



YOUR VISION.
YOUR FUTURE.

Water Sensitive Hornsby Strategy

An aerial photograph of the Hornsby Shire area, showing a mix of residential, commercial, and industrial buildings, roads, and green spaces. A large, semi-transparent green map of the Hornsby Shire is overlaid on the center of the image. The text "LET'S SHAPE THE HORNSBY OF TOMORROW" is written in white, uppercase letters across the map.

LET'S SHAPE
THE HORNSBY
OF TOMORROW

Contents

Executive Summary	2	Appendices:	
1. Introduction	6	Appendix A – Workshop Methodology	48
1.1 About this report	6	Appendix B – Transition Dynamics Framework analysis: benchmarking, evidence collecting and action setting	49
1.2 What are water sensitive city transitions?	7	Appendix C – Council strategies	75
2. Hornsby's Water Story	10	Appendix D – Community ideas for action	76
2.1 Looking from the past to today	10	Table of Figures and Tables:	
2.2 Looking ahead to Hornsby's water future	15		
3. Hornsby Shire's Water Sensitive Vision	16		
4. Assessing Hornsby Shire's current water sensitive performance	20		
4.1 Hornsby Shire's WSC Indicator scores	20		
4.2 Hornsby's benchmarked city-state	22		
5. Advancing Hornsby Shire's Water Sensitive City Transition	27		
5.1 Assessing Hornsby Shire's WSC transition progress	30		
5.2 Strategies and actions for advancing individual vision themes	32		
6. Community Ideas for a Water Sensitive Hornsby Shire	43		
7. Conclusion	46		
References	47		

Executive Summary

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A beautiful, green, and thriving shire whose management of water and the environment supports clean waterways, sustainable resource use, and a healthy lifestyle that is connected to nature.

- The 50-year vision for Hornsby Shire

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The Vision and Transition Strategy for a Water Sensitive Hornsby defines a vision of a water sensitive future for Hornsby Shire, and outlines the broad steps Hornsby Shire should take to enable a transition towards its future. It is the outcome of ten months of research, analysis and engagement with 24 community champions and 34 leading thinkers from across water, planning, development and environment sections in Hornsby Shire Council.

The project developed and applied methods and tools of the Cooperative Research Centre for Water Sensitive Cities (CRCWSC) designed to consider a city's long-term water aspirations, benchmark current water sensitive performance and explore strategic priorities for the short- to medium-term that will be important in pursuing its water sensitive city vision. These approaches have helped situate Hornsby Shire on its water sensitive city transition journey and identified the critical interventions to enable progress.

Hornsby Shire's water story

Hornsby Shire is known for its beautiful and accessible natural environment; including bushland and national parks, rivers and creeklines, and native plants and wildlife. People have long been attracted to this environment, dating back to Aboriginal communities who thrived off the plentiful resources, and European settlers who utilized the land for farming and other industries. As the region became more developed, the once-pristine natural environment started to become degraded. Waterways, in particular, saw a decline in water quality and modifications to natural flow patterns due to rapid development. Beginning in the 1970s, local residents became active in voicing concerns around waterway health, commitments from Council and other organisations to take action on improving water quality as seen through the historic Statement of Joint Intent and implementation of the Catchments Remediation Rate. Hornsby Shire Council is now seen to be leading the way in implementation of water sensitive urban design. Despite this proactive approach, Hornsby Shire will need to plan wisely to adequately service a growing population in a warming and drying climate, while ensuring environmental and liveability outcomes for the region.



Hornsby Shire's water sensitive vision

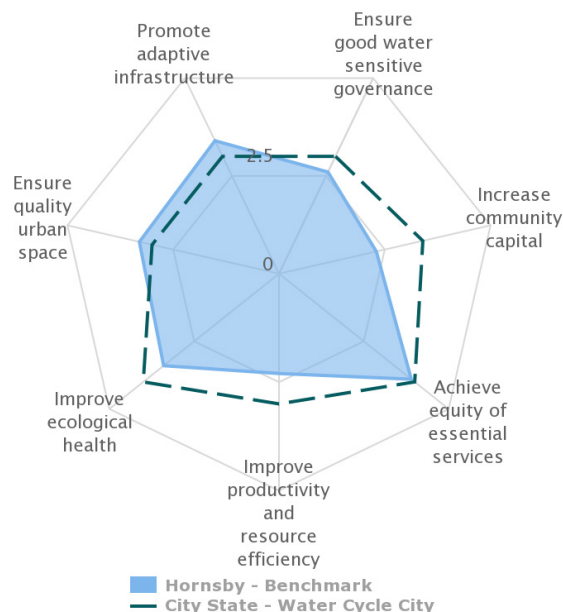
The 50-year vision for Hornsby Shire is *to be a beautiful, green, and thriving shire whose management of water and the environment supports clean waterways, sustainable resource use, and a healthy lifestyle that is connected to nature*. The vision encompasses six statements that define the outcomes to be ensured:

1. Hornsby's natural environments are healthy and thriving with biodiversity
2. Hornsby and its villages are full of beautiful blue and green spaces that connect people to their surrounding environment and local community
3. Hornsby Shire has engaged, empowered and active communities who value Aboriginal and multi-cultural connections to land and water
4. A strong focus on water management supports safe communities and healthy, clean rivers and creeks
5. Sustainable resource use is supported by integrated, multi-functional infrastructure
6. Integrated and inclusive governance arrangements deliver a holistic approach to water management while meeting the challenges of growth

Current water sensitive performance

Hornsby Shire's current water sensitive performance was benchmarked using the CRCWSC's Water Sensitive Cities Index. Hornsby Shire's performance in the Index suggests it is strongest in the goal *Equity of essential services*. Its relative weaknesses are in the goals of *Improve productivity and resource efficiency*, and *Increase community capital*.

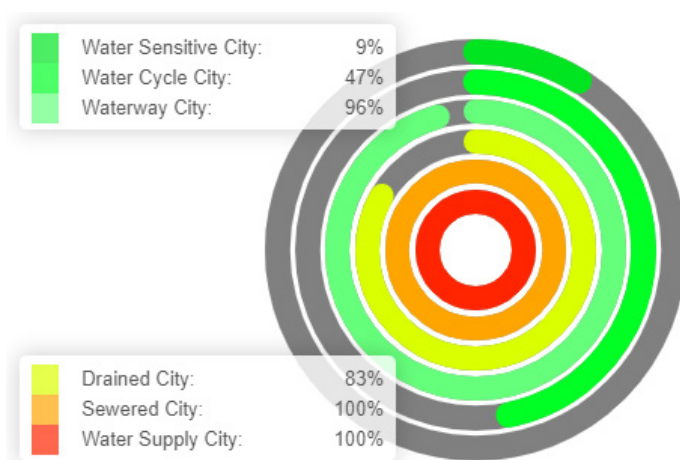
Interpreting these results against the six city-states of the Urban Water Transitions Framework highlights Hornsby Shire's high performance in the provision of water supply and sewerage. Beyond these, Hornsby Shire has shown good progress in drainage (83%), water way management (96%), water cycle management (47%) with room for further innovation to increase these ratings as it becomes more water sensitive.



Transition assessment and strategic recommendations

Hornsby Shire has a strong history of collaboration to support waterway health outcomes, underpinned by an engaged and active community and supportive Council. This foundation puts Hornsby Shire in a strong position in achieving more water sensitive outcomes. Nevertheless, for Hornsby Shire to achieve its 50-year water sensitive vision, greater emphasis will be needed on improving practices and processes for achieving integrated outcomes on the ground. To successfully progress Hornsby Shire's water sensitive city transition, 18 strategies across the six vision themes are recommended. The short-to-medium term transition needs of Hornsby Shire can be summarised by the following five overarching strategies:

1. Establish and progress an internal and cross-departmental working group to oversee implementation of the water sensitive transition strategy
2. Ensure water sensitive city outcomes are embedded in policy and planning
3. Develop new knowledge for the range of outcomes needed to deliver Hornsby Shire's water sensitive city vision (in particular community and Aboriginal engagement solutions)
4. Leverage partnerships and project opportunities to demonstrate and build the business case for multi-functional, water sensitive solutions
5. Strengthen compliance for environmental and waterway health outcomes



Acronyms

CRR: Catchments Remediation Rate

HATSIC: Hornsby Aboriginal and Torres Strait Islander Advisory Committee

WSC: Water Sensitive City

WSUD: Water Sensitive Urban Design

Disclaimer

The Cooperative Research Centre for Water Sensitive Cities (CRCWSC) was engaged by the Hornsby Shire Council to support the Council's development of this Water Sensitive Hornsby Strategy. The version of the report provided by the CRCWSC may have been modified subject to final review and approval by Hornsby Shire Council. The CRCWSC makes no guarantee to the accuracy of this report and accepts no liability if this report is used for an alternative purpose from which the original was intended, nor to any third party in respect of this report.

Acknowledgements

The CRCWSC and Hornsby Shire Council would like to acknowledge Stephen Pym Creations for creating the vision illustrations in Section 3. Visual interpretations of Hornsby Shire's water sensitive city vision are important for driving people's connection to and understanding of the vision, and the authors thank Stephen for bringing the vision to life.



1. Introduction



1.1 About this report

The Cooperative Research Centre for Water Sensitive Cities (CRCWSC) was invited to develop a water sensitive city vision and transition strategy for Hornsby Shire. The project involved applying the CRCWSC's Transition Planning Process (Figure 1) which involves a series of workshops with participants from Hornsby Shire Council, Sydney Water, and the Office of Environment and Heritage. The process for Hornsby Shire also involved a parallel community visioning process which involved three workshops with community participants.

The CRCWSC is part of the Commonwealth Government's Cooperative Research Centre Program. It partners with research, government and industry organisations around Australia in delivering its mission to help change the way urban areas are designed, built and managed with water sustainability and productivity as a central driver. The CRCWSC envisions future cities and towns, and their regions, to be sustainable, resilient, productive and liveable.

This report presents the key outputs of the process. Its purpose is to provide a framework for orienting and coordinating strategic action across the many different stakeholders who will need to collaborate for Hornsby Shire's envisioned water future to be achieved. This

document provides a snapshot of Hornsby Shire's performance and transition progress at this point in time. The strategies and actions in this report are designed to progress Hornsby Shire's transition towards a water sensitive city. It is intended that the Strategy will be re-assessed in 3-5 years to determine the impact of implemented strategies and actions, and to identify new strategies and actions to continue to advance Hornsby's water sensitive city transition. The CRCWSC is developing the tools and processes to assist with this monitoring and re-assessment.

It is anticipated that this document can be used as a resource to inform the design and implementation of strategic and operational programs of action within Council, key agencies and community groups. The outcomes of this process will also inform the ongoing development of Hornsby Shire Council's Local Strategic Planning Statement.

This report is complemented by a companion document, *Shaping a Water Sensitive Hornsby Shire: Outcomes from a community visioning process*, which documents the process, ideas and outputs of the community workshop series.

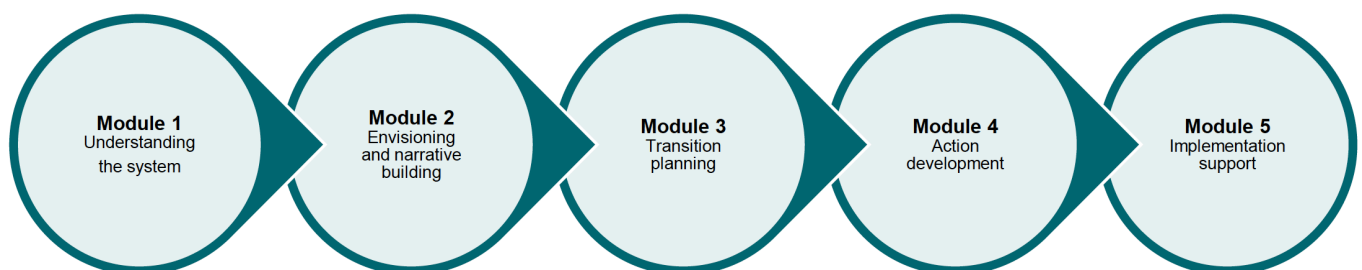


Figure 1: Description of the CRCWSC's Transition Planning Process

1.2 What are water sensitive city transitions?

As cities and towns globally are grappling with the challenges of climate change and rapid urbanisation, communities and governments are recognising the importance of water in supporting urban liveability, sustainability and resilience for a city's long-term prosperity.

In Australia, the concept of the water sensitive city (WSC) is now widely used to represent an aspirational state in which efficient, sustainable and productive water use and management is integrated throughout the urban system. Originally the concept was coined to refer to metropolitan areas but is equally relevant to regional cities. In a WSC, people can enjoy reliable water supplies, resource-efficient sanitation, protection from environmental threats, healthy ecosystems, beautiful landscapes, new business opportunities, and cultural and recreational pursuits that help build community resilience.

A WSC incorporates innovative infrastructure, design and governance solutions. For example, water recycling at different scales through wastewater recovery and stormwater harvesting provides a diversity of water sources and improves the health of downstream rivers and creeks by reducing pollution and flow impacts. Water Sensitive Urban Design (WSUD) integrates nature-based infrastructure into the landscape to provide hydraulic and water treatment functions, as well as amenity benefits such as an aesthetic environment and mitigation of urban heat island effects. Integrated and collaborative land use and water planning results in catchment-scale approaches to enhancing flood resilience and connecting areas of green and blue to create ecosystem and recreation corridors throughout the city. Citizens are active in caring for water and the environment as their sense of place and collective identity is nurtured through their connection with water.



Figure 2: Artistic representations of water sensitive city outcomes including urban greening, improved amenity, recreation, and social cohesion

Source: CRCWSC

Many places are starting to articulate aspirations represented by the WSC concept (Figure 2). Becoming a WSC involves significant changes from the conventional way of providing water services. In Australia this is characterised by centralised infrastructure that typically manages water as separate streams for supply, wastewater and stormwater. These traditional water systems have given us critical benefits such as clean water, safe sanitation and effective drainage, and this mode of servicing is still an important part of a WSC. These water systems are also jointly managed by a number of agencies and service providers, adding complexity in progressing WSCs. We now recognise that adaptations are needed to address key social and environmental vulnerabilities such as degraded waterways, uncertain and extreme rainfall patterns and growing community expectations for improved liveability.

The Urban Water Transitions Framework presented in Figure 3 depicts the evolution in water system servicing as these drivers unfold. Most cities in the world would appear somewhere on this continuum, however, a city's journey from a water supply city through to the aspirational WSC is not linear. Australian cities are typically somewhere between a Drained City and a Water Cycle City, with observable features across all six of the city-states. Where Hornsby Shire sits within this continuum is identified in *Section 4 – Assessing Hornsby Shire's current water sensitive performance*.

