along waterways. It also delivers a Wildlife Conservation Partnerships program protecting more than 2000 hectares of our most ecologically-important privately-owned bushland and wetlands. The program also develops partnerships and projects to address citywide environmental issues.

The catchment and Habitat Brisbane groups are volunteer based and membership includes passionate and highly-skilled individuals who are great water stewards for Brisbane. Habitat Brisbane supports the work of approximately 2500 community volunteers, rehabilitating 141.91 hectares across the city. In 2009/10 Council helped coordinate 11 catchment groups to initiate 8500 hours of volunteer work which included removing 3944 cubic metres of weeds and rubbish, planting over 25,960 plants and rehabilitating over 9.7 kilometres of waterways.

At the time of the 2011 Census, Brisbane City Local Government Area (LGA) had 176,460 volunteers aged 15 years and over. The value that the Brisbane community provides to our society from volunteering was estimated at $1.98 billion in 2006.

Council supports the community in its water steward capacity through grants and other mechanisms. The 2012/13 Council grants program provides $360,000 in funding to support community groups and individuals to undertake activities to restore our local environment, waterways, local flora and fauna, and develop community gardens. A further $2.3 million is provided in 2012/13 for sporting clubs to become more sustainable.

Value

Brisbane's waterways are more likely to be preserved for future generations if our community becomes more engaged and actively involved in protecting and caring for them. This will increase their value and minimise the cost of maintenance required to preserve their health.

Action	Tactics
1.5.1 Partnering for Brisbane's water future. Engage and partner with the community, industry bodies including Queensland Urban Utilities, businesses, government agencies and regional partners to assist in shaping Brisbane's water future	▸ Support existing water smart ambassadors such as Healthy Waterways to build a water smart community and to collaborate on opportunities such as regional water events, litter management and backyard and business water smart urban design. (Links to 1.2.1 and 2.1.2) ▸ Identify and promote water smart ambassadors from community and business sectors to champion water smart actions and behaviours. ▸ Work with key stakeholders, industry, media and the community to become waterway stewards and advocates for water smart Brisbane. (Links to 3.3.2) ▸ Actively support the community to share water smart concepts and actions via social media and other online channels. ▸ Provide opportunities for different sectors of the community to collaborate in mutually-beneficial activities, for example, catchment groups, schools and community garden members working together to rehabilitate waterways and harvest stormwater for producing food in the city.
1.5.2 Support community groups. Work with local community groups and other relevant stakeholders to support water smart action including maintaining and enhancing riparian cover and in-stream habitat diversity.	▸ Ongoing provision of grants for community groups to support water smart action including the maintenance and enhancement of riparian cover and in-stream habitat diversity. (Links to 3.3.2) ▸ Ongoing provision of appropriate marketing collateral to community groups when available. ▸ Ongoing work with other areas of Council to identify water smart community group opportunities. ▸ Align Council's waterway enhancement schedule with the Community Conservation Partnerships program to facilitate community involvement in creek restorations. ▸ Partner with community groups to demonstrate water smart design.
1.5.3 Community leasing. Work with community groups to support integrated water management on sites leased from Council.	▸ Investigate and implement a plan to improve the water management of community groups on Council-leased land. This may include stormwater harvesting, stormwater treatment, amenity, revegetation of creeks and irrigation strategies.

Case study: Restoring the Bulimba Creek Oxbow

A 30-hectare industrial wasteland in Murarrie has been transformed into a thriving wetland, sustaining more than 60 bird and 35 fish and crustacean species, thanks to a unique government, business and community alliance.

Tucked into a once isolated loop of Bulimba Creek, the previously degraded wetland was threatened with further destruction in 2002 when construction began on the Port of Brisbane Motorway. Community members joined with the Department of Transport and Main Roads, Powerlink, Motorway Alliance and the Bulimba Creek Catchment Coordinating Committee to rehabilitate the site while the motorway was built.

Extensive eco-hydrology works were undertaken while contractors hauled away rusting car bodies and volunteers replanted mangroves, weeded, removed rubbish and restored wetland vegetation. Council promoted planting days and boosted onsite works through its employee volunteer program.

After a decade of hard work, the functioning salt marsh brims with life. Red-rumped parrots and masked lapwings are among the native birds now spotted on site. Reconnecting the Oxbow to surrounding natural waterways has dramatically improved water quality and fish species including yellow-fin perchlet, southern herring and tiger mullet have all made their way back into the wetland. Studies show the wetland has even become a fish and prawn nursery while wallaby paw prints suggest the local fauna know about it too.

Bulimba Creek Oxbow

Well-designed subtropical city

Designing and reorienting our city with water in mind.

Outcomes

1. Water and waterways are determining factors in the design of Brisbane's built form.
2. Flooding is managed effectively so the Brisbane community and our built form adapt to the natural movement of water.
3. Systems and processes are in place to support the effective, integrated management and implementation of on-ground solutions.

Where are we now

In the past, urban planning and development considered all elements of the water cycle separately, be they water quantity or quality. In contributing to a well-designed subtropical city, Council considers water resources issues holistically, integrating sustainable water management within its land use and infrastructure planning. With this in mind, the principles of water sensitive urban design to the formulation of new flood codes are embedded in the new City Plan.

Looking to the future, integrated catchment, local and site planning and integrated design will maximise the multiple community and liveability benefits that can be achieved from water and waterways within our urban environment. This will support green infrastructure that will integrate into the built form, marrying the principles of water sensitive urban design with climate responsive and sustainable design outcomes. If we then couple this thinking with economically-viable and cost-effective delivery methods, Council has the ability to provide great spaces and places.

The multiple values of our waterways provide opportunities to redesign the city while recognising waterway health and flood risk as two of their key functions. Projects such as Norman Creek 2012-2031 and construction of the Coorparoo Creek Park are wonderful examples of integrated planning that support water smart outcomes.

Following the January 2011 floods, there have been a number of activities related to the flood and future flood management, improving Brisbane's understanding of floods and our ability as a city to respond to them. These include Council's Flood Response Review, Queensland Floods Commission of Inquiry and Council's *Flood Action Plan*. Council has now developed an overarching strategy to help Brisbane become a city that is better prepared for flooding – the *Brisbane FloodSmart Future Strategy 2012-2031*. The strategy takes a flood risk management approach which considers the likelihood and impact of flooding and provides an integrated mix of measures and actions to help manage and mitigate these risks. This strategy will assist business and industry to invest with confidence, knowing the right development is in the right place, and to better understand and manage flood risk. Brisbane's residents will be equally informed of their flood risk so they can build or buy with confidence.

Case study: Water smart building design

Brisbane Square, home to Council's inner-city offices, library and customer service centre, is leading the way in water smart building design. One of the largest commercial office buildings in Australia to be awarded the Five-Star Green Star rating for ecologically-sustainable development, this high-rise building in Brisbane's CBD has reduced mains water consumption by 75-85% through innovative water saving devices.

Brisbane Square features on-site rainwater tanks, a sewage treatment plant that recycles, treats and sterilises waste water for toilets, irrigation and washdown, and is the city's first building to use river water to cool its air-conditioning system.

While traditional cooling towers also service the building, automatic isolation valves allow building managers to switch to the river system, significantly reducing potable water consumption. Specially-designed nozzles ensure the warm discharge water mixes quickly with river water, reducing the chance of feeding algal blooms, and the tunnel that carries the system's pipes down to the river now doubles as path for cyclists into the building's basement.

Water meters installed in Brisbane Square measure water use and a leak detection system limits potential wastage.

Implementation

2.1 The built environment cost effectively mitigates adverse impacts upon waterway environmental values and local drainage patterns, and supports wider social, amenity and recreational outcomes derived from stormwater and waterways.

Context

As Brisbane grows, and urban development intensifies, our waterways will come under greater pressure.

The Queensland Growth Management Summit 2010 (Social Research on Population Growth and Liveability in South East Queensland March 2010) identified marine and waterway health as having the strongest influence on residents' perceptions of whether population growth will be positive or negative for South East Queensland.

Growth also provides opportunity. For example research, education and integrated design can change and improve the urban landscape as areas are redeveloped.

Where cost effective and viable best practice water smart principles will be encouraged when urban re-development occurs. This will help our city become more water smart over time.

A water smart built environment uses waterways, vegetated treatment systems and clever design to green the urban environment, promote sustainability and enable us to live comfortably in a subtropical climate.

The built environment can provide essential ecosystem services to people and nature by holding back, infiltrating, reusing and cleaning water before it reaches our waterways; and by providing water features that support urban green infrastructure, heat island cooling and create pleasant places to live and work.

Urban waterways provide environmental values beyond ecological health and flood conveyance, such as recreational, social and amenity values.

By managing adverse impacts such as increased stormwater run-off we can protect our waterways' health, improve our social amenity, better manage flooding and improve the economic growth of our city by delivering a great place to live.

Council is required to comply with both state and federal legislation and to reflect this legislation, where necessary, in our City Plan. This enables the city to develop and grow while protecting its waterways and water resources. Queensland Government legislation and policies for healthy waterways in the new City Plan and other planning instruments will ensure new development maintains waterway health outcomes.

Value

Brisbane can continue to grow and develop while maintaining healthy, functioning ecosystem services and the lifestyle residents currently enjoy.

It will benefit from development that ensures the built environment minimises adverse impacts on waterways and maximises the benefits to the community and built environment through water smart planning, adding to the liveability and resilience of our urban environment.

Polices and incentives will provide the development industry with greater certainty about what it means to be water smart and when water smart principles should be applied.

Research and education will provide the opportunity for innovation and best practice in the urban landscape.

Water smart is...

including waterways as part of public open space

adopting a risk-based approach to flood management

planning with water in mind

creating a sense of place using water

Action	Tactics
2.1.1 Planning, building and design. Work with partners and industry bodies to develop and implement tools that deliver water smart outcomes and embed these within policy and planning frameworks. (Links to 1.3.3 and 3.3.4)	▸ Deliver water smart planning and design principles in planning tools, including the new City Plan. ▸ Ensure state policy requirements for healthy waters are within the new City Plan to deliver environmental value outcomes in new development, and develop a suite of complying solutions. ▸ Finalise an adaptive water smart decision support system to stimulate water smart outcomes. ▸ Develop an internet platform that contains guides, concept designs and illustrations that support water smart outcomes. ▸ Develop a pilot liveable waterways framework within a catchment with an accompanying implementation plan.
2.1.2 Research, education and incentives. Develop education tools and incentives for businesses and industry to adopt water smart elements in design. (Links to 1.3.2)	▸ Engage with partners and industry bodies to establish a community of business practice to further the adoption of water smart urban design and green infrastructure. (Links to 1.3.3) ▸ Engage with partners and industry bodies to research water smart urban design solutions. (Links to 1.3.3 and 1.5.1) ▸ Quantify the economic value and benefits of designing water into the built environment to business, industry and residents. ▸ Investigate and develop incentives that support cost effective water smart design solutions for new, infill and retro-fit development. (Links to 3.2.2) ▸ Investigate expanding the urban point source water pollution offset program and developing an offset program for urban diffuse sources of pollution. (Links to 3.1.1) ▸ Provide water smart design examples such as raingardens and accompanying interpretive signage at key Council locations such as Brisbane Botanic Gardens, Mt Coot-tha and Council libraries. (Links to 1.3.2)
2.1.3. Integrated design solutions for new development. Guide and support the creation of integrated design solutions for new development.	▸ Develop best practice water smart solutions that support outcomes such as urban greening, place making and climate-responsive design. ▸ Develop policies that encourage water smart outcomes in small-scale developments that are cost effective and viable. ▸ To support best practice water smart solutions look for partnerships with groups such as Healthy Waterways and Water Services Association of Australia.
2.1.4 Stormwater infrastructure planning. Develop and champion stormwater infrastructure planning and design to drive sustainable water outcomes into design at the street, neighbourhood and district scales.	▸ Ensure local stormwater management plans, stormwater management planning and drainage solutions support integrated water cycle outcomes. In the first instance this should seek on-site detention, infiltration and reuse of stormwater wherever possible. ▸ Develop water smart streetscape guidelines and park design tools to support the delivery of water smart outcomes in a practical and cost effective manner. ▸ Ensure that Council projects including Suburban Centre Improvement projects, road and parks planning, subtropical boulevards, shadeways and footpath upgrade projects support water smart outcomes where cost effective and viable. ▸ Update existing guidelines such as Stormwater Outlets in Parks to support water smart outcomes.

2.2 *Brisbane's waterways and overland flow paths form a network of open space in the urban fabric and are valued as an integral part of the city's open space system.*

Context

As Brisbane continues to grow population densities will increase and the value of our waterways as social and recreational assets will increase. Therefore waterways must be thoughtfully integrated into the urban fabric and public realm to meet the diverse open space requirements of residents. This integration must take into account the needs generated by changing population demographics and the cultural diversity in our city.

A more dense built form provides opportunity for creative use of waterways in private and public spaces. Spaces that are cooling, pleasant and provide for recreation and biodiversity.

Waterways can provide destination points close to high-density areas, while others can provide for more low-key social outcomes, nature-based recreation or flood mitigation.

Value

This will enable Brisbane to become a more vibrant and liveable city, underpinning further economic growth. It will increase the value of our waterways by creating new opportunities for recreation, leisure and business which can be generated by incorporating our waterways fully into the urban environment.

Waterway and overland flow paths provide an opportunity to create a new urban form that utilises waterways to support a connected, more resilient and liveable city.

Action	Tactics
2.2.1 Liveable waterways, liveable cities. Incorporate waterways as part of the city's essential green infrastructure, using citywide waterways as key elements of the city's open space network and local waterways as stepping stone corridors. (Links to 3.2.1 and 3.2.2)	▸ Embed a waterway corridor classification system that identifies citywide and local waterway corridors into the new City Plan. ▸ Develop waterway corridor practice notes that reflect key objectives and design criteria for different waterway types. ▸ Develop a streetscape design package that supports liveable and green streets, utilising stormwater management systems and overland flow paths as part of a connected open space system. ▸ Develop a natural environment water and sustainability green infrastructure framework to guide program planning. This should map our natural open space and waterway assets and illustrate how our green infrastructure interacts with our built infrastructure and contributes to a subtropical lifestyle. ▸ Embed the ecosystem service values of waterways and overland flow paths (which support connectivity, biodiversity, amenity and climate-cooling outcomes) within the planning for and design of our parks, open spaces, active transport and biodiversity projects.
2.2.2 Waterway access and activation. Ensure new development supports community use of waterways and adjacent parks. (Links to 1.2.2 and 3.2.3)	▸ Ensure all neighbourhood plans and Council projects support solutions that ensure greater community access to waterways. ▸ Deliver the *River's Edge Strategy*, a plan to guide access and activity on and alongside inner-city reaches of the Brisbane River. ▸ Ensure that access to our waterways implements universal design providing accessibility for all residents. ▸ Provide and maintain access points to the Brisbane River and waterways, supporting their use as key recreational resources. (Links to1.2.2) ▸ Maintain existing and deliver new waterway access infrastructure where budgets allow. ▸ Collaborate with other agencies annually to ensure the coordinated provision of waterway access.
2.2.3 Amenity. Ensure new development supports and embraces waterways for high-amenity outcomes. (Links to 1.2.2 and 3.2.3)	▸ Provide shade, seating, meeting places, vistas, viewing platforms and other facilities that encourage people's enjoyment of waterways. ▸ Implement water features and water-themed public art, including thought-provoking pieces prompting water smart behaviour in new and existing public spaces.
2.2.4 Demonstration projects. Implement projects demonstrating how the multiple values of waterways contribute to urban liveability. (Links to 3.2.1)	▸ Deliver projects such as Coorparoo Creek Park and Hanlon St Park as part of Norman Creek 2012-2031. ▸ Investigate other potential sites to deliver similar projects. ▸ Work with partners from the Cooperative Research Centre for Water Sensitive Cities to seek demonstration water smart projects throughout Brisbane. (Links to1.1.2)