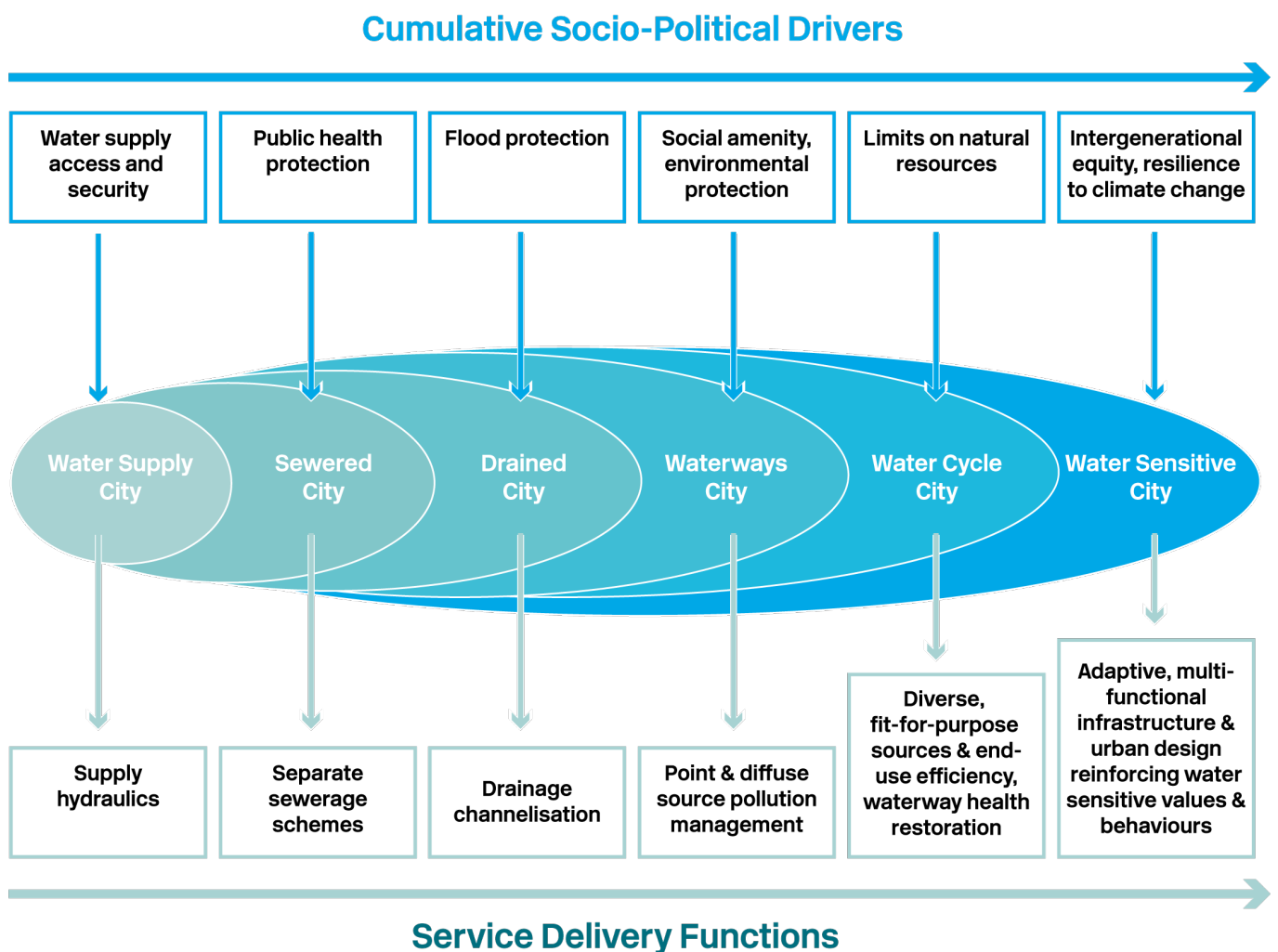


Figure 3: Urban Water Transitions Framework (Brown, Keath & Wong, 2009)



As a city moves from left to right along the Urban Water Transitions Framework, it observes a shift from traditional water management reliant on large-scale, centralised water infrastructure to a more integrated, decentralised approach involving many different types of stakeholders. Figure 4 and Figure 5 below show what a city looks like if it is in the first three phases (Water Supply, Sewered and Drained Cities) versus what it would look like if it were in the later three stages (Waterway, Water Cycle, and Water Sensitive Cities).

Becoming a WSC requires significant changes in policy and practice as the water servicing system moves through different city-states. A successful transition will therefore rely on commitment and alignment amongst many different people and organisations. Developing a shared perspective of water today, a compelling vision for the future and a framework to guide coherent strategic action is critical for establishing the understanding, motivation and capacity amongst stakeholders to drive their WSC transition. This *WSC Vision and Transition Strategy for Hornsby Shire* documents these elements and provides strategic guidance for stakeholders wanting to progress Hornsby Shire's WSC transition.

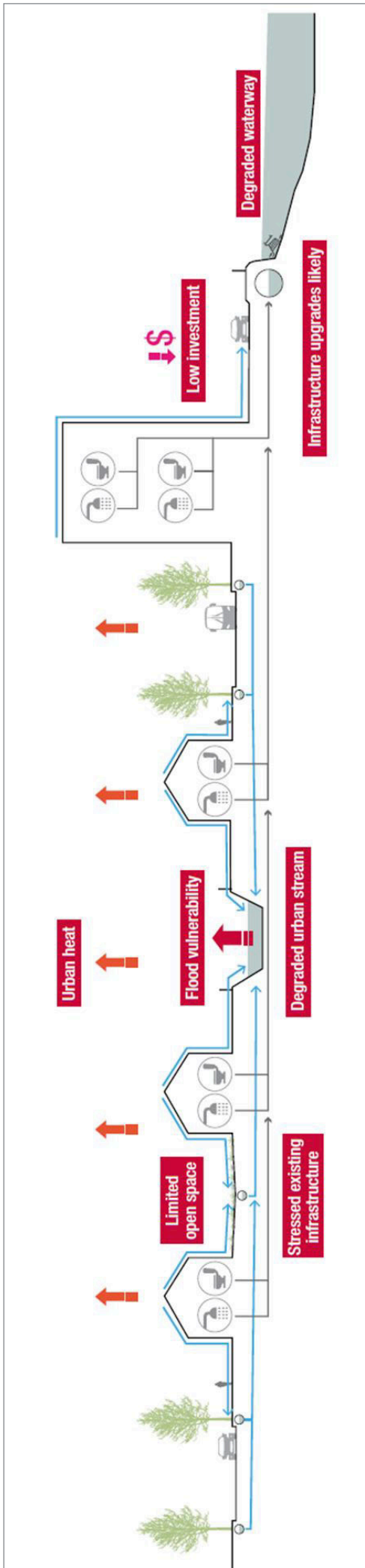


Figure 4: Profile of a city that has achieved the Water Supply, Sewered and Drained Cities (CRCWSC, 2016)

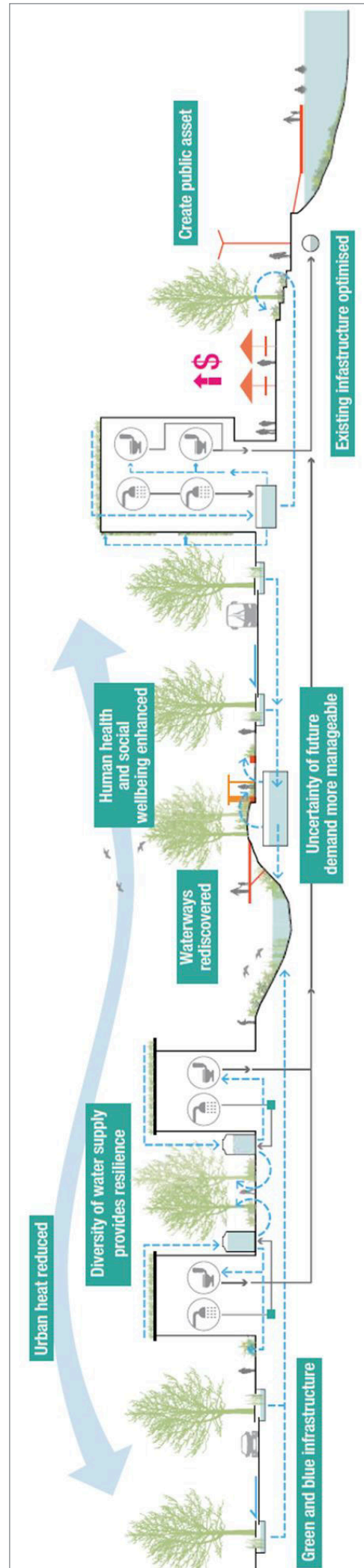


Figure 5: Profile of a city that has achieved the Waterway, Water Cycle and Water Sensitive Cities (CRCWSC, 2016)

2. Hornsby's Water Story

2.1 Looking from the past to today

When preparing for future changes, it is helpful to look to the past and learn from patterns of change and previous responses to trends and events. Engagement with both Council staff and community workshop participants focused on building a collective timeline of people's historical knowledge and experiences with water across Hornsby Shire. The following commentary is a summary of the workshop discussions, synthesised into key periods that articulate Hornsby's historical water story.

Aboriginal country (pre-1800)

For tens of thousands of years prior to European settlement, numerous Aboriginal tribes including the Gu-ring-gai and Darug people lived and thrived in the Hornsby region. The Hawkesbury River, which they called Deerubbin, was central to their way of life. Yams, a staple food, grew plentifully along the riverbanks, and both men and women fished for fish, eels, and shellfish within the river. Bark canoes were used for travel and transportation along the rivers and creeks which provided efficient transport routes between regions.

Many of the local names reflect this early connection to water, such as Deerubbin meaning "wide, deep water" and Cowan meaning "big water." A multitude of middens, engraving sites, grinding grooves and cave paintings were created along local waterways, many of which still exist today in over 200 recorded Aboriginal heritage sites.

Early European Settlement (1800 – 1950)

The Hawkesbury River was one of the first regions explored by Governor Phillip in 1789, where the rich soil seemed promising for a farming settlement. By 1794, a small settlement of 70 farmers was established in the Hawkesbury Region. The clearing of land for farming disrupted the local food supplies along with the traditional Aboriginal ways of life. The construction of farm dams also altered creeklines and natural water flow paths. Around 1800, Europeans began logging for timber, felling blue gums and ironbark's that grew along the ridges and transporting them along the river.

There were conflicts between European settlers and Aboriginal groups over land, crops and livestock.

These conflicts, coupled with the introduction of diseases such as smallpox and influenza, resulted in the loss of both Aboriginal and European lives and the removal of Aboriginal groups from their native lands.

People were drawn to the Hornsby region because of its plentiful resources and beautiful natural environment. Fertile soils, timber, land for livestock, plentiful fish and oysters, and easily navigable waterways helped support growing industries. A number of ferries began to operate to help transport people across the Hawkesbury River, and the construction of roads such as the Great North Road began to expand the connection with other settlements. The arrival of the railway in the late 1880s saw a rapid increase in population, growing to 4,700 people in 1900. People were drawn to the region due to its opportunities for work, and also for the natural beauty of the rivers and creeks. Brooklyn in particular became well-known for hosting a number of prominent ships including the *Lucinda*, on which the Australian constitution was written, and a royal yacht hosting the Duke and Duchess of York in 1901. It became so well-known that an image of the view of the Hawkesbury River from Brooklyn was used on the Federation of Australia's five-pound note (Figure 4) in 1913.



Figure 6: Five Pound note with image of the Hawkesbury River

Hornsby Council was officially established in 1906, when the first council election was held. A number of schools, churches, and the post office were constructed, creating the beginnings of modern-day Hornsby. As the town continued to grow, the night soil man or "Pan Man" provided waste collection services. However, as the population continued to grow, there was a need for more reliable and large-scale services. The early 1900s saw the construction of the first reticulated water supply and sewerage system, requiring digging and laying of pipes along Peats Ferry Road.

People continued to enjoy the beautiful natural environment for recreation such as swimming, boating and fishing in the Hawkesbury River, Berowra Creek and Fishponds Waterhole. Houses were being built along the water with access to creeks to support their desired lifestyle. Connection to creeks and waterways continued to build as more and more people were able to experience and enjoy the natural environment. The significance of the natural environment was realised and led to the creation of Ku-ring-gai Chase National Park in 1894 and the Muogamarra Nature Reserve in 1934.

Impacts on the natural environment (1950 – 2000)

The post-World War II population boom saw Hornsby council's population rise to 39,500 by 1950. Because of the population boom, the region saw a dramatic rise in land clearing and creek piping for residential development, including more roads and an overall increase in impervious surfaces. The majority of the development happened along the ridgelines, and modification to the natural topography affected the overland water flow and quality. Several large flooding events (e.g. at Crosslands, Galston Gorge) led to the construction of stormwater pipes in the 1960s to help mitigate future destructive flooding events.

As Greater Sydney continued to grow, the Water Board (now Sydney Water) expanded the infrastructure networks to meet the growing population. However, a number of wastewater treatment plants within the shire (West Hornsby Sewage Treatment Plant and Hornsby Heights Sewage Treatment Plant) were discharging effluent with high loads of nutrients, nitrogen and phosphorous into the waterways. While the urban areas were connected to the sewerage system, rural properties and townships relied on septic disposal systems, which also created issues of waterway pollution when not maintained properly. The discharge of waste and nutrients saw a dramatic decline in the water quality of the Berowra Creek, causing it and other downstream waterways to not be fit for swimming.

All of the development and infrastructure saw severely negative impacts on the once beautiful and pristine rivers and waterways. Urban development caused an increase in sediment flowing into the waterways, significantly impacting the depth of Berowra Creek. Toxic and non-toxic algal blooms and fish kills became more and more common into the 1990s, along with the presence of faecal bacteria and elevated heavy metals in marine life. The community observed this decline in waterway

health and some of the more serious events were highlighted in the press, creating public awareness around the issue. The community started to demand action around water quality in the region, first by writing letters to Councillors and Ministers and then turning to a more integrated community approach. Individuals such as Ritz Schroeder were instrumental in providing evidence and data and driving the community activism. Other active community members throughout the 1970s-1990s include Roger Campbell, Ana Pollak, Lyn & Jean Bolton, Michael Dean and Dr. David Hughes. A number of grassroots lobbying groups and progress associations such as the Association for Berowra Creek Inc., Berowra Waters Progress Association and Save the Hawkesbury's Unique River Environment (SHURE) continued to advocate for improved water quality in the region.

The *Catchment Management Act 1989* established several committees across NSW to focus on integrated catchment management. The Berowra Catchment Management Committee was established in 1994 to focus on the specific needs of the Berowra Catchment.

The government soon recognised the severity of the waterway health issue and a Statement of Joint Intent was created and signed in 1994 between Hornsby Shire Council, NSW Government, Environmental Protection Agency, (Sydney) Water Board, and the Hawkesbury-Nepean Catchment Management Trust. The statement

acknowledged the significant contribution of primary treated wastewater and urban runoff to the health of downstream waterways, and instigated a number of key actions to reduce pollution entering the region's waterways. These included the upgrade of wastewater treatment plants and Council programs to manage diffuse stormwater pollution: installation of catchment remediation devices, sediment control compliance, policy and development controls, education, catchment surveys and monitoring.

There is still significant concern from the community around the scale of development happening in Hornsby, especially the number of mid-to-high rise buildings. Residents staged a number of protests, including the 1997 Landcom protests which saw local residents blockade bulldozers beginning work on a large proposed subdivision in bushland in Berowra Valley. Council recognised the importance of retaining green space within urban spaces, and established policies to compliment the Tree Preservation Order that had been in place since 1960.

Environmental and waterway focus (2000 – 2010)

Water quality has improved dramatically since the signing of the Statement of Joint Intent. Actions undertaken include sewerage treatment plant upgrades to address point source pollution, implementation of a Catchments Remediation Rate in Council, and the construction of water sensitive urban design features (e.g. raingardens, wetlands, biofilters) throughout the council area (see Figure 7). It also included a dedicated water quality monitoring program and officers within Council to ensure outcomes were being achieved. Homeowners are now encouraged to install rainwater tanks on their property. A number of studies and plans were conducted and developed in the early 2000s (including estuary management plans, stormwater management plans, climate adaptation strategies and stormwater policies) to ensure protection into the future. Council is also beginning to look at innovative and sustainable water solutions such as stormwater harvesting systems for irrigation (e.g. Council's Community Nursery at Pennant Hills and numerous sports fields).

Although water quality improved significantly because of these actions, there has been minimal reductions in nutrients entering waterways since the wastewater treatment plants were upgraded in the 1990s (Hornsby Shire Council, 2019). This indicates that water

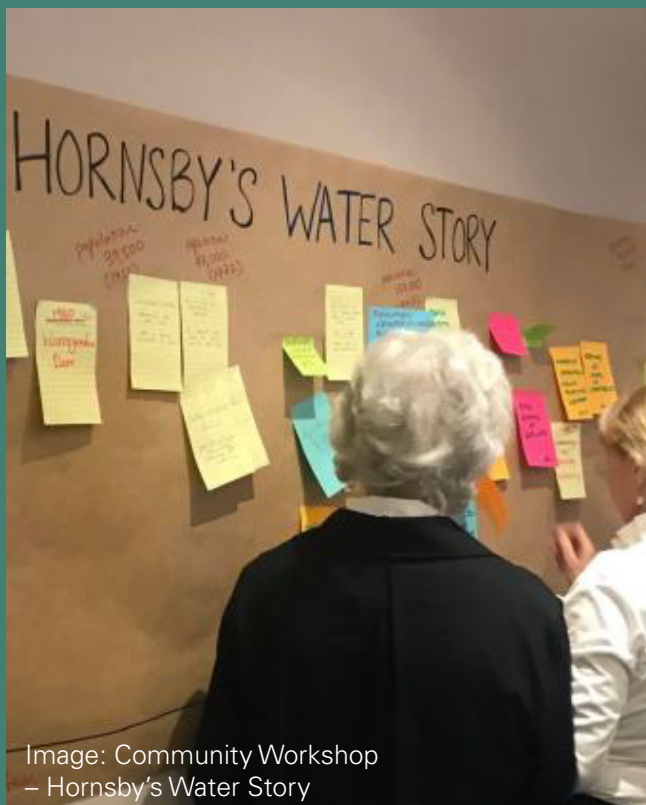


Image: Community Workshop
– Hornsby's Water Story

improvement measures being implemented by Council has offset the impacts of development over the same period. However, Hornsby Shire still faces ongoing challenges regarding impacts from new and existing development on the waterways.

One of the things people love about Hornsby Shire is that there is enough space to have large lots and spacious homes. However, this peri-urban development and the associated land clearing significantly alters natural water flows, causing hydrologic and (to a lesser extent) water quality impacts on local waterways.



Figure 7: Examples of WSUD in Hornsby Shire at Asquith and Berowra

Future liveability (2010 – 2019)

While Hornsby has been seen as a leader in the environmental and water space, it will continue to face situations that will challenge the progress that has been made. Changing government priorities, along with increasing pressure on water systems from more extreme storm events and rapid development, will require the people of Hornsby to work together in order to find new solutions to these challenges. Although the total urban area is small compared to other councils in Sydney, the location of Hornsby in the upper catchment means that unmanaged impacts will manifest within downstream high ecological value waterways. New urban development patterns such as high-rise apartment blocks are changing the character of the area and bring more diverse demographics. Urban heat within Hornsby town centres will also become a challenge as global temperatures continue to rise. While Hornsby Shire Council has already made significant advancements in the stormwater space, further action will need to be taken to ensure the region remains liveable and beautiful for its residents and that resources are managed sustainably for future generations.



2.2 Looking ahead to Hornsby's water future

Hornsby Shire is currently experiencing rapid population growth and urban development, causing a shift in demographics and character of the region. The population of Hornsby Shire is forecast to increase from 147,000 people in 2016 to 180,000 by 2036, with the main driver being migration from other areas. There will be an increase in dwellings, specifically high to medium density housing to accommodate the population growth. Increased development will impact local habitats and biodiversity corridors, along with stormwater quality and flows.

The projected population growth for Greater Sydney will have significant impacts upon Hornsby Shire through tourism, jobs, infrastructure, and other areas. A large portion of Greater Sydney's future development is expected to occur in the upstream catchments of Hornsby Shire, which will lead to significant waterway health impacts. The overall increase in people and development in the region will be a major threat to Hornsby Shire's ecosystems in the future.

The Greater Sydney region is already experiencing the impacts of climate change. Days are becoming hotter and drier, with urban heat being a major concern and its impact on people's health and wellbeing. Higher intensity storms and rainfall events will increase the risk of flash flooding, coupled with Hornsby Shire's dramatic topography could lead to significant downstream impacts. Longer periods of hot, dry weather will increase the bushfire risk in natural areas.

While these drivers are a challenge for the existing water system, they also present an opportunity to change the business-as-usual approach to water management. Hornsby Shire residents are passionate about preserving the character and lifestyle of the shire that make it a great place to live. People living in the Hornsby region love being close to nature and value the large amount of bushland and its accessibility for activities such as bushwalking. The nearby Hawkesbury River, Berowra Creek, Berowra Valley, Ku-ring-gai Chase and Lane Cove National Parks and Muogamarra Nature Reserve offer ample opportunities for people to enjoy and experience the beautiful surrounding natural environment. The rivers and creeks provide opportunities for recreation such as kayaking, boating and camping. People love the rich biodiversity of the region, especially the birdlife.

The lifestyle of the region is also a major drawcard for residents. People cherish the proximity to the city, beaches, and the mountains, along with the diversity of both urban and rural land uses. There is more open space than the city, allowing people to have bigger houses and yards, which are also more affordable. The multiculturalism and diversity of people brings rich character and vibrancy to the region. There is a strong sense of community within Hornsby and its villages, promoted through festivals, markets, and other events. A number of good cafes and restaurants add to Hornsby's vibrancy. There is strong Indigenous and European heritage in the region, with one of the largest clusters of Aboriginal carvings in Australia.

The Hornsby community values having a Council that is active in protecting the environment and having Councillors that are engaged with the community. The facilities such as schools, sports fields, play grounds and parks such as Fagan Park are valued and it is seen to be a safe area for families and children. People value the cleanliness of the region, with minimal rubbish and clean, non-polluted air. There are also many active bushcare groups and other community groups who are active in protecting the natural environment.

3. Hornsby Shire's Water Sensitive Vision

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Hornsby Shire is a beautiful, green, and thriving shire whose management of water and the environment supports clean waterways, sustainable resource use, and a healthy lifestyle that is connected to nature.

- The overall water sensitive vision for Hornsby Shire

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The 50-year water sensitive vision for Hornsby Shire aims to orient and align the actions of stakeholders over the long-term. The aspirations of project participants for their region's water future are expressed as a suite of outcome statements with accompanying rich descriptions. The 50-year timeframe enables people to stretch their ambitions beyond today's systems and constraints to reflect on the transformative change that is possible over such a period.

The overall water sensitive vision for Hornsby Shire is presented below:

Hornsby Shire is a beautiful, green, and thriving shire whose management of water and the environment supports clean waterways, sustainable resource use, and a healthy lifestyle that is connected to nature.

The six emerging themes are as follows:

1. Hornsby's natural environments are healthy and thriving with biodiversity
2. Hornsby and its villages are full of beautiful blue and green spaces that connect people to their surrounding environment and local community
3. Hornsby Shire has engaged, empowered and active communities who value Aboriginal and multi-cultural connections to land and water
4. A strong focus on water management supports safe communities and healthy, clean rivers and creeks
5. Sustainable resource use is supported by integrated, multi-functional infrastructure
6. Integrated and inclusive governance arrangements deliver a holistic approach to water management while meeting the challenges of growth

The following section outlines each individual vision outcome in more detail, providing a rich narrative that helps readers visualise what it is like in Hornsby Shire if the WSC vision is achieved. The illustrations (one per vision outcome) were designed and produced by Stephen Pym Creations and were co-developed with workshop participants.

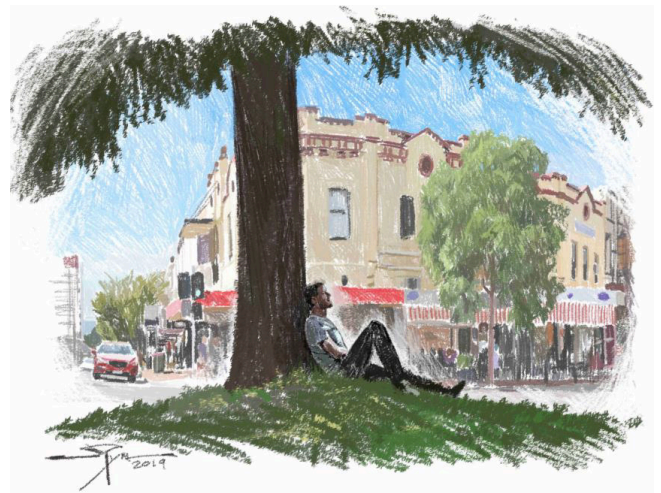
1. Hornsby's natural environments are healthy and thriving with biodiversity

Hornsby residents are surrounded by healthy bushland that supports diverse native flora and fauna. Habitats, parks and reserves are distributed throughout urban areas and connected for habitat corridors, providing safe passages for wildlife. Native aquatic species are plentiful in waterways. Programs are in place for the protection of all native species and ecosystems. Feral animals are managed appropriately in order to protect native species. People appreciate and value the biodiversity of the area and actively take part in protecting and enhancing it. Waterways are rehabilitated and protected to ensure healthy creeklines, riverbanks and riparian vegetation. Natural bushland is protected from development to ensure sanctuaries for plants, animals and natural processes. Hornsby's natural environment is supported by a biodiversity strategy underpinned by community values and reflected in local planning and legislation.



2. Hornsby and its villages are full of beautiful blue and green spaces that connect people to their surrounding environment and local community.

Hornsby and its villages are filled with networks of blue and green spaces that keep people cool, comfortable, healthy and connected. People experience and value the connection of ridgelines and valleys unique to Hornsby Shire. Streets and parks are lined with trees that provide shade and urban cooling. Water is seen and used in the landscape through fountains, ponds and vegetation so people can experience and enjoy it. A network of walkways and cycleways promote recreation and connect people to bushland, waterways and parklands for outdoor recreation. Facilities are available for people to actively use the rivers and creeks (e.g. kayaking, paddle boarding and other waterway activities). Innovative and best practice urban design creates spaces in developed areas that people want to spend time in.



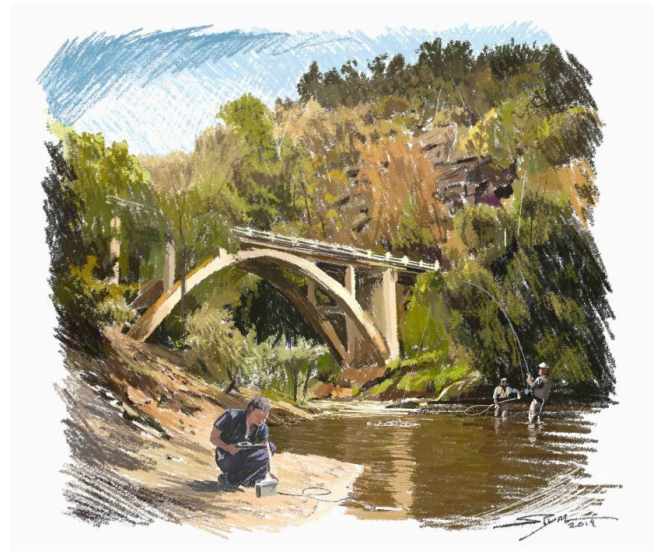
3. Hornsby Shire has engaged, empowered and active communities who value Aboriginal and multi-cultural connections to land and water

The Hornsby community is committed to sustainability which is made evident through environmentally conscious behaviours. People understand the water cycle and care about their local waterways and bushland corridors. The community is an active and valued partner in water planning and decision-making and there are processes that enable community voices to be heard. Councillors and Council staff support community aspirations and continuously engage with diverse community groups. People value the Aboriginal heritage of the area and appreciate the many diverse cultural connections to waterways. Local Aboriginal communities are appropriately engaged to share knowledge and stories, and to form ongoing relationships in working together to achieve positive outcomes for the region.



4. A strong focus on water management supports healthy, clean rivers and creeks

Hornsby's rivers and creeks are clean, swimmable, and highly valued. Because of the clean water, people visit the rivers and creeks for recreation and amenity. The high value of waterways means innovations and technologies regarding water quality treatment and flow are realised and incentivised. River-based industries (e.g. oyster farming, estuary prawn trawlers) are thriving. The quality of water is continuously improved and protected by effective catchment management, water sensitive urban design, and robust recycling programs, and is facilitated through multi-stakeholder and agency collaboration. There are minimal water quality related warnings and human-induced algal blooms, and fish and crustaceans are safe to eat. Flooding is minimised through appropriate measures that include the capture and reuse of stormwater. Everyone within Hornsby takes responsibility for and is accountable for their actions towards good waterway health outcomes (including urban and rural communities, businesses, and industries). Education programs help build community resilience and provide information on how people can help improve the health of their local waterways.



5. Sustainable resource use is supported by integrated, multi-functional infrastructure

Hornsby's water infrastructure is designed to meet the needs of both people and the environment. Infrastructure systems exist at multiple scales to deliver place-based solutions. The delivery of multiple benefits (e.g. greening, water quality, cooling) beyond traditional water services is taken into account in infrastructure design. Planning supports integration of green infrastructure with traditional grey infrastructure. Hornsby's water supply utilises diverse sources that are fit-for-purpose, which include harvested stormwater and recycled wastewater. Community members support using recycled water for household use. Innovative asset ownership models are utilised for ongoing management and maintenance. System modelling informs intelligent and real-time operation of infrastructure networks that can react to forecasted weather patterns (e.g. purging of water storage facilities when heavy rain is predicted to provide flood storage).



6. Integrated and inclusive governance delivers a holistic approach to water planning and management while meeting the challenges of growth

There is a united and shared responsibility for Hornsby's water resources and environmental health, with alignment across levels of government and across agencies. Water is managed in an integrated manner across sectors, organisations, and stakeholders, who work together to drive collaborative outcomes using the latest available technology. Internal collaboration within Council is efficient and streamlined, leading to a range of positive outcomes for Hornsby Shire and supporting the aspirations of the community.



4. Assessing Hornsby Shire's current water sensitive performance

Planning Hornsby Shire's transition to its water sensitive city vision requires a detailed understanding of its current performance in relation to its aspirations. The CRCWSC's Water Sensitive Cities (WSC) Index is a benchmarking tool designed for this purpose. It articulates seven WSC goals, which organise 34 indicators representing the major attributes of a WSC. These indicators are also mapped to the idealised city-states represented in the Urban Water Transitions Framework (Figure 3, page 5) to provide a benchmarked city-state.

While a city's local WSC vision may not emphasise all indicators of the WSC Index to the same degree, the tool enables diagnosis of key areas of strength and aspects for improvement. These insights can then inform the prioritisation of actions and provide a framework for ongoing monitoring and evaluation of a city's water sensitive performance.