2.3 *Council operates as a best practice leader and supports staff to progress water smart initiatives in their daily responsibilities.*

Context

Council's ongoing investment in assets provides the organisation with a great opportunity to become a best practice leader by integrating water smart initiatives within its projects.

Council is required to manage its built and natural assets under an asset management policy framework.

Effective strategic asset management and investment cannot be achieved without capturing the life cycle costs associated with the ownership of key assets. Life cycle costing allows for the true costing of an asset as it takes into account planning, acquiring, operating and maintenance of the asset.

Value

Embedding water smart principles, practices and policies into Council's asset management has the potential to minimise the impact of our infrastructure and built form on our environment contributing to healthier urban waterways.

By applying best practice asset management methods (including life cycle costs) to waterways and water smart assets, Council will continue to deliver desired levels of service for these assets to the community. By taking a life cycle analysis approach to investment and management of assets Council can ensure that assets function and are maintained in a cost effective manner.

By incorporating water smart principles into its assets, Council demonstrates to the development industry when and where water smart principles are applied.

Action	Tactics
2.3.1 Integration across Council. Develop and adopt a standardised procedure for assessing the viability of integrating water smart principles across Council activities.	▸ Develop support systems, tools, communication materials and key targets for integrating water smart principles into Council projects, plans and assets. ▸ Actively engage and provide support to program areas that facilitate the inclusion of water smart principles through Council planning, capital projects, and asset management plans. ▸ Scope viable water smart options for inclusion in park management practices.
2.3.2 Asset management. Apply best practice asset management principles and policies to waterways and water smart assets. (Links to 3.3.1)	▸ Develop waterway and water sensitive urban design asset management plans and classification manuals to minimise life cycle costs, support condition assessment, to achieve desired level of service and provide delivery planning. ▸ Develop a waterway classification framework that recognises the wider social, amenity, recreational and ecosystem services values provided by waterways to prioritise and guide optimal investment in waterways with consideration to life cycle costs. ▸ Use strategic asset management to deliver timely and affordable water infrastructure and services. ▸ Develop area-based delivery plans for the management and enhancement of waterway assets that considers the potential for multiple use. ▸ Integrate strategic asset management plans across assets such as parks, enclosed drains and waterways to obtain efficiencies in delivery.

2.4 *Ensure Brisbane is resilient to flooding and that flooding is expected, designed and planned for.* *(Links to 1.4)*

Context

Brisbane is built on a floodplain. Flooding is natural and a part of our lives.

Brisbane's built form can be adapted to withstand flood events, making our community more resilient to flooding.

Future challenges such as population growth and a variable climate mean we need flexible, adaptive approaches to managing flooding.

Smart flood risk management will ensure Brisbane can continue to develop and prosper economically, while protecting the environment and ensuring the safety of local communities.

Value

A risk-based approach to flood management results in more flexible, suitable solutions that protect life and property from the real threats posed by flood waters. It also provides Council with better tools to guide decision making and helps balance economic, social and environmental outcomes.

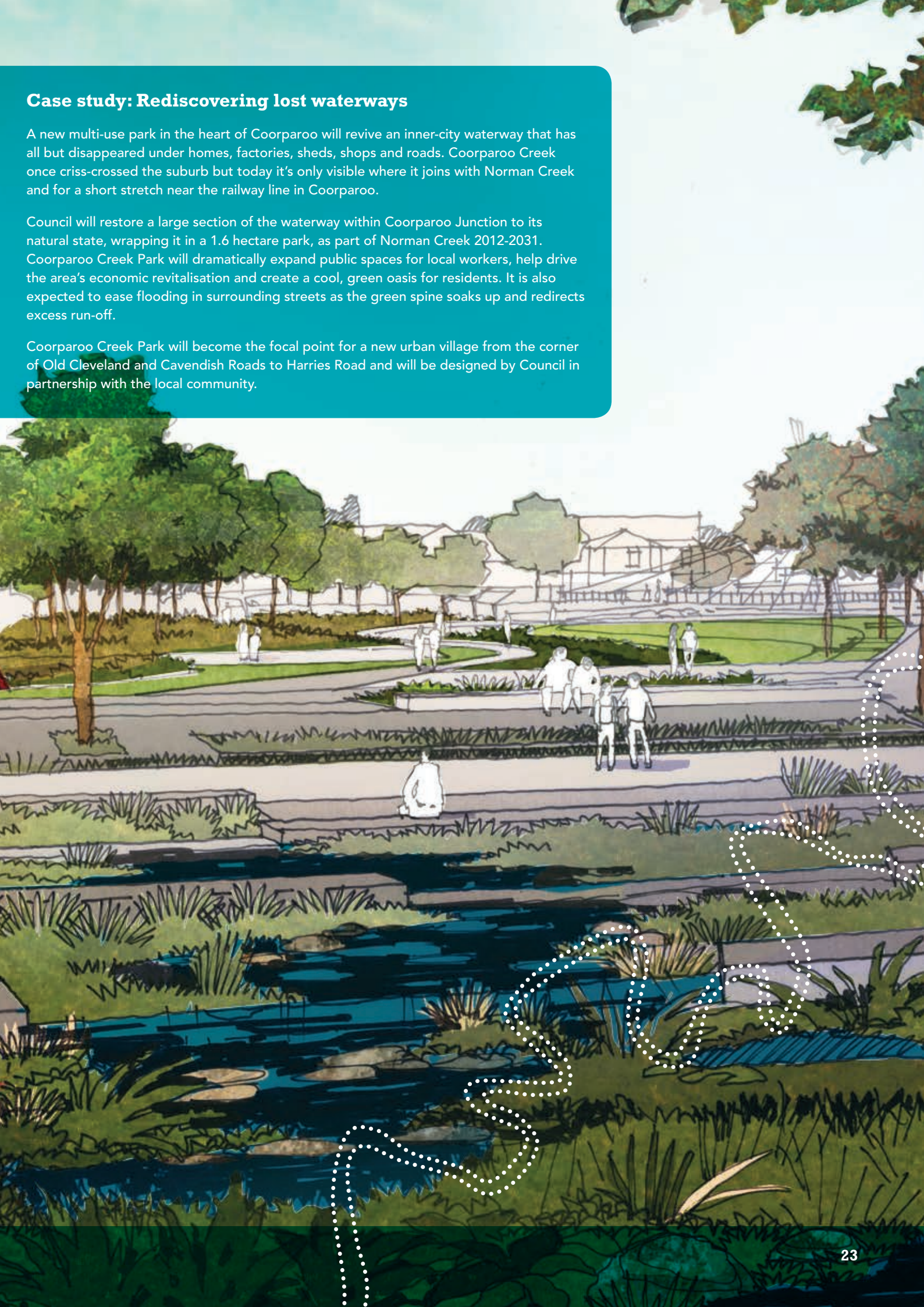
Action	Tactics
2.4.1 Risk management. Adopt a risk-based approach to managing flooding. (Links to 1.4.1 and 4.1.2)	▸ Incorporate risk-based considerations into new planning schemes and plans. ▸ Ensure flood emergency plans consider the appropriate response for all magnitudes of flooding. ▸ Develop guidelines to facilitate consistent approaches to flood risk assessment. ▸ Incorporate risk-based considerations into the design of all infrastructure located in the floodplain.
2.4.2 Adaptive approaches. Implement integrated and adaptive approaches to total water cycle management including flooding. (Links to 1.4.3)	▸ Develop catchment floodplain management plans. ▸ Develop a new flood planning policy for the new City Plan. ▸ Consider the full suite of flood risk management tools in developing flood risk assessments and plans. ▸ Assess flood mitigation infrastructure on a whole-of-catchment basis. ▸ Embed water smart principles within flood risk management plans and flood mitigation planning, including water sensitive urban design at a catchment scale. ▸ Consider the implications of a changing climate in all forward planning activities.
2.4.3 Smart planning and building. Shape the city's built form to increase resilience to flooding.	▸ Guide appropriate land use and development through application of the flood code in the new City Plan. ▸ Ensure new development is designed and constructed to be more resilient to flooding. ▸ Develop critical infrastructure movement networks across the city.
2.4.4 Invest in flood mitigation assets. Maintain and invest in flood mitigation assets to support Brisbane's continued economic growth.	▸ Maintain existing flood mitigation infrastructure to ensure its effective functioning. ▸ Identify and prioritise improvements to existing flood mitigation infrastructure. ▸ Invest in new flood mitigation infrastructure such as backflow devices.