4.1 Hornsby Shire's WSC Indicator scores

The WSC Index was applied to Hornsby Shire to benchmark current water sensitive performance. The benchmarking workshop was delivered in February 2019 and included 34 participants from a wide range of departments within Council, along with external organisations (including Sydney Water, NSW Local Land Services, and a number of neighbouring Councils). Figure 8 below illustrates the WSC Index goal results for Hornsby Shire (shown by the shaded blue area). Table 1 below provides the individual scores for each goal.

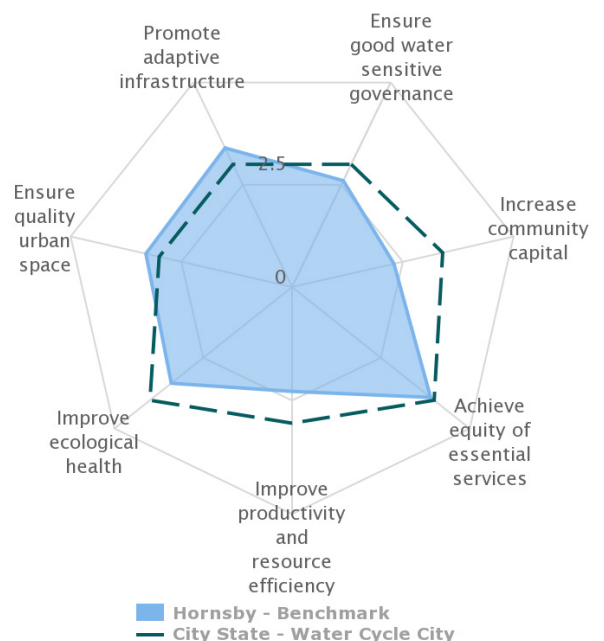


Figure 8: Hornsby Shire's WSC Index goal scores

(ideal scores for a water sensitive city would be shown by a graph that fully extends to the outer edges)

WSC Index Goal and Indicators	Score /5
1. Ensure good water sensitive governance	2.6
1.1 Knowledge, skills and organisational capacity	2.0
1.2 Water is key element in city planning and design	3.0
1.3 Cross-sector institutional arrangements and processes	3.0
1.4 Public engagement, participation and transparency	2.5
1.5 Leadership, long-term vision and commitment	3.0
1.6 Water resourcing and funding to deliver broad societal value	3.0
1.7 Equitable representation of perspectives	1.5
2. Increase community capital	2.3
2.1 Water literacy	2.5
2.2 Connection with water	3
2.3 Shared ownership, management and responsibility for water assets	2.5
2.4 Community preparedness and response to extreme events	2.5
2.5 Indigenous involvement in water planning	1
3. Achieve equity of essential services	3.9
3.1 Equitable access to safe and secure water supply	4.5
3.2 Equitable access to safe and reliable sanitation	4
3.3 Equitable access to flood protection	3.5
3.4 Equitable and affordable access to amenity values of water-related assets	3.5

WSC Index Goal and Indicators	Score /5
4. Improve productivity and resource efficiency	2.3
4.1 Benefits across other sectors because of water-related services	3
4.2 Low GHG emission in water sector	2.5
4.3 Low end-user potable water demand	2
4.4 Water-related commercial and economic opportunities	2
4.5 Maximised resource recovery	2
5. Improve ecological health	3.4
5.1 Healthy and biodiverse habitat	3
5.2 Surface water quality and flows	3.5
5.3 Groundwater quality and replenishment	3
5.4 Protect existing areas of high ecological value	4
6. Ensure quality urban space	3.3
6.1 Activating connected urban green and blue space	3.5
6.2 Urban elements functioning as part of the urban water system	2.5
6.3 Vegetation coverage	4
7. Promote adaptive infrastructure	3.4
7.1 Diverse fit-for-purpose water supply system	2.5
7.2 Multi-functional water system infrastructure	3.5
7.3 Integration and intelligent control	4
7.4 Robust infrastructure	4
7.5 Infrastructure and ownership at multiple scales	3.5
7.6 Adequate maintenance	3

4.2 Hornsby's benchmarked city-state

Figure 6 summarises the city-state benchmarking results for Hornsby Shire, which interprets the scores in Table 1 against the modelled requirements for the six phases of the Urban Water Transitions Framework (Figure 3). Percentage attainment for each city-state ranged from 100% of a Water Supply City and Sewered City to 9% as a WSC. This section summarises the key elements that contribute to the overall percentage attainment of each city-state.

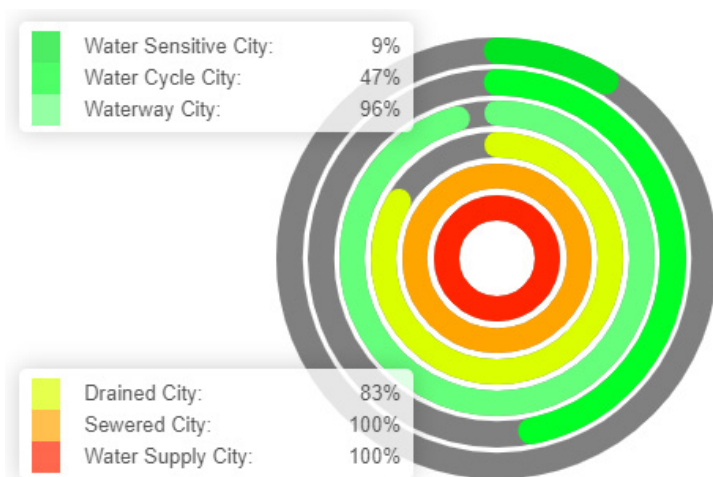


Figure 9: Hornsby Shire's WSC Index progress mapped to the idealised city-states of the urban water transitions framework

100% Water Supply City and Sewered City

Hornsby scored 100% as a Water Supply City and Sewered City. The performance assessment demonstrated that the community in the Council area has equitable and safe access to water supply and wastewater services. These services are provided by Sydney Water who operate externally under an operating license to maintain services to all customers. Some residents who live rurally or remotely along the river have access to town water and onsite systems.

While access and quality of these services were scored highly, it was noted that a small proportion of residents

rely on septic tanks (mainly in rural areas and river settlements) which can fail if not properly maintained.

83% Drained City

Hornsby scored 83% as a Drained City. Much of Hornsby is located relatively high in the catchment, resulting in a more localised flood risk than other lower lying communities in Sydney.

Drainage infrastructure is generally in a good condition and their statuses are accurately captured within GIS; however, Council has faced budgetary issues with upgrading undersized assets and largely focuses on basic maintenance rather than proactive replacement. In large storm events, nuisance flooding can cause temporary disturbance for residents and aging drainage infrastructure is very sensitive to overloading. Stormwater Management Plans have been prepared to help identify works to alleviate these disturbances.

Stormwater detention in some locations also assists in managing localised runoff. There is a gap in assessing stormwater asset compliance within private developments. An adopted Flood Management Plan would help provide strategic direction for planning and proactive replacement and redesign which is limiting the score for this measure.

To fully achieve a Drained City, scores for the following indicators will need to be improved:

Goal 3: Achieve equity of essential services

3.3 Equitable access to flood protection

96 % Waterway City

Hornsby scored 96% as a Waterway City. The Waterway City ideally provides social amenity and environmental protections through water management to support environmental health, stormwater quality/WSUD, river water quality, connectivity of blue/green assets and community connection to natural areas

The Catchments Remediation Rate (CRR), established more than twenty years ago, has played a major role in Council undertaking on-ground projects and education programs with the community, for example by participating in community-based catchment care activities.

Hornsby has a high quality and functioning network of creeklines with mostly intact corridors. These corridors are protected through geography and planning which

precludes development in steep riparian / bushland areas. There continues to be a high level of investment into catchment planning and habitat and biodiversity management with local residents and adjacent councils through reports such as the 2007 Biodiversity Conservation Strategy and the Bushland and Biodiversity Annual Reports.

The topography and large number of private landholders located adjacent to these corridors present ongoing challenges for the Council in terms of managing pest and invasive species, and in enabling public access and connection. Council continues to face land clearing through development which has spurred a renewed interest in recent years in providing adequate management and compliance policies for protecting critical habitats.

Council acknowledges that this is an area for improvement and is a driving force in its commitment to providing sustainable development including minimising its impact on the natural water cycle.

Working with private development industry stakeholders continues to be a challenge especially with regards to ensuring the intent of Council's DCP requirements around WSUD elements are met with private certification.

Greater Council involvement in state government led district level planning, and the planning of State Government infrastructure projects such as schools, would drive enhanced collaboration and ownership of significant community infrastructure projects. The relationships with adjacent councils are also positive, but ad hoc.

Local waterways are in relatively good condition and vary across the LGA spatially and seasonally. For the last two decades Council has provided good quality data regarding the condition of the key waterways and catchments within the LGA as part of the water quality monitoring program. Recent reports state that Council manages:

- Over 400 stormwater quality improvement devices (SQIDs) with active, best practice implementation and monitoring of new assets.
- Eight stormwater harvesting and reuse schemes across a variety of open spaces including sporting ovals, parks and a local community nursery.

This array of stormwater treatments, pollutant management and catchment monitoring are a strong marker for Hornsby's high score within the Waterway

City metric. To fully achieve a Waterway City, community understanding of water and their role in water management will need to be expanded to be beyond just waterway health. It should include understanding of the entire water system (both built and natural water systems) and their role within it (e.g. capturing stormwater on private land, reducing water use, etc.)

To increase percentage attainment of a Water Cycle City, scores for the following indicators will need to be improved:

Goal 2: Increase community capital

2.1 Water literacy

47% Water Cycle City

Hornsby scored 47% as a Water Cycle City. The Water Cycle City transitions from the Waterway City by focusing more on the whole of water cycle approach, taking into account collaboration across organisations and stakeholders, community literacy of the entire water cycle and opportunities for engaged and active citizens, resource recovery (including water recycling) and potable water demand, and economic and business opportunities.

Water is seen as a moderate priority for the area, with some examples of policy and development controls in place (within Council's control). Hornsby has amongst the highest water consumption per dwelling for LGAs in the Greater Sydney region. External water used in gardens on large blocks and pools has a significant influence on the increased-water use.

State agencies and Sydney Water acknowledge that there is generally a lack of strategic collaboration, with the majority of interactions with the Council being ad hoc and on a case-by-case basis. One exception to this is local disaster planning where very strong and collaborative relationship exist across a diverse number of regional stakeholders.

Water-related plans, including estuary and integrated water cycle management plans, provide constantly evolving knowledge of the water system. The Catchments Remediation Rate provide strategic guidance and resources to ensure the continual maintenance of Hornsby's stormwater system. Council also plays an active role in implementing innovative projects to help reduce flooding and prevent pollutants entering local waterways.

The community has relatively high levels of trust and

communication with the Council. Council invests heavily in understanding the perspectives of the community to inform decision making, including for local public projects. There are a number of established community reference groups, progress association and advisory committees. Not all of the community feels empowered to engage in key projects or issues unless there is a direct and generally negative impact on the individual. Some community feedback has indicated that many interactions with the community focus on short-term goals rather than a longer term vision. This is in part due to the geographical disconnection of residents to most key water assets within the shire, as many of the sites such as Bobbin Head are far removed from the primary urban and commercial centres.

Internally, the Council has a high level of water literacy of water quality management encompassed in several roles including a Water Quality Officer and WSUD Assets Officer.

While the broader community is generally well educated and has a strong connection to the 'green' image of Hornsby, the local population is growing and the demographic slowly changing is presenting new challenges for Council. Conversations with the community identify that there are relatively low levels of knowledge of different aspects of the water cycle, as well as low citizen understanding of some of the newer WSUD features and initiatives being undertaken. This is impacted by the relatively low rate of urban greenery and waterways within central districts of the Shire, a phenomenon which is common throughout Sydney's urban areas.

Local residents and the business community are reported to be gradually recognising the wider value of water and the benefits provided by the landscape, including cooling and liveability, however these actual benefits have not been quantified or regularly included in business case development.

Council has actively undertaken a range of stormwater harvesting and investigating sewer mining projects which have contributed to building local and regional knowledge and capacity. There has also been widespread adoption of rainwater tanks in new residential developments, in part driven through BASIX. Council has implemented several stormwater reuse systems, but these are sensitive to rainfall shortages and generally rely on potable supplies to maintain volume requirements.

Green infrastructure solutions have also been

implemented by the Council, despite the local steep topography in many locations constraining opportunities and public access. An emphasis on improving the density and coverage of urban green environments has been captured in the 25,000 Trees by 2020 initiative to "further strengthen our reputation as the Bushland Shire and to invest in the environment for future generations" (Mayor Philip Ruddock).

To increase percentage attainment of a Water Cycle City, scores for the following indicators will need to be improved:

Indicators to be improved:

Goal 1: Ensure good water sensitive governance

1.1 Knowledge, skills and organisational capacity

Goal 2: Increase community capital

2.1 Water literacy

2.2 Connection to water

2.3 Shared ownership, management and responsibility of water assets

Goal 4: Increase productivity and resource efficiency

4.2 Low GHG emissions

4.4 Water-related commercial and economic opportunities

4.5 Maximised resource recovery

Goal 5: Improve ecological health

5.1 Healthy and biodiverse habitat

5.2 Surface water quality and flows

5.3 Groundwater quality and replenishment

Goal 6: Ensure quality urban space

6.2 Urban elements functioning as part of the urban water system

Goal 7: Promote adaptive infrastructure

7.1 Diverse fit-for-purpose water supply system

9% Water Sensitive City

Hornsby scored 9% as a Water Sensitive City, providing a sound foundation for future initiatives. Hornsby Council has a strong organisational culture underpinning their commitment to WSCs with identifiable leaders within the organisation willing to advance processes such as the benchmarking workshop. The Council has proactively sought to use science to inform the planning and management of its natural resources. There are examples of collaboration across Council, for example, between architects, scientists and engineers, on several water-related projects. WSUD and broadly liveability and resilience initiatives are considered generally as primary benefits such as stormwater treatment and tend to be implemented on an ad-hoc, isolated basis.

Hornsby proudly recognises themselves as the 'Bushland Shire of Greater Sydney, with approximately 70% of their total land area (the largest LGA in Greater Sydney), including national parks, comprising of bushland. The community has a very strong affiliation with the vegetation in the region which constantly rates highly in terms of value in local community surveys.

This high community value and a common view that the green environment of Hornsby should not only be protected but expanded upon in urban areas has helped to drive a large number of policies to ensure their protection, including the current reviews and discussions regarding Development Control Plans and urban greening programs.

Population growth and urban intensification continues to place pressure on regulatory controls to ensure the long-term protection of the vegetation communities and their role in providing urban cooling and liveability.

The lack of higher-level strategic planning, placement and multi-purpose analysis of water sensitive assets is a major contributing factor to the overall score for this marker. Active planning and consideration of the wide range of benefits to social wellbeing, urban cooling, resilience and economic development from water sensitive designs will greatly improve Council's transition into this state.



Image: Damian Shaw Photography – *Crosslands*

5. Advancing Hornsby Shire's Water Sensitive City Transition

Hornsby Shire's transition towards a WSC will require significant changes across the structures, cultures and practices of urban and water system planning, design, management, engagement and decision-making.

These changes are likely to happen over a long timeframe, as new water sensitive practices are established and replace old practices. CRCWSC research has identified water sensitive transitions unfold over six phases: (1) issue with old practice emerges and (2) becomes more defined; people develop (3) shared understanding and agreement about the issue; (4) knowledge about solutions is disseminated; and new solutions are (5) diffused through policy and practice, and eventually (6) embedded as new mainstream practice (Figure 10).