Case study: Rediscovering lost waterways

A new multi-use park in the heart of Coorparoo will revive an inner-city waterway that has all but disappeared under homes, factories, sheds, shops and roads. Coorparoo Creek once criss-crossed the suburb but today it's only visible where it joins with Norman Creek and for a short stretch near the railway line in Coorparoo.

Council will restore a large section of the waterway within Coorparoo Junction to its natural state, wrapping it in a 1.6 hectare park, as part of Norman Creek 2012-2031. Coorparoo Creek Park will dramatically expand public spaces for local workers, help drive the area's economic revitalisation and create a cool, green oasis for residents. It is also expected to ease flooding in surrounding streets as the green spine soaks up and redirects excess run-off.

Coorparoo Creek Park will become the focal point for a new urban village from the corner of Old Cleveland and Cavendish Roads to Harries Road and will be designed by Council in partnership with the local community.



A healthy river and bay

Improving the health and resilience of our local waterways, the Brisbane River and Moreton Bay.

Outcomes

1. Brisbane's waterways are healthy and resilient and able to adapt to pressures and change.
2. Brisbane's waterways provide for multiple benefits including high amenity, recreation and economic values while securing vital ecological and floodplain functions.
3. Brisbane's built form delivers on the principles of the natural water cycle to ensure appropriate environmental flows and to improve water quality.

Where are we now

Brisbane has about 2700km of natural creeks and 300km of open channels with constructed assets. Our creeks are part of what makes Brisbane special, providing a natural asset the envy of many cities. This asset should be cherished and nurtured as a key lifestyle feature, supporting Brisbane's economic prosperity. The river, bay and waterways support 34 species of migratory shorebirds, seven species of sea turtle and iconic species such as the platypus, dolphins, whales and dugongs. Council is committed to meeting community expectations for improved waterway health so residents can enjoy our waterways for recreation as the city grows. Local waterways play a pivotal role in the lifestyle that Brisbane residents enjoy. Their ongoing health is vital in maintaining the economic and social benefits they provide to Brisbane.

Over the past decade, Healthy Waterways has reported a continual, slow decline in the health of Moreton Bay, the Brisbane River and our local waterways through its Ecosystem Health Monitoring Report Card for Moreton Bay, estuaries and freshwater streams. High sediment and nutrient loads from construction, land use changes, pollutants from rural areas and other legacy issues in urbanised catchments have contributed to this result.

Pleasingly, the 2012 report card results showed an improvement or a halt in the decline of the health of Moreton Bay, the Brisbane River and Brisbane's waterways. This can be attributed partly to investments in the catchment such as targeted riparian vegetation, programs such as the Two Million Trees project, waterway health enhancement programs and regional investment in upgrading sewage treatment plants.

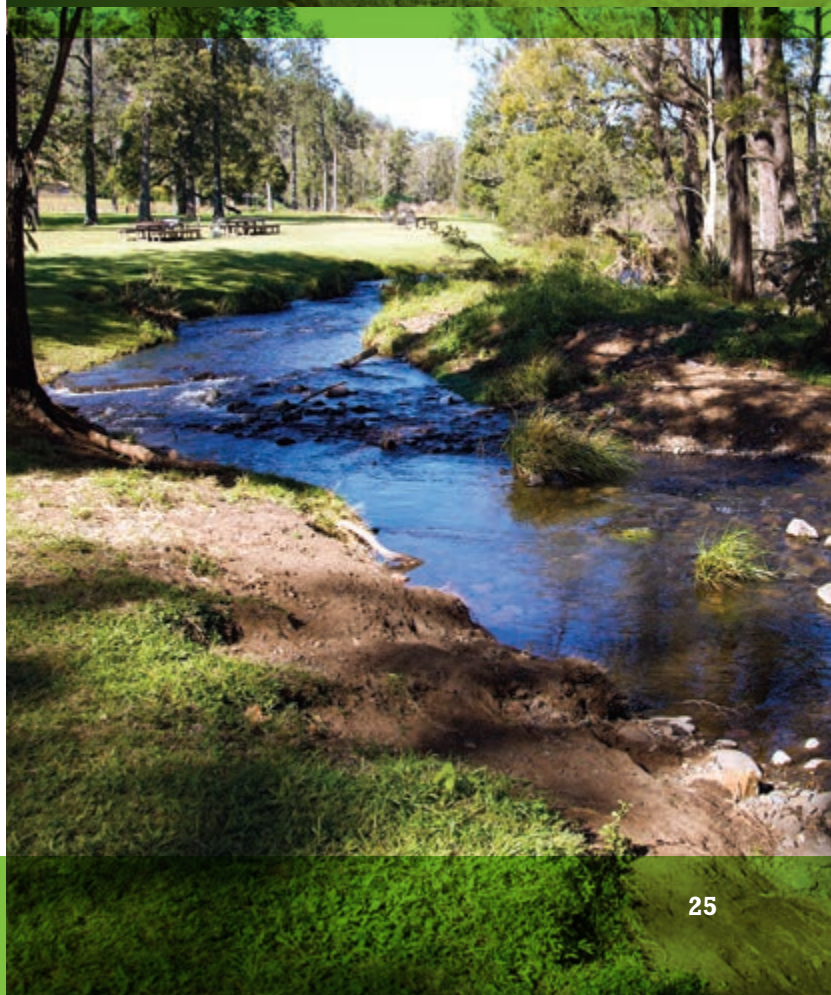
The water quality of waterways for public recreation has become an increasing concern, particularly following major rainfall events. By continuing to monitor and to investigate cause and effect, Council will be in a position to work with regional partners, state agencies and the community to inform management responses and follow-up action.

Case study: Raingardens in the city

Raingardens are simple ways to filter stormwater before it reaches our waterways. Suitable for backyards and streetscapes, these garden beds use native plants and free-draining soils to capture, filter and treat water from roofs and streets, slowing water flows, beautifying neighbourhoods and cooling the urban environment.

Stormwater run-off from urban areas is recognised as a major contributor to waterway degradation. In highly-developed areas, hard surfaces prevent natural filtration and stormwater pours straight into streams, taking pollutants such as sediment, nutrients, heavy metals, oil and grease with it. As Brisbane continues to grow, inexpensive, low-maintenance treatment devices suitable for urban areas will become even more critical to waterway health and the built urban form.

Council recently funded seven raingardens at Cavendish Road, Coorparoo and is investigating further opportunities to improve waterway health and the urban environment. Council also actively encourages residents to build their own raingardens.



Implementation

3.1 Develop a regional framework to maintain and improve the health of the region's waterways including the Brisbane River and Moreton Bay.

Context

Moreton Bay is protected as an internationally-significant site under the Ramsar Convention on Wetlands of International Importance.

Biodiversity value is impacted by the strong interactions between water, population, economic development and climate.

Since 1994, Council has been committed to keeping the bay clean, healthy, safe and productive for generations to come. This will be achieved by maintaining a major focus on local waterway management and implementing steps to improve the health of creeks, the Brisbane River and Moreton Bay.

Council has invested in stormwater management for many years. While this includes regulating how new developments interact with waterways, Council does not control other issues that impact on waterway health. This includes rural land use and run-off, Environmentally Relevant Activities licensed by the Queensland Government, licensed sewage treatment plants, state-owned infrastructure or planning areas controlled by the Queensland Government.

Council will need to take a cooperative regional approach to ensure the Brisbane River and Moreton Bay outcomes can be achieved and that Council's efforts in this area are not impacted by the actions of other government organisations.

Value

Moreton Bay's contribution to Queensland's economy has been valued at approximately $5.1 billion per year.

Nature-based tourism and primary industries are the main economic contributors with annual values of $2.85 billion and $1.4 billion respectively. These economic values are inextricably linked to waterway health.

Evidence-based policies and research provide optimisation and prioritisation of resources.

Water smart is…

providing habitat for fish and other aquatic life

preventing erosion of waterway banks

using bio-retention devices to clean the water

restoring vegetation along waterways

Action	Tactics
3.1.1 Regional and national collaboration. Work with regional and national partners and the development industry for waterway protection and management, recognising wider environmental values and Brisbane's urban context.	▸ Partner with other agencies to ensure Council's water management policies are consistent with regional, state and Australian Government requirements. ▸ Review Council's offsets policy to incorporate point source and diffuse water quality offset requirements consistent with state policies. (Links to 2.1.2) ▸ Maintain and foster new regional partnerships to deliver against the *SEQ Natural Resource Management Plan* and Queensland Government '30 year Energy and Water Plan' targets. ▸ Participate in relevant key regional and national forums and research programs as they occur. ▸ Work with regional partners and industry to develop an integrated and practical framework for waterway protection and management. ▸ Establish and implement a program of integrated incentives, enforcement, environmental offsets and capital works programs to support urban development and urban retrofits while ensuring improved waterway health outcomes. (Links to 2.1.2) ▸ Work with regional partners through Healthy Waterways to develop the Monitoring and Evaluation Framework for reporting against waterway management actions. ▸ Work with regional partners through Healthy Waterways to deliver a strong reporting model for the Ecosystem Health Monitoring program that incorporates wider environmental values and management activities.
3.1.2 Waterway investment. Develop a business case to invest in the regional waterway portfolio.	▸ Examine investment funding models and options. ▸ Identify significant or urgent windows of opportunity for targeted waterway investment that provide cost-effective 'early wins' that demonstrate the value of restoration and protection of waterways within Brisbane. ▸ Present the case for waterway investments that will 'capture hearts and minds' both within Council and external audiences. ▸ Develop an approach to assess and demonstrate measurable returns on investment that can be practically applied to the waterway portfolio.
3.1.3 Promote Brisbane's liveable and sustainable waterways. Promote Brisbane as a water smart, New World City and a leader in liveable waterways and sustainable urban waterway management to enable and encourage economic investment.	▸ Contribute learning's and showcase Brisbane at events such as the annual International Riversymposium, G20 Leaders Summit 2014, Asia Pacific Cities Summit and World Water Congress 2016. (Links to 1.1.2 and 1.2.1.) ▸ Collaborate with relevant local governments and state agencies to promote Moreton Bay as a key regional asset.

3.2 *Recognise multiple uses of waterways and their corridors to create liveable waterways and catchments.*

Context

Waterways and their green, riparian corridors are often undervalued for the many functions that they perform for our subtropical city. They are part of our natural environment and support the social, economic and cultural needs of the community.

Waterways mitigate flooding, control water movement, store and purify water, provide water for human and animal use, aid biodiversity by providing key movement corridors, support cultural connections, shade our neighbourhoods, cool the city, offer recreational opportunities and help support the economy.

Recent advances in information management systems mean Council can now pull together diverse information into a practical framework for waterway management.

Value

Safe and healthy waterways provide critical functions and are the foundation of a thriving city.

A sound decision making framework will enable Council to balance the multiple functions of our creek corridors more effectively, delivering cost-effective investment and tailored management responses. Ultimately this will support the creation of a robust funding model to support ongoing waterway investment and responses by Council and the broader community.

Action	Tactics
3.2.1 Waterways and urban liveability. Implement projects that demonstrate how waterways contribute to urban liveability, including advancing Council's Norman Creek 2012-2031 project.	▸ Continue to advance Council's Norman Creek 2012-2031 project. (Links to 2.2.1 and 2.2.3) ▸ Maintain annual monitoring and evaluation of waterway use and public perception of waterways to inform management actions and mechanisms. ▸ Demonstrate waterway liveability outcomes through Council projects including the *River's Edge Strategy*, open space planning, parks master planning, active transport projects, neighbourhood planning, flood risk management plans, Suburban Centre Improvement projects and community events, celebrations and festivals. (Links to 1.2.1, 1.4, 2.2.1 and 2.4) ▸ Develop a healthy and liveable waterways implementation plan to support the delivery of the *WaterSmart Strategy*.
3.2.2 Multiple use framework. Develop and implement a decision making framework that can be applied at a catchment and precinct scale that optimises the potential multi-use of each waterway based on its characteristics and the ecosystem functions and services it provides. (Links to 2.1.2 and 2.2.1)	▸ Ensure the value and benefits of waterways beyond their contribution to water quality is better understood. ▸ Review the methodology for site selection under the Waterway Health Enhancement program (Schedule 80) to ensure that sites are selected where multiple benefits can be achieved without high maintanence and operational costs. ▸ Develop an area-based urban retrofit delivery framework, utilising a suite of interventions that meet broader urban waterway multi-use objectives. ▸ Embed the multi-use decision making framework into Council's signature projects including Kingfisher Creek, Coorparoo Creek Park, Archerfield Wetlands, Bowies Flat rejuvenation and Stones Corner revitalisation.
3.2.3 Waterway access and activation. Support the use of Brisbane River and waterways as key recreational resources. (Links to1.2.2 and 2.2.2)	▸ Collaborate with other agencies with water management responsibilities (such as Queensland Urban Utilities) to manage safe and healthy waterways. ▸ Partner with Queensland Urban Utilities to identify and reduce locations across Brisbane where sewer overflows are known to occur upstream of areas of high social and ecological amenity. (Links to 4.4.1)

Case study: Environmental flows

Every waterway has a natural, seasonal flow pattern that supports and maintains its ecological health and function. These natural flow cycles are called environmental flows.