As a city moves through each phase sequentially, enabling conditions are established to support its trajectory towards its WSC vision and avoid the risk of change pathways that reflect lock-in, backlash or system failure patterns (Figure 11).

Actions to orient and drive change towards a city's envisioned water sensitive future need to progressively establish these enabling conditions. Actions with the most impact during the early phases of transition will be different from those during the later phases. It is critical to identify a city's current phase of change to ensure that actions are prioritised according to the effectiveness they will have in accelerating the WSC transition.

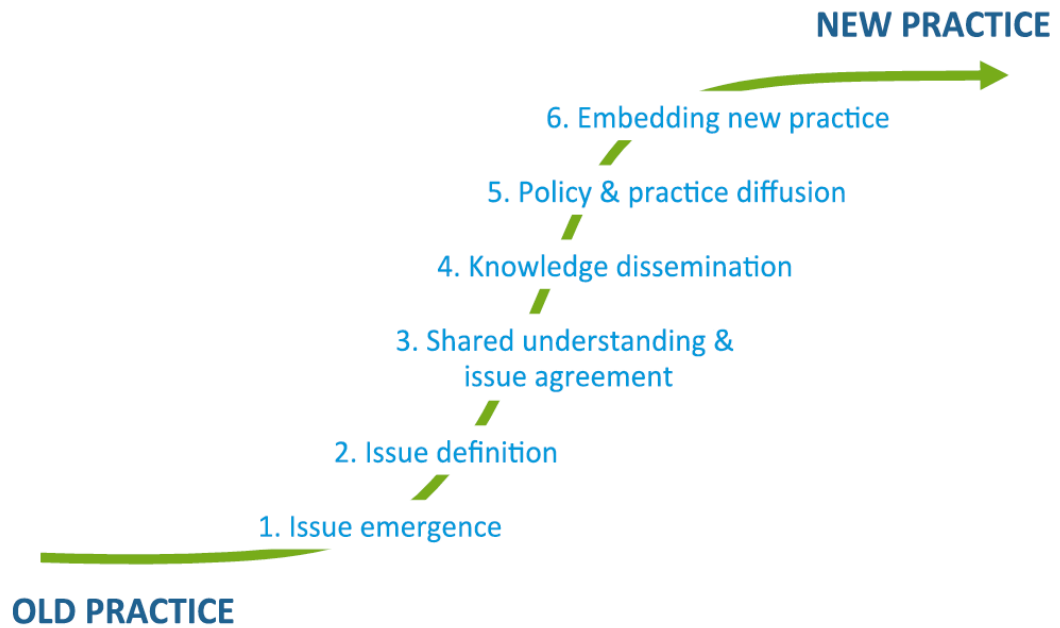


Figure 10: Six phases of change during the transition to a new practice (Brown et al., 2017)

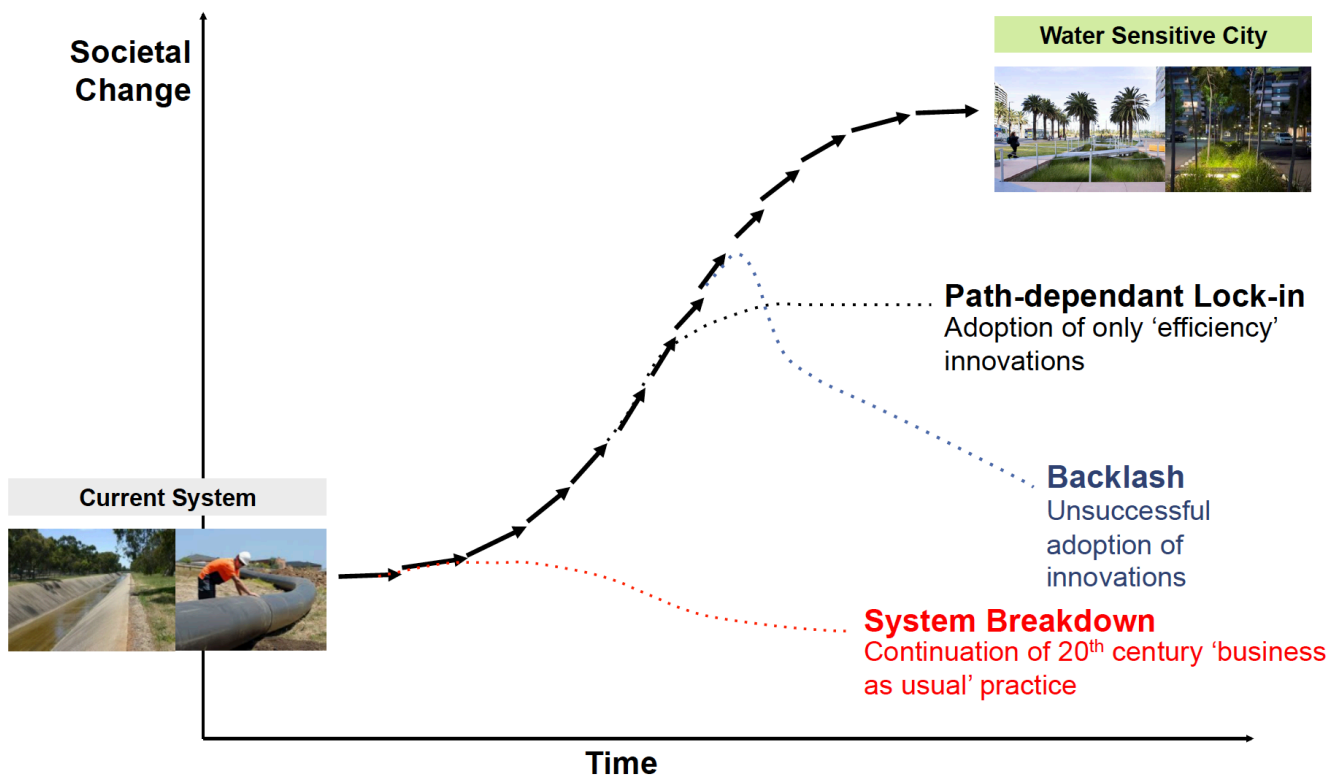


Figure 11: Transition pathways: successful transition, lock-in, backlash and system breakdown (Brown et al., 2017)

The CRCWSC's Transition Dynamics Framework sets out five types of enabling factors that help to drive progress through these phases of change: **champions, platforms for connecting, science and knowledge, projects and applications, and practical and administrative tools.**

Together, these five factors create an enabling environment for a WSC transition and, mapped against the six transition phases, they create a matrix (Figure 12) for a deeper understanding of the current transition phase for each vision outcome.

	Transition phase	Champions	Platforms for connecting	Knowledge	Projects and applications	Tools and instruments
Workshop discussions	1. Issue emergence	Issue activists		Issue highlighted	Issue examined	
	2. Issue definition	Individual champions	Sharing concerns and ideas	Causes and impacts examined	Solutions explored	
Desktop review	3. Shared understanding & issue agreement	Connected champions	Developing a collective voice	Solutions developed	Solutions experimented with	Preliminary practical guidance
	4. Knowledge dissemination	Influential champions	Building broad support	Solutions advanced	Solutions demonstrated at scale	Refined guidance and early policy
	5. Policy and practice diffusion	Government agency champions	Expanding the community of practice	Capacity building	Widespread implementation and learning	Early regulation and targets
	6. Embedding new practice	Multi-stakeholder networks	Guiding consistent application	Monitoring and evaluation	Standardisation and refinement	Comprehensive policy and regulation

Figure 12: Transition Dynamics Framework (adapted from Brown et al., 2016; Brown et al., 2017)

Definitions and examples of enabling factor types (Brown et al., 2017)

Champions refers to individual people, organisations, and/or networks that are involved in and advocating for water sensitive cities. Over time, champions expand from individual activists to scientists who expose and define key issues; then to a network of specialists who are implementing solutions on the ground; and finally to policy and decision-makers who have the power to institutionalise new practice.

Platforms for connecting refers to the structures and processes that facilitate collaboration across science, policy, and industry. Early in transitions, platforms help deepen understanding of the problem, and evolve to support implementation of solutions. Some examples of platforms include capacity building programs, internal seminar series, informal knowledge-sharing networks, or even specific projects that require a range of stakeholders.

Knowledge refers to the scientific understanding of the problem and solutions. Early transition phases involve scientific studies to define the issue, and evolve into piloting and testing potential solutions. Later transition phases involve tailoring solutions to local contexts and capacity building.

Projects and applications refers to on-ground experiments, trials and demonstrations that test and prove the viability of solution options. In early transition phases these could look like development of prototypes, and evolve into on-ground demonstration projects that serve as proof-of-concept and build trust and capacity to deliver throughout the sector.

Tools and instruments such as guidelines, policies, and regulatory and legislative instruments help to structure and embed the new practice. Early tools and instruments (beginning in Phase 3 Shared understanding and issue agreement) focus on delivering practice guidance, and evolve to focus on compliance and enforcement.

The Transition Dynamics Framework was used as a diagnostic tool to assess the presence or absence of enabling factors as an indicator of progress towards Hornsby's aspired change in practice as it advances towards its water sensitive city vision. A range of desktop and engagement activities provided data on Hornsby's enabling environment to apply the Framework.

The Framework provides a checklist of the factors that should be deliberately and sequentially built up to inform the prioritisation of strategies and actions.

Building the momentum for transition will require a diverse range of strategies and actions that progressively establish these enabling conditions. Strategies and actions with the most impact during the early phases of transition will be different from those during the later phases. It is critical to identify a city's current transition progress to ensure that actions are prioritised according to the effectiveness they will have in accelerating the WSC transition

5.1 Assessing Hornsby Shire's WSC transition progress

This section presents recommended strategies for advancing Hornsby Shire's water sensitive transition based on analysis of the city's current transition progress. These strategies are designed to address the most critical elements for advancing practice at this point in time, and it is recommended that Hornsby re-assesses transition progress in 3-5 years. Strategies are identified to advance the overall water sensitive Hornsby vision, as well as its individual thematic elements.

The overall transition progress assessment for Hornsby Shire (Table 2) suggests that significant advancements have been made towards its water sensitive vision. However, it is at risk of stagnation if critical enabling conditions are not established to shore up Phase 2 Issue Definition and start pushing into Phase 3 Shared Understanding and Issue Agreement. A brief explanation and justification of the transition assessment follows.

Transition phase	Enabling factors				
	Champions	Platforms for connecting	Knowledge	Projects and applications	Tools and instruments
1. Issue Emergence	Issue activists	N/A	Issue highlighted	Issue examined	N/A
2. Issue Definition	Individual champions	Sharing concerns and ideas	Causes and impacts examined	Solutions explored	N/A
3. Shared Understanding & Issue Agreement	Connected champions	Developing a collective voice	Solutions developed	Solutions experimented with	Preliminary practical guidance
4. Knowledge Dissemination	Aligned and influential champions	Building broad support	Solutions advanced	Significant solution demonstrations	Refined guidance and early policy
5. Policy & Practice Diffusion	Government agency champions	Expanding the community of practice	Capacity building	Widespread implementation and learning	Early regulation and targets
6. Embedding New Practice	Multi-stakeholder networks	Guiding consistent application	Monitoring and evaluation	Standardisation and refinement	Comprehensive policy and regulation
<p>Green boxes indicate the enabling factor is fully present in Hornsby and regression into the previous phase is unlikely.</p> <p>Yellow boxes indicate some presence of the enabling factor, however they are vulnerable to regressing to the previous phase.</p> <p>Red boxes indicate a complete absence of the enabling factor, and that progression is unlikely.</p> <p>Grey boxes indicate the enabling factor is not yet relevant due to absence of preceding enabling factor</p>					

Table 2: Overall transition progress assessment for Hornsby Shire

The overall assessment for Hornsby Shire suggests fairly consistent progression through the transition phases for each of the enabling factors that support change in practice.

Internal champions recognise the need for a water sensitive Hornsby Shire and the need to deliver more integrated solutions. However, this recognition has not yet expanded broadly within council and is only starting to occur with individuals in external agencies such as Sydney Water and across the Department of Planning, Industry and Environment (DPIE).

While there is some leadership on environmental issues from Councillors in the current Council, this does not yet represent the full range of WSC outcomes and can be at risk of changing when new Councils are elected (every four years), which may have differing priorities.

Collaboration to deliver broad outcomes is beginning to occur at the project level. However, further transition may be vulnerable without institutionalised alignment and other mechanisms for coherence across stakeholders. Platforms for connecting both internal and external stakeholders that create more consistent and coordinated alignment are needed to enable delivery of a water sensitive agenda in Hornsby Shire. These platforms can be formal (internal and external interdisciplinary working groups, funding for internal seminars and capacity building sessions) or informal (communities of practice or issue-specific networks) in nature.

While Hornsby Shire has a history of successful implementation of solutions for water quality, there is not yet an understanding of, or commitment for, pursuing broad solutions associated with the range of WSC outcomes. For example, solutions for engaging with diverse and changing community groups, engaging with local Aboriginal communities, mitigating downstream impacts of higher density developments, and innovative urban design. In some of these areas, there is little knowledge or data to understand why it is an issue or what needs to be done to address it. There is also the need for a business case and supporting narrative for pursuing some of these solutions.

There is currently a large opportunity to embed water sensitive principles in policy and planning through the current development of the Hornsby Local Strategic Planning Statement and the review of the Development Control Plan and Local Environment Plan. Influencing these policies and planning controls will require a strategic approach to ensure water sensitive outcomes

are embedded. This also presents an opportunity to strengthen compliance levers to ensure implementation of best practice solutions.

Based on the assessment of Hornsby Shire's overall transition progress (which is only summarised in this report) five overarching recommendations have been identified to advance Hornsby Shire's WSC transition. These recommendations are not focused on one specific outcome but are needed across the entire organisation to advance more water sensitive practice and should be considered in water planning and decision-making. The recommendations are as follows:

1. Establish and progress an internal and cross-departmental working group to oversee implementation of the water sensitive transition strategy
2. Ensure water sensitive city outcomes are embedded in policy and planning
3. Develop new knowledge for the range of outcomes needed to deliver Hornsby Shire's water sensitive city vision (in particular community and Aboriginal engagement solutions)
4. Leverage partnerships and project opportunities to demonstrate and build the business case for multi-functional, water sensitive solutions
5. Strengthen compliance for environmental and waterway health outcomes

5.2 Strategies and actions for advancing individual vision themes

Workshop discussions focused on discussing the enabling factors that are currently present for each vision outcome both within Hornsby Shire Council and also externally that would support Council's transition. Subsequent to the workshop, the CRCWSC team undertook a Transition Dynamics Framework analysis to determine the recommendations going forward. This section outlines the practice change that is required for each vision theme, a narrative around the enabling factors present or absent, and recommended strategies and actions for advancing Hornsby Shire's transition. For the detailed Transition Dynamics Framework analysis, see Appendix B.

1. Hornsby's natural environments are healthy and thriving with biodiversity

Hornsby Shire, known as the Bushland Shire, is very proud of and connected to its existing native bushland, much of which is protected in National Parks. However, as the Greater Sydney population continues to grow and development typologies shift to more urban centres, action will need to be taken to protect these natural areas of high value. To achieve Hornsby's vision of healthy and biodiverse environments, natural assets will need to be integrated into the water management system so their management can be adequately planned and resourced for the future.