When cities are built these natural flow patterns are altered because increased hard surface areas increase the frequency and velocity of runoff into our urban waterways. Understanding the pressure this places on the stability of our urban waterways and their ability to function as ecological systems is vital.

Therefore Council, in partnership with Healthy Waterways, the Australian Rivers Institute, CSIRO and the Queensland Government, commenced studies to understand environmental flows of our urban waterways.

Council recognises that we have to allow for the natural hydrological cycle to keep our waterways healthy and resilient as the healthy functioning of our waterways is essential for Brisbane's long-term economic and social welfare.

3.3 Maintain the health and resilience of local waterways.

Context

With a subtropical climate and rainfall pattern, our city is interwoven by waterways that drain our urban environment and create the unique nature of the city. Brisbane has many types of waterways in varying condition. Some are pristine, highly-functioning ecosystems, while some have been highly modified through the creation of our urban environment and exacerbated by the effects of climatic extremes.

Understanding how waterways function enables Council to manage them efficiently and cost-effectively. Through the Waterway Health Enhancement program, Council constructs systems, in priority locations, to treat stormwater through processes including natural channel design, riparian planting and water smart urban design.

Poor management of sediment during construction can greatly damage local waterways, even if best practice stormwater management is implemented post-construction. Effective erosion and sediment control standards are therefore critical.

Local waterways hold a special place in the family histories and psyche of residents. A survey conducted through the Queensland Growth Management Summit (2010) showed that declining marine and waterway health was the key determining factor when deciding if population growth is advantageous to the region.

Healthy ecosystems are resilient to nature's extremes. With resilient waterways we can survive a drought or flood at minimal cost.

Value

The Brisbane community value the environment and waterway health is a key component of environmental health.

A functional and healthy waterway provides significant ecological services such as supporting biodiversity, stormwater conveyance and treatment, and liveability factors such as recreation and aesthetics. Improving the health of Brisbane's local waterways helps minimise negative impacts from urbanisation on the Brisbane River and Moreton Bay.

Water smart is…

people understanding how their behaviors impact our waterways and catchments

providing an environment where people can enjoy boating, fishing and other activities around the water

recognising that waterways are important social, economic and environmental assets

Action	Tactics
3.3.1 Best practice asset management. Implement natural asset management plans for Brisbane waterways. (Links to 2.3.2)	▸ Implement total asset management planning requirements for waterways and water smart assets. ▸ Undertake regular condition assessments and identify levels of service for natural waterways to inform maintenance, rehabilitation and enhancement requirements.
3.3.2 Maintenance, rehabilitation and enhancement works. Undertake waterway and water smart asset maintenance, rehabilitation and enhancement works. Focus on priority catchments and locations to revitalise creek systems, enhance urban green spaces and improve connections.	▸ Maintain forward capital works programs for Waterway Health Enhancement and a four-year trial of filtration systems in Oxley Creek (South), Kedron Brook (North), Norman Creek (East) and Toowong Creek (West). ▸ Review Council's existing Waterway Health Enhancement program to ensure it aligns with total asset management planning requirements. (Links to 2.3.2 and 3.3.1) ▸ Council will develop a plan in consultation with key stakeholders, including industry and community members, to build capacity for the community to become waterway and water smart assets stewards. (Links to 1.5.1) ▸ Establish an incentive program (such as sustainability grants) for water smart urban design and riparian rehabilitation works. (Links to 1.5.2 and 2.1.2) ▸ Develop a city-wide riparian rehabilitation and restoration opportunities map linked to the multi-use decision-making framework to support water quality offsets. (Links to 1.5.2) ▸ Develop a program to report on the condition of waterways and water smart assets, for example develop a rapid assessment technique that could be used every 3-5 years to inform the waterway and water smart asset management program. (Links to 2.3.2 and 3.3.1)
3.3.3 Erosion and sediment control. Ensure best practice erosion and sediment control is implemented. (Links to 1.3.3)	▸ Review Council policies and operating procedures to maintain best practice erosion and sediment control standards in Brisbane, including updating the new City Plan and updating procedures for Council works programs. ▸ Maintain education, auditing and compliance activities on Council building and development sites. ▸ Undertake evaluation, education and research to build capacity with industry and Council for the implementation of best practice.
3.3.4 Understanding waterway health. Ensure management actions for the health and resilience of local waterways are evidence based, utilising all sources of current information.	▸ Partner with key research bodies to continue to advance Council's knowledge and techniques for improving waterway health. For example through the Cooperative Research Centre for Water Sensitive Cities, CSIRO and the Healthy Waterways Partnership. (Links to 1.1.2) ▸ Translate research outcomes and apply these to Council's policies. For example to support neighbourhood planning processes, updating the new City Plan and implementing public incentive schemes. (Links to 2.1.2) ▸ Conduct special investigations as required to identify cost-effective solutions to maintain safe, resilient waterways. For example, understanding environmental flow requirements for urban streams, city-wide understanding of sediment fluxes in waterways and localised water quality studies if required. ▸ Maintain regular monitoring and evaluation of waterway health to inform management actions and mechanisms.

Sustainable water use

Sustainably managing our water, ensuring we have what we need now and for the future generations.

Outcomes

1. The community supports and uses a diverse mix of alternative water sources, improving our resilience to the effects that drought and climate change will have on our water supply systems.
2. The community uses water from all sources efficiently and effectively.
3. Brisbane's use of water from all sources is sustainable, balanced with environmental needs.
4. Brisbane's waste water will be treated cost-effectively with minimal impact on the environment.

Where are we now

Brisbane employs a whole-of-water-cycle approach to water management. By looking at the water cycle holistically within our built environment, locally and regionally, we can utilise resources more efficiently. We can optimise the existing infrastructure and systems and transition to new technologies and practices in a manner that minimises cost to the community.

In South East Queensland, Queensland Government bodies are responsible for water treatment, dams, trunk water mains and most water reservoirs. Water reticulation, sewage treatment and collection and recycled water services are primarily delivered by Queensland Urban Utilities, a local government-owned entity. Council, residents and private industry may utilise decentralised systems like rainwater tanks, greywater, stormwater harvesting systems and septic tanks. As a result, achieving the sustainable water use goal requires Council to effectively facilitate regional collaboration on water cycle management and land use planning.

Significant legislation guides the delivery of water and sewerage services. This legislation includes the *Environmental Protection (Water) Policy 2009*, *Water Act 2000*, *Plumbing and Drainage Act 2002*, *Water Supply (Safety and Reliability) Act 2008*, *South-East Queensland Water (Distribution and Retail Restructuring) Act 2012* and the *Queensland Competition Authority Act 1997*. Planning instruments and strategies also guide the delivery of these services.