Currently in Hornsby Shire there is broad understanding of the range of pressures its natural environments face – pressures from population growth and urban development. There is less known, however, on the current state of local ecosystems and the necessary responses that will need to be undertaken to ensure healthy environments for the future. A lot of this knowledge is currently being investigated through the current development of a range of strategic documents, including the Biodiversity Conservation Plan 2019, Ecohealth Catchment Monitoring and the Hawkesbury River Coastal Management Plan. There is work being done on waterway and ecological values mapping, along with monitoring programs of native flora and fauna. Work

will need to be done to consolidate and update existing biodiversity and ecological health data to form a comprehensive snapshot of current challenges and opportunities (**Strategy 1.1**).

There are many community groups who advocate for environmental protection such as Hornsby Conservation Society, Climate Change Action Group, Berowra Waters Progress Association, bushcare groups and recreation clubs. Councillors are championing environmental health. Externally, the Department of Planning, Industry and Environment (DPIE) plays an active role on collecting

environmental data at a state level. While planning controls are in place, there are often issues with compliance due to the challenges associated with resourcing and the prevalence of private certification. To achieve ecological health outcomes, compliance will need to be strengthened (**Strategies 1.2 and 1.3**). Further challenges exist in prioritising actions spatially while linking action with monitoring, compliance, education and strategic planning.

The following strategies and actions are recommended to advance more water sensitive practice:

Strategy	Actions	Outcome
1.1 Review, consolidate and update existing biodiversity and ecological health data to form a comprehensive snapshot of current challenges and opportunities	1.1.1 Develop an online mapping tool and submission form to collect data on local environmental values and conditions 1.1.2. Create an integrated database of local, state and federal environmental and biodiversity data 1.1.3. Develop and implement a program to assess condition of natural areas and gather baseline data 1.1.4. Encourage knowledge-sharing between Hornsby, Ku-ring-gai, and other councils with best practice environmental practices	A comprehensive understanding to inform context-specific solutions and responses
1.2 Develop and strengthen compliance measures at the local levels and seek to influence positive changes in state compliance measures	1.2.1. Review compliance policy procedures 1.2.2. Engage staff to improve internal capacity to fully apply legislation in a consistent manner 1.2.3. Review conditions of consent and related compliance and enforcement measures that address environmental impacts at both the construction and operational phase of development 1.2.3. Engage and lobby State and Commonwealth Government for stronger biodiversity protection laws through coalition with other councils, industry and community groups	Better compliance amongst residents and industry
1.3 Build understanding among industry (specifically developers) and residents about the importance of ecological and waterways health and incentivise compliance	1.3.1. Develop and implement proactive education programs targeting private landholders about the importance of their local waterway assets, how to protect them and what the compliance measures are 1.3.2. Develop targeted awareness campaigns for developers and residents that showcase the benefits of protecting the health of the environment (e.g. property values, business opportunities, health benefits) 1.3.3. Develop and assess incentive programs for enhancing ecological value	Better compliance amongst residents and industry

2. Hornsby and its villages are full of beautiful blue and green spaces that connect people to their surrounding environment and local community

While Hornsby Shire has plentiful native bushland, increasing urban development means that care needs to be taken to ensure the urban environments are cool, comfortable, and support health and liveability outcomes. The conventional approach to urban design typically considers water systems and the built form separately, often compromising liveability outcomes (such as aesthetic, green, cool and healthy urban environments) which rely on synergies between the built form and water system services. Achieving the vision of blue, green, cool, aesthetic and connected urban spaces require water system planning and urban planning to be more integrated and collaborative so that outcomes that link to a broader vision of urban liveability can be achieved (**Strategy 2.1**).

Recent organisational changes have seen a greater emphasis being given to place-based strategic outcomes. Numerous teams within Council are now championing the delivery of quality urban spaces, and often guide engineers and other Council staff to ensure multiple benefits are delivered. The current elected Council also supports urban greening and liveability, as seen through the 25,000 Trees Program, however there is a risk of this support being lost when Council changes. The community is also starting to call for more water play and recreation opportunities within the urban context, but there is no one driving green infrastructure such as green walls and roofs as they are not seen as a priority. Overall, ensuring quality urban spaces is beginning to take a whole of Council approach (including elected officials) as ensuring liveability in the face of increased development is now a high priority in Hornsby Shire. While there is increased support for liveability outcomes, implementation could be strengthened through better integration within Council policy and planning (**Strategy 2.3**).

Knowledge on walkability, cycling, heat and climate change is being investigated in Hornsby through the current development of a range of new strategies. Valuable knowledge is also brought in through consultants who are seen to challenge current practice and bring external knowledge. Platforms such as the Northern Sydney Regional Organisation of Councils (and corresponding executive group) support knowledge-sharing around ideas such as sporting grounds. While

there are several stormwater harvesting schemes for parks and ovals through the Catchments Remediation Rate program, there has been no focus on revitalising town centres for liveability outcomes through water. Projects (such as streets) are generally still done by rules and requirements rather than by ensuring place-based outcomes. To demonstrate how integrated outcomes can

be achieved on the ground, more trials and demonstrations for blue-green urban spaces will need to be implemented **(Strategy 2.2)**.

The following strategies and actions are recommended to advance more water sensitive practice:

Strategy	Actions	Outcome
2.1 Develop and communicate a compelling narrative around the importance of a place-based and outcomes focused approach to urban design, integrating blue and green spaces	<p>2.1.1. Develop place-based plans that incorporate a strong narrative around the local environmental, historical and indigenous heritage (informed through community engagement) and highlight linkages to other valuable networks</p> <p>2.1.2. Examine different mediums and platforms to communicate the importance of a place-based approach to deliver water sensitive outcomes</p> <p>2.1.3. Promote business opportunities in relation to recreational water activities</p> <p>2.1.4. Develop promotional material on the unique environmental and historical values within Hornsby</p> <p>2.1.5. Develop a supporting business case to articulate the economic benefit of water sensitive outcomes (e.g. urban cooling and amenity)</p>	Councillors and staff understand the importance of a place-based approach
2.2 Implement trials and demonstration projects that promote connectivity of green and blue spaces	<p>2.2.1. Assess strategic routes for green and blue corridors and ensure integration with other Council place-based strategies (e.g., Walking and Cycling Strategy, Public Domain Strategies)</p> <p>2.2.2. Capture and communicate lessons (through case studies) from demonstration projects to showcase advantages of place-based planning</p>	Demonstration of how integrated outcomes can be delivered
2.3 Identify and strengthen integrated outcomes through Council policy and planning	<p>2.3.1. Ensure integration across relevant LSPS strategies</p> <p>2.3.2. Review and update existing and future public domain guidelines and town centre plans to be consistent with water sensitive outcomes</p> <p>2.3.3. Incorporate green and blue infrastructure targets into review of Development Control Plan and Local Environmental Plan</p> <p>2.3.4. Incorporate of natural asset within Council's strategic asset management system</p> <p>2.3.5. Investigate the development of catchment specific environmental values and targets to inform the Development Control Plan and Local Environmental Plan</p>	Improved implementation for integrated, place-based outcomes

3. Hornsby Shire has engaged, empowered and active communities who value Aboriginal and cultural connections to land and water

By their nature, local governments are close to their community and engage across a broad range of issues. It has been noted that the community's knowledge of, connection with, and sense of responsibility for water as individuals and as part of the broader community has significant influence on a city's transition towards its water sensitive city vision. A successful transition will therefore require community engagement practices to be meaningful and transparent, focusing on empowering people to have the interest, capability and opportunity to be active partners in achieving water sensitive outcomes.

Hornsby Shire has a strong history of community activism, especially around water quality of the local rivers and creeks which led to a number of major policy and infrastructure improvements. There are a number of highly active environmental and bushcare groups including Streamwatch. Council runs several community engagement programs (such as tours and events, workshops, water quality reports) which mainly focus on waterway and ecosystem health and protection. More recently, Hornsby Shire Council has begun to engage with the community around the broader range of water sensitive city outcomes through processes such as the CRCWSC water sensitive city visioning workshops.

While there are good programs in place, these programs are only reaching a small group of highly motivated and committed individuals, and not successfully engaging the diverse communities that now make up Hornsby Shire. While it is recognised that the shire's demographics are changing, there is not yet an understanding of how to engage these diverse communities around a broad range of water sensitive outcomes. New solutions and processes will need to be developed to ensure messages are reaching the diversity of community groups now present within Hornsby Shire **(Strategy 3.1)**. A strategic approach to community engagement across all Council activities is also needed to ensure it receives dedicated attention and is not done ad-hoc **(Strategy 3.2)**.

While Hornsby Shire has many culturally significant water sites, the knowledge and connection amongst the broader community is generally low.

The importance of understanding Aboriginal communities' water knowledge and values in water planning and decision-making has become increasingly recognised across Australia. However, current water governance systems and processes lack the mechanisms necessary to recognise and incorporate this knowledge and values into water system services. Coupled with this is the lack of understanding of how to effectively and meaningfully engage with local Aboriginal communities. The Hornsby Aboriginal and Torres Strait Islander Advisory Committee (HATSIC) also exists to consider matters involving Aboriginal heritage or culture. This provides a good underpinning and opportunity to leverage for water related matters.

There has previously been grant funded Indigenous Officer roles within Council with a specific project delivery focus (including a cultural calendar and videos on local Aboriginal stories). Council participates in various NAIDOC week events to promote cultural connections. These existing connections or activities will need to be leveraged to identify meaningful ways of engaging with Aboriginal communities around water in Hornsby Shire **(Strategy 3.3)**.

The analysis of enabling conditions for this vision theme shows that Hornsby Shire is more advanced in its transition towards community engagement and empowerment, and less advanced in its transition towards meaningful engagement with Aboriginal communities. Therefore, two separate Transition Dynamics Framework matrices have been developed.

The following strategies and actions are recommended to advance more water sensitive practice:

Strategy	Actions	Outcome
3.1 Develop solutions for effectively engaging Hornsby Shire's diverse community groups	<p>3.1.1. Collaborate on development of Council's engagement plan to ensure it covers water engagement needs</p> <p>3.1.2. Review Council's website to ensure water sensitive resources (e.g. education, guidelines, references) are available and accessible</p> <p>3.1.3. Map current community engagement initiatives to identify gaps in engagement</p> <p>3.1.4. Investigate innovative engagement methods and principles through behaviour change research or engagement projects from elsewhere</p> <p>3.1.5. Investigate and trial methods to build peoples' connection to water</p>	Tailored engagement strategies that are appropriate for the range of demographics within Council
3.2 Build on existing platforms to ensure community engagement is embedded across all council activities	<p>3.2.1. Reinstate the education and events project control group with a clear charter and goal of providing consistent messaging and resources to community</p> <p>3.2.2. Undertake staff engagement training (e.g., IAP2) to build internal capacity</p> <p>3.2.3. Ensure water sensitive outcomes are in the charter of the Environmental Sustainability Committee</p> <p>3.2.4. Develop an Environmental Sustainability Engagement Plan to support and provide guidance on community engagement activities.</p> <p>3.2.5. Consolidate and evaluate lessons learnt from existing community engagement projects to inform future projects and to encourage innovation</p>	A strategic approach to community engagement across all Council activities
3.3 Develop new knowledge about how to effectively and meaningfully engage with Indigenous communities and why it is important to do so through better engagement with HATSIC and other Aboriginal communities	<p>3.3.1. Identify who to engage within the Aboriginal communities (beyond HATSIC) to initiate the conversation around what engagement should be undertaken</p> <p>3.3.2. Expand and progress existing internal commitments around Aboriginal community engagement</p>	An understanding of how to effectively engage with Aboriginal communities and why it is important to do so

Community engagement tools and examples

Hornsby Shire has a diverse community made up of different demographics and levels of engagement with water and sustainability outcomes. The CRCWSC has undertaken a number of research projects that developed tools and guidance for creating community engagement activities that are tailored to the local community context. A number of resources are available on the CRCWSC website including:

- Principles for engaging communities in water sensitive city transitions
- A “Water Words and Visuals” tool to assist councils in using and choosing water terminology
- A guide to promoting water sensitive behaviours
- Community profiles of engagement with water to assist in identifying targeted engagement activities
- Community Engagement in the Water Sector highlights various approaches and evaluates the effectiveness of different ways of engaging with communities

There are also a number of case studies across Australia that demonstrate exemplar community engagement to achieve water sensitive outcomes on the ground. Some of these include:

- Enhancing the Dandenong Creek – revitalising the Dandenong Creek for best community outcomes (VIC)
- Josh’s House – providing a demonstration site to inform communities on how to implement water sensitive urban design at the residential scale (WA)
- Inner West Council Community Leaders in Sustainability Course – to enable residents to develop community-based solutions to climate change and other environmental issues (NSW)
- Reimagining Bendigo Creek Plan – collaborative process to develop a vision and action plan for revitalising Bendigo Creek, grounded Dja Dja Wurrung culture and values (VIC)

4. A strong focus on water quality supports healthy, clean rivers and creeks

Hornsby Shire is seen to be leading the way in water quality management, as demonstrated through the signing of the Statement of Joint Intent in 1994 and subsequent Wastewater Treatment Plant upgrades, establishment of the Catchments Remediation Rate, implementation of WSUD, and formation of community reference groups. While these actions had significant impact on water quality within the creeks and rivers, there is still work to be done in mainstreaming this practice beyond the core group of water quality champions and ensuring everyone plays their part.

The Natural Resources Team within Council is championing waterway health and currently supported by the elected Council. The team is responsible for planning and implementing water sensitive urban design projects. There are a number of technical workshops and trainings to build capacity of staff to implement water sensitive urban design. While water sensitive urban design is being implemented across council (rain gardens, stormwater harvesting), there are some instances of failure, such as the La Mancha Estate in Berowra, due to the lack of long-term compliance and poor community engagement to foster ownership. These examples can be studied to ensure the success of future water sensitive urban design projects (**Strategy 4.3**). Specific staff within Sydney Water also support water quality solutions. Community groups such as Streamwatch are also seen as champions. People who live along the creeks and rivers also feel very connected to the waterways as they are a crucial element of their lives. More work can be done to build the community’s capacity to participate in water management and implement water sensitive solutions on private property (**Strategy 4.1**).