Queensland Urban Utilities provides Brisbane with a safe and reliable water supply, with 100% compliance against Australian Drinking Water Standards. Queensland Urban Utilities is meeting license requirements regarding the operation of wastewater treatment plants and continues to implement strategies to reduce sewer overflows and their associated impacts on waterways.

Brisbane has responded to pressures to use its water resources more efficiently. Council has 10 stormwater harvesting sites across Brisbane and construction of another seven within the next four years is proposed. These sites use non-potable water for irrigating, reducing the demand on the potable system. Residents and businesses have also embraced the need to manage and use water efficiently.

Case study: A city of water savers

During the millennium drought of the 2000s, one of the longest known dry periods in South East Queensland's history, Brisbane became one of the most successful water savers in the developed world. Residents slashed their water usage from about 300 litres a person per day, to just 127 litres per day – even achieving 116 litres per day at one point.

Council led the way, undertaking water saving initiatives within its properties and facilities, and investing in infrastructure to support alternative water supplies such as stormwater harvesting, purified recycled water and groundwater aquifers.

Council also adopted a dual approach of educating and setting tough standards to encourage residents and businesses to raise the bar on water management. An intensive and ongoing media, advertising and communications campaign alerted community members to dropping water levels and showed them practical ways to save water. Council subsidised water saving devices such as water-efficient taps, showers and rainwater tanks and offered grants to community groups who committed to water-saving initiatives.

Within the business sector, Council implemented its Business Water Efficiency program to achieve water savings and offered incentives for innovative water management in workplaces. Developers who designed environmentally-friendly buildings and housing estates were also rewarded.

Through the combined efforts of business, government, industry and the community, great results were achieved.

Implementation

4.1 Provide safe, secure, resilient and affordable water, wastewater services and trade waste in a timely, cost-effective manner to support Brisbane's growth.

Context

Water and wastewater services underpin the city's growth and liveability. The timely provision of water, wastewater and trade waste services allows the city to grow in a form consistent with the new City Plan.

Providing safe, secure, resilient and affordable water and wastewater services are essential for the functioning of the city.

Value

Safe, secure, resilient and affordable water, wastewater services and trade waste services will reduce economic costs and the cost of living and doing business in Brisbane.

Timely water, wastewater and trade waste services will also support Brisbane's preferred development pattern.

Water smart is…

using a range of water sources

optimising operations and investment to minimise the cost of providing water

managing water demand

using water efficiently

harvesting our stormwater for non-drinking uses such as park irrigation

Action	Tactics
4.1.1 Increase industry knowledge and capacity. Increase industry knowledge and capacity to ensure the development of a sustainable infrastructure and systems program that provides affordable, sustainable outcomes.	▸ Continue to improve our understanding of sustainable water service systems and delivery through supporting and influencing groups such as the Cooperative Research Centre for Water Sensitive Cities. ▸ Continue to understand leading-edge technology and associated opportunities through participating in, and supporting, the Water Services Association of Australia's innovation forum, the Technology Approval Group. ▸ Continue to support alternative service provision technologies where suitability, given cost, standard of services, legislation and customer needs.
4.1.2 Timely infrastructure. Provide water providers clear direction of the expected growth pattern of the city to enable them to plan and optimise water and sewerage infrastructure.	▸ Provide growth projections for the city. ▸ Inform Queensland Urban Utilities of growth and changes to economic activity that may be relevant to their service provision. ▸ Queensland Urban Utilities develop a Water NetServ plan that adopts a broad-scale integrated water management approach to water and wastewater master planning and meets the need of Brisbane as a growing city. ▸ Collect infrastructure charges on behalf of Queensland Urban Utilities in accordance with their infrastructure plan and legislative limitations. ▸ Support Queensland Urban Utilities to adopt a risk management approach to minimising the impact of floods and other natural disasters on water infrastructure with the provision of flood information where available. (Links to 1.4 and 2.4) ▸ Work with Queensland Urban Utilities to ensure application of design standards and subdivision guidelines promote 'least life cycle' cost solutions and meet customer service standards.
4.1.3 Operational efficiency. Investigate and implement processes and technologies to achieve operational efficiencies and productivity gains.	▸ Work with and support the Cooperative Research Centre for Water Sensitive Cities and the Water Services Association of Australia's technology approval group to stimulate innovation. ▸ Work with regional partners to evaluate and utilise economic tools such as offsets to reduce the cost of services to our community and the environment. (Links to 2.1.2 and 3.1.1 and 4.3.2)
1.4 Plumbing and drainage. Ensure plumbing and drainage is built in accordance with the *Plumbing and Drainage Act 2002*.	▸ Complete plumbing inspections on new work as required under the *Plumbing and Drainage Act 2002*.

4.2 *Use alternative water sources to provide fit-for-purpose water, where viable and cost-effective.*

Context

When alternative water sources have a lower economic cost than traditional supplies, their use is beneficial to society.

Key costs incurred in providing alternative water supply are for water treatment and transport.

While Council may fund some viable alternative water schemes, many will require alternative sources of funding.

Value

Appropriate use of alternative water sources offers the benefit of reducing economic costs to society as a whole by lowering the base cost of fit-for-purpose water, treating stormwater and providing for passive recreation and aesthetics.

Action	Tactics
4.2.1 Efficiency of alternative water use. Use alternative water sources efficiently.	▸ Council will work with partners to ensure legislation allows for the use of alternative water sources where economically sound, socially acceptable and technically viable. ▸ Council will work with partners to develop guidelines for the efficient investment in, and use of, alternative water sources.
4.2.2 Stormwater harvesting. Support the use of stormwater harvesting where socially, environmentally and economically viable.	▸ Council will conduct a desktop assessment and map potential stormwater harvesting sites where they are found to be economically viable considering their physical location and supply capability, potential local demand, technical feasibility and financial cost. (Links to 4.2.1) ▸ Develop detailed concept designs for potential stormwater harvesting sites to confirm and expand on the desktop study. ▸ Utilise a cost benefit ratio to prioritise potential stormwater harvesting sites and develop a schedule of works. ▸ Develop a funding and implementation strategy to deliver viable stormwater harvesting projects.
4.2.3 Greywater. Support the use of greywater where socially, environmentally and economically viable.	▸ Facilitate community acceptance, and understanding of, alternative decentralised water sources through active engagement. ▸ Conduct inspections of new greywater systems. ▸ Conduct annual inspections of registered greywater systems.
4.2.4 Rainwater tanks. Support the use of rainwater tanks where socially, environmentally and economically viable.	▸ Develop support mechanisms and communication plans to support the efficient use of alternative supplies. ▸ Conduct plumbing inspections of new rainwater tanks.
4.2.5 Private sector use of alternative water. Encourage private sector use of alternative water sources.	▸ Develop guidelines, a business case and case studies to direct and encourage the use of alternative water sources. ▸ Identify potential and viable opportunities for the use of alternative water sources. ▸ Partner to deliver pilot projects to accelerate the uptake of alternative water supplies.
4.2.6 Council demonstrates use of alternative water sources. Demonstrate leadership and reduce Council's operational costs by using alternative water sources in Council buildings and urban spaces, where viable and cost-effective.	▸ Identify new supplies of decentralised water that are innovative, environmentally sensitive and fit-for-purpose. (Links to 4.2.1)

4.3 Minimise the environmental footprint of Brisbane's water and wastewater services.

Context

Water and wastewater services can negatively impact on the environment, for example, by reducing environmental flows and increasing nutrient loads in waterways. These impacts must be carefully managed to avoid reducing Brisbane's liveability and imposing excess costs on the community.

Value

Managing environmental impacts will help to maintain Brisbane's natural environment, liveability and prosperity.

Action	Tactics
4.3.1 Resource recovery. Promote and implement resource recovery strategies to increase the value and utilisation of waste products.	▸ Council will work with Queensland Urban Utilities to evaluate waste resource recovery and utilisation opportunities as they relate to Brisbane. ▸ Council will work with Queensland Urban Utilities to modify legislation, policy and licences to support the trial and implementation of waste resource recovery and utilisation where economically viable for Brisbane.
4.3.2 Utilise economic mechanisms. Utilise economic mechanisms such as environmental offsets to cost-effectively reduce the environmental impact of water and wastewater services and meet licence requirements.	▸ Council will work with Queensland Urban Utilities and other partners to develop a business case for the use of economic tools. ▸ Council will work with Queensland Urban Utilities to modify legislation, policy and licences to support the trial and implementation of economic tools. ▸ Council will work with Queensland Urban Utilities and other partners to design trial and evaluate economic mechanisms for Brisbane and the South East Queensland region.
4.3.3 Minimise wastewater overflow impacts. Council will work with Queensland Urban Utilities and other parties to minimise the impacts of wastewater overflows to the community and the environment.	▸ Council will work with Queensland Urban Utilities to remove illegal sewer connections to the stormwater system.

4.4 *Protect public health and community wellbeing through water and wastewater management practices.*

Context

A primary function of water and wastewater provision is to protect and maintain public health. Continuing high-quality public health outcomes reinforces Brisbane's profile as a highly-liveable New World City.

Value

Protecting public health and community wellbeing creates social benefits such as good community health. This has flow-on economic value such as reduced health costs, absenteeism and increased labour productivity.

Action	Tactics
4.4.1 Management of sewerage system to ensure public health. Effectively manage the sewerage system to ensure public health and community wellbeing.	▸ Queensland Urban Utilities to undertake actions identified in the Water Netserv plan to ensure the prudent and efficient planning and operation of Brisbane's sewerage system to protect public health. ▸ Council to develop a memorandum of understanding with Queensland Urban Utilities to ensure sewage spills are managed to minimise the risk of human contact. (Links to 3.2.3)
4.4.2 Investigate poor water quality results in waterways. Investigate poor water quality results that may impact on public health to identify and help manage failures in the trade waste and sewage systems.	▸ Council will conduct sterile mapping with the assistance of partners to better understand the source of pollutants. ▸ Council will work with partners to research and improve understanding of how estuaries and bacteria work in a subtropical environment.

Water smart is…

collaborating and engaging with other providers, councils and the community to ensure a secure water supply

understanding that being smart about water is more than water conservation

delivering economically-sustainable water supplies

Case study: Harvesting nature's resources

Eighteen Olympic-sized swimming pools of potable water are saved each year through Council's stormwater harvesting systems and more savings are on the way. Funding recently approved by the Australian Government's Water for the Future initiative through the National Urban Water and Desalination plan will enable Council to expand its harvesting activities into new sites including parks, sports fields and streetscapes.

Ten stormwater harvesting systems are already installed across Brisbane in places such as F.R. Caterson Park at Mansfield, Purtell Park at Bardon and Albert Bishop Park at Nundah. Each system captures run-off from roofs or surrounding lands and channels it into tanks or storage ponds for reuse in cleaning, irrigating sports fields and watering gardens.

Stormwater harvesting has multiple benefits. As well as saving clean water, it re-establishes natural water cycles, cuts down on pollutants entering the waterways and, if the design mimics nature, brings beauty and wildlife habitat to the local area.

Businesses and organisations considering installing their own stormwater harvesting system can access a 16-page booklet from Council, called *Harvesting the Potential of Stormwater*, to guide them through the decision-making and design process. Groups most likely to benefit from exploring stormwater harvesting are those that can capture, temporarily store and use large volumes of water onsite such as schools, universities and property developers of large urban developments.

Implementation pathways

The tools and mechanisms listed below outline examples of how Council will deliver actions and tactics listed in *Brisbane's Total Water Cycle Management Plan*. The delivery of the actions and tactics listed is subject to the constraints of Council's budget and resources available.

Tools/mechanisms	Purpose	Influence/target	Output/benefit
City Plan	Sets direction and standards for development and guides the built and natural shape of the city.	Development Assessment Branch, development and redevelopment activities.	City Plan, neighbourhood plans, priority infrastructure plan, waterway setbacks, codes and development standards.
Regional partnerships	To influence activities and outcomes on a regional scale where these activities and outcomes impact Brisbane's water cycle.	Queensland Government, other councils, Queensland Urban Utilities.	Council of Mayors, Healthy Waterways Partnership, state legislation.
Corporate plan, annual plan and budget	Council investment to ensure a community benefit.	Council's activities.	Capital projects, work programs, emergency response, education, community consultation, grants and subsidies.
Corporate rules and standards	Integrate work programs to support and align with Council's water smart goals where possible.	Brisbane Infrastructure, Brisbane Transport, Brisbane Lifestyle, and City Planning & Sustainability.	Policies, procedures, guidelines and design standards.
Research partnerships	Increase understanding of the water cycle to improve water smart practices for better outcomes.	Industry, research institutions, councils and Queensland Government.	CRC for Water Sensitive Cities Urban Water Security Research Alliance.
Community partnerships	To encourage and support the community's stewardship of our waterways and the bay.	Residents, community groups and creek catchment groups.	Community support to deliver on-the-ground outcomes for the city and waterways.

How do we know we are there?

Key performance indicators form an important part of the information required to measure how Council is progressing towards its goal, providing a focus for investment and feedback.

Key performance indicators have been designed for each of the four goals.

1. A water smart community

Title	Description	Current	Target		
		12/13	17/18	22/23	32/33
Community adoption of water smart behaviour.	Residents demonstrate water smart behaviour in their daily lives.	75%	80%	85%	87%
Community recognition of Brisbane as a water smart city.	The community recognises Brisbane as a water smart city.	70%	75%	80%	85%
Community preparedness for flooding.	Residents actively prepare for potential flooding.	53%	60%	65%	72%

2. Well-designed subtropical city

Title	Description	Current	Target		
		12/13	17/18	22/23	32/33
Recreational use of waterways and adjacent parks and public open space.	The community perceives waterways and adjacent parks and public open spaces as suitable for recreational use.	70%	72%	74%	76%
Performance of Council's infrastructure in giving access to waterways.	Brisbane residents rate the performance of Council's infrastructure in giving access to waterways.	64%	66%	68%	70%

3. A healthy river and bay

Title	Description	Current	Target		
		12/13	17/18	22/23	32/33
Maintain aquatic biodiversity.	Maintain aquatic biodiversity in our high ecological value waterway reaches (Shannon Weiner Index measured on 0-5 scale).	1.98	2	2	2
Riparian cover within waterway corridor.	Riparian vegetation within priority waterway corridors, as measured by extent of tree cover with functional vegetation.	63%	70%	70%	70%
Waterways are safe for secondary contact recreational uses.	Human health monitoring results are below 200 colony forming units per 100ml 85% of the time.	85%	85%	85%	85%

4. Sustainable water use

Title	Description	Current	Target		
		12/13	17/18	22/23	32/33
Alternative supplies to public space.	Number of public spaces utilising alternative supplies.	7	14	17	20

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