There is a lot known about waterway impacts close to the source and the impacts of some land uses as outlined in the Waterway Health Review 1995-2017 (Hornsby Shire Council 2019). This review details findings from Hornsby Shire’s water quality monitoring program, one of the most intensive monitoring programs undertaken by any NSW local government. The review states that some long-term improvements in water quality have been achieved, however nutrient loads continue to be an issue from upstream development and also treated wastewater discharge. Water quality probes provide real-time data on water quality throughout the catchment which allows Council to communicate to

residents on current conditions and to respond to quick environmental changes (e.g. algal blooms, impact from stormwater runoff on swimming sites). There is also work being done in understanding community values around waterways. Less is understood about impacts of higher density developments, and impacts further down the catchment, which will need to be further explored **(Strategy 4.2)**. There is also high uncertainty around potential future solutions, including things such as climate change, community sentiment, and resourcing. The actions within the current Total Water Cycle Management strategy are being progressed, and while there are compliance

programs in place, insufficient resourcing has resulted in the lack of adequate implementation **(Strategy 4.4)**. Delivery of improved water outcomes will also require water management to be positioned at the forefront of Council policy and planning **(Strategy 4.5)**. While there is a lot of action happening to ensure good water quality of the region, more can be pursued in the areas of groundwater monitoring, environmental flows and utilising smart technology

The following strategies and actions are recommended to advance more water sensitive practice:

Strategy	Actions	Outcome
4.1 Build on existing platforms to support knowledge-sharing with the community around how their behaviours can influence water quality	4.1.1. Understand and map existing behaviours among community and developers related to water quality 4.1.2. Identify how council staff and operations can influence the community's water sensitive behaviour 4.1.3. Develop a community engagement plan on natural resources management (incorporate into water management) 4.1.4. Develop specific education and engagement programs to address behaviours and outcomes	The broad community understands their role in improving water quality and undertakes behaviours to support this
4.2 Develop understanding of downstream cumulative impacts of different land uses (e.g. high density development)	4.2.1. Develop catchment models to assess policy settings and development scenarios 4.2.2. Engage with the community and state agencies to articulate and refine waterway objectives and values 4.2.3. Engage with state agencies to collate monitoring data to support catchment models 4.2.4. Develop visualisations from catchment models to assist communications and decision-making	An understanding of how certain development scenarios will impact downstream environments
4.3 Learn from previous successes or failures to inform implementation of water sensitive projects	4.3.1. Review and audit the effectiveness of planning instruments (e.g., DCP provisions) to restore and protect waterways 4.3.2. Review and compile lessons learnt from existing Water Sensitive Urban Design projects 4.3.3. Build expert 'communities of practice' to share knowledge and perspectives on water management and to co-create pathways and solutions to improve water management practices	An understanding of how to strategically implement water sensitive city projects (including incorporating the necessary community engagement around the solutions)
4.4 Develop and strengthen compliance measures at state and local levels	4.4.1. Implement a proactive education and compliance program to target industries and activities identified as having the potential to harm waterway health 4.4.2. Provide information on Council's website on minimum acceptable practices by industry type	Improved compliance for waterway health outcomes
4.5 Prioritise water management at the forefront of Council policy and planning	4.5.1. Review and adopt planning policies that elevate water management in planning decisions 4.5.2. Engage with strategic planning to ensure outcomes from catchment modelling to influence planning decisions 4.5.3. Review council systems and processes to ensure integration of Council water strategies and policies outside of LSPS process (e.g., catchment plans)	A supportive policy and planning environment for implementation of water sensitive outcomes



5. Sustainable resource use is supported by integrated, multi-functional infrastructure

The traditional approach to water infrastructure focuses on conveyance of water through a city without exploring opportunities for localised reuse and alternative water supplies. A more intelligent, multi-functional approach to water infrastructure will require highly collaborative systems and processes to enable the sharing of costs, benefits and data. This approach can also help take advantage of synergies across water, energy, food, nutrients and waste to maximise outcomes for a place.

The Natural Resources Team and Parks Team within Council have begun to work together on delivery of stormwater harvesting projects for irrigation of sports fields. The recently established Strategy and Place team is now looking at place-based projects for better integration. Opportunities or forums to explore how a place-based approach can deliver broad outcomes should be identified (**Strategy 5.1**) and demonstrated on the ground (**Strategy 5.2**). There is real-time monitoring of stormwater harvesting data to inform irrigation however this information is not accessible to parts of Council. There is also monitoring of water quality through the water quality probes, which informs communications with residents around water quality warnings.

There is seen to be a disconnect between traditional water infrastructure and WSUD, because of the fact that the funding comes from different resources. While there are 10 stormwater harvesting projects throughout Council, these have been implemented because of the link to water quality and impact on waterways. The resources are not currently available (however could be grant funded) for projects that expand beyond water quality. BASIX has overall driven positive outcomes for greenhouse gas emissions and water performance compared to other states, however it could be strengthened to address broader planning issues around urban heat and water sensitive urban design. Council should therefore advocate for a review of BASIX to expand its performance criteria to capture these issues and to improve its usefulness as a tool for broader community education and awareness on sustainable and water sensitive housing.

The following strategies and actions are recommended to advance more water sensitive practice:

Strategy	Actions	Outcome
5.1 Establish a forum for exploring how a place-based approach can deliver broad outcomes (e.g. LSPS development process)	5.1.1. Identify appropriate platforms to implement water sensitive solutions in place-based planning 5.1.2. Use tools to quantify multiple benefits and develop business cases for water sensitive solutions 5.1.3. Advocate for a review of BASIX to include broader planning issues 5.1.4. Identify opportunities to deliver multifunctional water infrastructure to the highest design standard as part of future precinct plans or place plans 5.1.5. Investigate incentives for the community and developers to develop integrated water sensitive outcomes on private land.	Understanding of why a place-based approach is important for ensuring broad outcomes
5.2 Explore opportunities to demonstrate how existing and new water management projects can deliver broad benefits by engaging with community values	5.2.1. Investigate how Hornsby Town Centre and other priority planning areas can demonstrate water sensitive outcomes through co-design with the community 5.2.2. Identify opportunities for water sensitive solutions through council works projects at the street, park and sub-catchment scale	Demonstration of how water quality projects can contribute to broad water sensitive outcomes

6. Integrated and inclusive governance arrangements delivers a holistic approach to water management while meeting the challenges of growth

Water quality and environmental health have historically been strong drivers for Hornsby Shire, as seen through the establishment of the Statement of Joint Intent and the Catchments Remediation Rate and corresponding delivery team. While these arrangements have led to positive water quality outcomes for the region, they do not address the broad range of outcomes that are present in Hornsby Shire's WSC vision. In order to transition to a WSC, broad water outcomes will need to be integrated into Council's planning and decision-making at multiple levels and the focus shifted from water quality to holistic water cycle management, with water management embedded into all decision-making.

The need for more integrated water governance has been recognised, and is being implemented through project control groups on significant projects within Council. A number of programs and committees also exist that promote collaboration such as the current development of the Local Strategic Planning Statement, the community groups instrumental in the Statement of Joint Intent (e.g. Berowra Water Progress Association), and various external committees such as StormwaterNSW and the CRCWSC Regional Advisory Panel. While collaboration is recognised as important, there are not yet the mechanisms for ensuring collaborative and integrated approaches beyond specific projects. These opportunities will need to be investigated **(Strategy 6.1)**, particularly building off existing mechanisms for collaboration **(Strategy 6.2)**.

The following strategies and actions are recommended to advance more water sensitive practice:

Strategy	Actions	Outcome
6.1 Investigate and explore options to implement collaborative governance (both formal and informal) beyond project-specific activities	<p>6.1.1. Implement internal capacity-building activities to build breadth of knowledge within Council staff</p> <p>6.1.2. Review development approvals process to ensure water sensitive planning requirements are being applied consistently and effectively</p> <p>6.1.3. Evaluate the effectiveness of existing collaborative governance solutions and approaches in delivering good water sensitive solutions</p> <p>6.1.4. Deliver water sensitive city messaging to senior and executive staff and Councillors</p> <p>6.1.5. Ensure water sensitive outcomes are at the forefront of decision-making by making it a mandatory in agenda item for all relevant project control groups</p> <p>6.1.6. Establish an informal regional water sensitive cities group that utilises online tools and forums to share knowledge and ideas</p>	The mechanisms and processes exist to support collaboration beyond individual projects
6.2 Build on existing platforms for collaboration beyond specific place-based projects	6.2.1. Develop theme-based control groups (e.g. water or environmental sustainability) that include officer and senior level staff	The project control group model is elevated to the program level to ensure consistency and longevity

6. Community Ideas for a Water Sensitive Hornsby Shire

The *community workshop series* identified a number of ideas for achieving Hornsby Shire's WSC vision. These ideas were organised into five pathways for action, which collectively guide change to achieve the vision. The five pathways include 1) improving water quality and flows, 2) informing and educating citizens, 3) connecting people and place, 4) greening urban areas, and 5) creating healthy habitats. There were 28 ideas generated that range in scope and scale (a full list can be found in Appendix E). Four actions emerged as priorities for the next 1-2 years, which include:

1. Provide financial incentives (e.g. rebates, subsidies) to implement water sensitive urban design solutions on private property;
2. Create community gardens and urban gardens to support knowledge sharing and a sense of community;
3. Develop education programs for different parts of the community that outline what actions they can take to conserve water in the home and live more sustainably; and
4. Link schools and groups (e.g. Scouts) to local environmental projects.

Achieving the vision for a water sensitive Hornsby Shire will require Council, community members, and other agencies to work together to implement the actions in this strategy. The community workshop participants began to identify how the necessary stakeholders can begin to work together to get these priority actions implemented over the next few years.



What can the community do?

- Advocate for WSUD solutions (e.g. rainwater tanks, rain gardens) and incentive programs;
- Perform home inspections to ensure water systems are not leaking and that rainwater is utilised for appropriate uses;
- Advocate for community gardens to be implemented in schools so that children can participate and learn about the environment;
- Share information on water sensitive behaviours through personal networks (e.g. using buckets to collect water when the shower is warming up);
- Keep up-to-date with local projects and if they are suitable for schools;
- Stay informed on local community group interests; and
- Approach Council to support implementation of environmental and waterway health projects.

What can Council and the community work together to deliver?

- Develop an incentive program for WSUD and communicate it to the community;
- Council provide resources to help the community identify and implement water solutions for the WSUD incentive program;
- Allow and promote verge gardens that incorporate WSUD elements;
- Promote existing volunteer programs to include environmental and water projects;
- Council provide resources and education materials to the community to help identify and implement water efficient/saving solutions;
- Provide a point of contact within Council that provides advice and information on water efficiency solutions;
- Hold events that showcase water-related projects and promote education (e.g. morning teas, barbeques);
- Determine the most appropriate communication methods for diverse community groups;
- Undertake and support citizen science projects;
- Take advantage of windows of opportunity for community capacity building;
- Utilise billboards for emotive water messages and water campaigns or slogans;

- Offer sprinkler swaps and shower timer giveaways;
- Encourage people to act on and report illegal dumping or littering;
- Council continuously fund environmental community projects, e.g. water efficiency, to ensure longevity and success of projects;
- Provide resources and support for environmental projects (e.g. guest speakers);
- Work actively with community groups to promote and encourage grants for projects.

How can Council and other external organisations enable the implementation of these actions?

- Develop a coordinated incentive program across Council, Sydney Water, and private contractors;
- Engage with Department of Education to incorporate community gardens and environmental projects in schools;
- Link with existing groups such as Lions Club and Rotary;
- Link with research around behaviour change (e.g. CRCWSC research) to create targeted and effective messages around WSCs;
- Coordinate messaging and communication channels across organisations;
- Work with and identify projects with the National Parks and Wildlife Service;
- Utilise existing groups such as Rotary, Lions Club, Men's Sheds, Country Women's Association, Rural Fire Service;
- Council works with Government agencies to create an Environment Day dedicated to working on environmental community projects.

7. Conclusion

Hornsby Shire has a strong foundation in its WSC transition, as seen through its history of community activism and action on waterway health. People value the “Bushland Shire” and feel a strong connection to their surrounding environment and waterways. In the face of a changing climate, rising population and urban development, Hornsby aspires to retain these values and to continue being a liveable and sustainable region in the future. Ensuring these outcomes over the long-term requires action to be taken now to avoid negative trajectories and to steer Hornsby Shire’s development towards its future WSC vision.

This report marks the culmination of a workshop series that brought together 20 community champions and 25 leaders and strategic thinkers from across Hornsby Shire Council, Sydney Water and Department of Planning, Industry and Environment. The workshops aimed to explore current water issues and opportunities within Hornsby Shire, understand the region’s unique water story, envision a future water sensitive Hornsby Shire and develop the transition strategies and actions that will need to be pursued to progress their WSC transition.

This vision and transition strategy is intended to provide a framework for Hornsby Shire Council to guide its action and implementation. The CRCWSC can assist Hornsby Shire in this next implementation phase through the provision of tools, strategic advice, facilitation of further processes and sharing of lessons from other places. Specific ideas for this can be found in Section 6.

Workshop participants from both industry and the community demonstrated openness, motivation and commitment for water sensitive outcomes and collective action. Building on this momentum and broadening industry and public support will put Hornsby Shire in a strong position to accelerate its ongoing transition to achieve its water sensitive vision and support the region’s future liveability, sustainability, productivity and resilience.

References

Berowra Catchment Management Committee and Hawkesbury Nepean Catchment Management Trust (1998). *A new legend: the story of the Berowra Creek Community Contract*. CultureShift.

Brown, R.R., Keath, N., & Wong, T.H.F. (2009). Urban water management in cities: Historical, current and future regimes. *Water Science & Technology*, 59(5), 847-55.

Brown, R.R., Rogers, B.C., & Werbeloff, L. (2016). *Moving toward Water Sensitive Cities: A guidance manual for strategists and policy makers*. Melbourne, Australia: Cooperative Research Centre for Water Sensitive Cities

Brown, R.R., Rogers, B.C., & Werbeloff, L. (2017). A framework to guide transitions to water sensitive cities. Chapter 9 in Moore, T., de Haan, F.J., Horne, R. & Gleeson, B. (Eds) *Urban Sustainability Transitions: Australian Cases – International Perspectives*. Springer, Japan.

Cooperative Research Centre for Water Sensitive Cities (2016). *Opportunities for a Water Sensitive Greater Sydney: the importance of water in our city's future*. Melbourne, Australia: Cooperative Research Centre for Water Sensitive Cities.

Hammer, K., Rogers, B.C., Chesterfield, C., Church, E., and Gunn, A. (2018). *Vision and Transition Strategy for a Water Sensitive Greater Sydney*. Melbourne, Australia: Cooperative Research Centre for Water Sensitive Cities. Hornsby Shire Council.

Hornsby Shire Timeline. Retrieved May 2019. <https://www.hornsby.nsw.gov.au/library/catalogues-and-resources/local-history/history-of-hornsby-shire>

Hornsby Shire Council (2019). *Waterway Health Review Hornsby Shire Council (1995-2017)*. Report prepared by the Natural Resources Branch of Hornsby Shire Council.



Appendix A

– Workshop Methodology

Workshop 1 – Benchmarking

Workshop 1 was held on 19th February 2019 and aimed to benchmark Hornsby Shire's current water sensitive performance using the WSC Index. The WSC Index benchmarking workshop was delivered by the CRCWSC and Alluvium Consulting. The WSC Index consists of seven goals and 34 indicators that define what it means to be a water sensitive city, along with rating guides to score each indicator from 1-5. The workshop worked through each indicator for Goal 6 Quality Urban Space as a whole group, then split into two concurrent sessions where one room scored the biophysical goals (Ecological health, Productivity and resource efficiency, and Adaptive Infrastructure) and the other room scored Socio-political goals (Community capital, Equity of essential services, and Good water sensitive governance). At the end of the workshop, the scores were presented to the group.

Workshop 2 – Visioning and narrative building

Workshop 2 was held on 30th April 2019 and aimed to develop a shared water story and 50-year future vision for Hornsby Shire. The first activity for participants involved identifying key moments that have shaped Hornsby's water story, whether in the form of changes to technical systems, developments in policy, programs or laws, environmental events, community trends, or personal memories or anecdotes. Participants identified these through a large timeline on the wall and sticky notes.

The envisioning activity began with a group discussion of what participants love about living in the Hornsby region, then explored the possible futures for Hornsby through a creative activity involving writing newspaper headlines to accompany a profile of Hornsby. These headlines were either positive and desirable, or undesirable and were grouped into themes by the facilitators as they were submitted. The final activity of the workshop involved expanding on the thematic vision statements of the previous activity with annotations regarding what the daily experiences of living in this image of the future might be.

Workshop 3 – Exploring priorities and strategies

Workshop 3 was held on 8th August and focused on refining and validating the water story and vision, and identifying the priority focus areas for Hornsby's water sensitive city transition. The first activity involved reviewing and refining the draft vision at tables, focusing on making the vision more relevant to Hornsby Shire and ensuring all ideas were captured.

The second half of the day focused on reviewing transitions theory and analysing the enabling environment for progressing the vision. Tables were split into vision outcomes and participants explored the presence or absence of enabling factors: champions, platforms for connecting, science and knowledge, projects and demonstrations, and tools and instruments.

Workshop 4 – Action planning

Workshop 4 was held on 10th September and focused on reviewing and refining the recommended transition strategies, and developing actions for implementation. The first activity re-visited the vision and made minor adjustments to the high level statements. The transitions analysis was then presented along with the recommended transition strategies. The rest of the workshop day focused on developing actions associated with the transition strategies, along with roles and responsibilities, timeframe, anticipated cost and impact of each action.

Appendix B – Transition Dynamics Framework analysis: benchmarking, evidence collecting and action setting

This appendix presents the Transition Dynamics Framework (TDF) process that underpins the analysis and development of strategies and actions for each vision theme presented in Section 5. The process for undertaking the Transition Dynamics Framework consists of the following steps:

1. Identify practice change

The practice change was discussed and identified for each vision theme during small group discussions in the Council staff workshop. In order to determine the practice change, each group first identified what the issue with current practice was that prevented the vision theme from being achieved. The group then articulated what needs to change about that practice in order to deliver the vision outcome.

2. Map WSC Index indicators to vision themes

WSC Index indicators are mapped against the vision themes to articulate how the strategies and actions can progress both the vision themes and the WSC Index indicators. While both the vision and WSC Index are useful frameworks, the WSC Index is more useful when measuring short-to-medium term progress, and the vision is more useful in generating commitment and buy-in.

3. Collect evidence for Transition Dynamics Framework analysis

Evidence for the Transition Dynamics Framework was collected in workshop discussions. These involved both the WSC Index benchmarking discussions, along with more targeted discussions that focused on identifying the enabling factors that were present (e.g. for Vision Theme 1, the group first discussed what champions were present for that practice change. Then the group discussed the platforms for connecting that were present, etc.)

4. Conduct Transition Dynamics Framework assessment

The TDF assessment was conducted by the CRCWSC team. A matrix was applied to each vision theme, and the team undertook the traffic light assessment for each of the enabling factor columns. The specific evidence from the workshop discussions was used for this analysis.

5. Determine priority strategies and actions based on Transition Dynamics Framework Assessment

The CRCWSC team then identified priority strategies for each vision theme that would address the missing enabling conditions (i.e. the yellow boxes) that if established, would further the practice change. Strategies are formulated based on what needs to happen to establish the missing enabling condition, and what makes most sense for the local context. While strategies are developed specific for individual places, the CRCWSC has started to create a database of strategy types that are used to address specific enabling factors.

This appendix walks through the analysis for each vision theme.



Image: Francis Keogh – Berowra Waters Dawn

Vision theme 1: Hornsby's natural environments are healthy and thriving with biodiversity

1. Articulate the issue and practice change required to achieve the vision theme

Issue: Water supply, sewerage and drainage systems do not traditionally consider environmental health and biodiversity objectives as a primary concern, and sometimes cause negative impacts.

Practice change: The characteristics, functions, conditions and values of ecosystems need to be better understood and respected, and the impacts of urbanisation and pollution will need to be managed. Achieving these outcomes will require natural assets to be integrated into the water management system so their management can be adequately planned and resourced.

2. Map WSC Index indicators to vision themes

The indicators relating to vision theme 1 are shown below, with scores for Hornsby in parentheses:

Goal 5: Improve ecological health

5.1 Healthy and biodiverse habitat (3.0)

5.4 Protecting areas of high ecological value (4.0)

3. Collect evidence for Transition Dynamics Framework analysis

The table below summarises evidence used for the TDF analysis for vision theme 1. The evidence in this table was gathered from transition workshop discussions around the presence or absence of enabling factors for vision theme 1.

Champions	Platforms	Knowledge	Projects	Tools
Beecroft Cheltenham Civic trust	NSROC	Bridging gap between technical and general knowledge (connection to issues and knowledge translation – need to do better)	Monitoring of biodiversity loss and gain through development applications/changes	DCP/LEP review
Tree nursery community volunteers	Social media (council Facebook page)			Aus/NZ guidelines (water quality)
Byles Creek Alliance	Community workshops		25,000 trees	Planning instruments (S88B)
Commercial industries (oyster)	Face-to-face talking to groups	Pressure (high understanding), state (not as high understanding), response (low understanding), knowledge of ecosystem	CRR program	POE act
Hornsby Conservation Society	Bushcare groups		Ecohealth program (landcare group)	CRR
STEP	Guided bushwalks (catchment tours)		Data gathering/ monitoring at state level (what data, and is this used/made accessible to council?)	Biobanking and green offset policy (OEH)
Natural recreation clubs (Berowra Runners)	CRC	Links with universities/scientific associations	OEH	Guidelines for development adjoining national parks
Councillors	UTS (university projects)		Save our species program	Coastal management program (state level)
Climate Alliance	Schools (senior geography projects)	High ecological values mapping, known	Community nursery (only a few people use it)	EPA licensing
Mayor and GM	Stormwater NSW	Mapped vegetation communities		Catchment models/ monitoring programs
Climate Change	Relationships with state government	Monitoring programs	Bushcare program	Compliance (and lack of)
Action Group (Hornsby)	Conferences/internal workshops	<i>Absence:</i>	Clean4Shore	Water quality probe tool
3 Landcare groups (Streamwatch)	<i>Absence:</i>	High risk/ consequence, low likelihood events (not much knowledge) e.g. tornados	Estuary programs coordinated across councils	Plans of management (quality objective)
Council facilitated committees (BMAC and CRR)	Stormwater forums/ discussion forums		Land acquisition strategy	Interpretive signage
Berowra Waters Progress Association	Other professional discussion forums	Cause-effect knowledge (gap) – limited resourcing? Prevents depth	reserve management	Too much leeway in planning controls
Natural Resources group within council			<i>Absence:</i>	Biodiversity strategy (draft)
Individuals within Sydney Water and OEH		Some types of fauna (gaps) e.g. amphibians	Good education programs	
Weed groups (Sydney North Weed Group)				
<i>Absence:</i>				
Age demographic (mums and dads, teens) and multicultural				

4. Conduct Transition Dynamics Framework Assessment

The following matrix outlines the TDF analysis for vision theme 1 based on the scores from the WSC Index indicators along with the collated evidence from workshops with internal and external participants (table above). Green boxes indicate the enabling factor is fully present; yellow boxes indicate some presence of the enabling factor, however they are vulnerable to regressing to the previous phase; red boxes indicate a complete absence of the enabling factor and that progression is unlikely; and grey boxes indicate the enabling factor is not yet relevant due to absence of preceding enabling factor.

Enabling Factors					
Transition phase	Champions	Platforms for connecting	Knowledge	Projects and applications	Tools and instruments
1. Issue Emergence	Issue activists	N/A	Issue highlighted	Issue examined	N/A
2. Issue Definition	Individual champions	Sharing concerns and ideas	Causes and impacts examined	Solutions explored	N/A
3. Shared Understanding & Issue Agreement	Connected champions	Developing a collective voice	Solutions developed	Solutions experimented with	Preliminary practical guidance
4. Knowledge Dissemination	Aligned and influential champions	Building broad support	S 1.1 Solutions advanced	S 1.1 Significant solution demonstrations	Refined guidance and early policy
5. Policy & Practice Diffusion	S 1. Government agency champions (OEH)	S 1.3 Expanding the community of practice	Capacity building	Widespread implementation and learning	S 1.2 S 1.3 Early regulation and targets
6. Embedding New Practice	Multi-stakeholder networks	Guiding consistent application	Monitoring and evaluation	Standardisation and refinement	Comprehensive policy and regulation

The WSC Index indicators (red box below) that are relevant to this vision theme can then be mapped to the transition phase identified in the TDF analysis.



5. Determine priority strategies and actions based on the TDF analysis

Based on the above analysis, the following strategies and actions are recommended to advance more water sensitive practice. The strategies (blue arrows in matrix) were determined based on what would influence the yellow enabling factors (above) and what is a high priority for Council.

Strategy	Actions	Outcome
1.1 Consolidate and update biodiversity and ecological health data to form a comprehensive snapshot of current challenges and opportunities	1.1.1 Develop an online mapping tool and submission form to collect data on local environmental values and conditions 1.1.2. Create an integrated database of local, state and federal environmental and biodiversity data 1.1.3. Develop a program to assess condition of natural areas and gather baseline data 1.1.4. Encourage knowledge-sharing between Hornsby, Ku-ring-gai, and other councils with best practice environmental practices	A comprehensive understanding to inform context-specific solutions and responses
1.2 Develop and strengthen compliance measures at the local levels and seek to influence positive changes in state compliance measures	1.2.1. Review compliance procedures and improve internal capacity to take a stricter and more consistent approach 1.2.2. Review preventative measures through planning controls 1.2.3. Lobby State Government for stronger biodiversity protection laws through coalition with other councils, industry and community groups	Better compliance amongst residents and industry
1.3 Build understanding among industry (specifically developers) and residents about the importance of ecological and waterways health and incentivise compliance	1.3.1. Develop and implement proactive education programs targeting private landholders about the importance of their local waterway assets, how to protect them and what the compliance measures are	Better compliance amongst residents and industry



Vision theme 2: Hornsby and its villages are full of beautiful blue and green spaces that connect people to their surrounding environment and local community

1. Articulate issue and practice change required to achieve the vision theme

Issue: The conventional approach to city planning and design typically considers water systems and the built form separately, which leads to liveability outcomes (such as aesthetic, green, cool urban environments) not being optimised.

Practice change: Water system planning and urban planning will need to be more integrated and collaborative so that standards and service outcomes that link to a broader vision of urban liveability can be achieved.

2. Map WSC Index indicators to vision themes

WSC Index indicators are mapped against the vision themes. The indicators relating to vision theme 2 are shown below, with scores for Hornsby in parentheses:

Goal 6: Ensure quality urban space

6.1 Activating connected urban green and blue space (3.5)

6.2 Urban elements functioning as part of the urban water system (2.5)

6.3 Vegetation coverage (4.0)

Goal 3: Achieve equity of essential services

3.4 Equitable and affordable access to amenity values of water-related assets (3.5)

3. Collect evidence for Transition Dynamics Framework analysis

The table below documents the evidence used to inform the TDF analysis for vision theme 2. The evidence in this table was gathered from transition workshop discussions around the presence or absence of enabling factors for vision theme 2.

Champions	Platforms	Knowledge	Projects	Tools
Natural Resources team working with engineering team	BWPA Civic trust	External conferences (SIA)	25,000 trees CRR	New environmental strategies being prepared
Current elected council (changes with one council to the next)	NSROC (sports grounds) – knowledge sharing, joint strategies, guidelines	Studies for current development of strategies: walking, cycling, heat, climate change etc.	Stormwater harvesting in parks and ovals Warata – 20 years wait for green area	State Government policies BASIX
Internal resources keeping track of innovation in WSUD	GMAC DPIE - funding case studies?	Consultants bring knowledge, challenge current practice, councillors may listen to them	Town centre revitalisation – need funding	WSUD policy in DCPs (out of date)
Recent loss of team member w/ significant role in research	Internal – project based meetings		Projects not done according to best outcomes for a place, done by rulebook (e.g. traffic rules)	Guidelines prepared for town centres – no outcomes yet
Community groups	Delivery program outlines council's projects/funding/priorities			Public domain guidelines exist (no implementation)
Community – water play, recreation				Hornsby Town Centre plan exists
<i>Absence:</i>			<i>Absence:</i>	
No one championing green walls/roofs			Demonstrations of green infrastructure (green walls/roofs) in urban areas because no champion, not on agenda, no budget in projects and no driving need	

4. Conduct Transition Dynamics Framework Assessment

The following matrix outlines the TDF analysis for vision theme 2 based on the scores from the WSC Index indicators along with the collated evidence from workshops with internal and external participants. Green boxes indicate the enabling factor is fully present; yellow

boxes indicate some presence of the enabling factor, however they are vulnerable to regressing to the previous phase; red boxes indicate a complete absence of the enabling factor and that progression is unlikely; and grey boxes indicate the enabling factor is not yet relevant due to absence of preceding enabling factor.

Transition phase	Champions	Platforms for connecting	Knowledge	Projects and applications	Tools and instruments
1. Issue Emergence	Issue activists	N/A	Issue highlighted	Issue examined	N/A
2. Issue Definition	Individual champions	Sharing concerns and ideas	Causes and impacts examined	Solutions explored	N/A
3. Shared Understanding & Issue Agreement	Connected champions S 2.1	Developing a collective voice S 2.1	Solutions developed S 2.2	Solutions experimented with S 2.2	Preliminary practical guidance S 2.3
4. Knowledge Dissemination	Aligned and influential champions	Building broad support	Solutions advanced	Significant solution demonstrations	Refined guidance and early policy
5. Policy & Practice Diffusion	Government agency champions	Expanding the community of practice	Capacity building	Widespread implementation and learning	Early regulation and targets
6. Embedding New Practice	Multi-stakeholder networks	Guiding consistent application	Monitoring and evaluation	Standardisation and refinement	Comprehensive policy and regulation



5. Determine priority strategies and actions based on the TDF analysis

Based on the above analysis, the following strategies and actions are recommended to advance more water sensitive practice. The strategies were determined based on what would influence the yellow enabling factors (above) and what is a high priority for Council.

Strategy	Actions	Outcome
2.1 Develop and communicate a compelling narrative around the importance of a place-based and outcomes focused approach to urban design integrated blue and green spaces	2.1.1. Develop place-based plans that incorporate a strong narrative around the local environmental, historical and indigenous heritage (informed through community engagement) and highlight linkages to other valuable networks 2.1.2. Examine different mediums to communicate the place-based narrative on-the-ground 2.1.3. Promote business opportunities in relation to recreational water activities 2.1.4. Develop promotional material on the unique environmental and historical values within Hornsby 2.1.5. Develop a supporting business case to articulate the economic benefit of water sensitive outcomes (e.g. urban cooling and amenity)	Councillors and staff understand the importance of a place-based approach
2.2 Implement trials and demonstration projects that promote connectivity of green and blue spaces	2.2.1. Assess strategic routes for green and blue corridors 2.2.2. Capture and communicate lessons from demonstration projects to showcase advantages of place-based planning	Demonstration of how integrated outcomes can be delivered
2.3 Strengthen integrated outcomes through Council policy and planning	2.3.1. Ensure integration across relevant LSPS strategies 2.3.2. Review and update existing public domain guidelines and town centre plans 2.3.3. Incorporate green and blue infrastructure targets into review of Development Control Plans and Local Environmental Plans 2.3.4. Incorporate of natural asset within Council's strategic asset management system 2.3.5. Investigate the development of catchment specific environmental values and targets to inform the Development Control Plan and Local Environmental Plan	Improved implementation for integrated, place-based outcomes

Vision theme 3: Hornsby Shire has engaged, empowered and active communities who value Aboriginal and cultural connections to land and water

1. Articulate issue and practice change required to achieve the vision theme

Two separate issues exist within vision theme 3:

Issue 1: Conventional water servicing defines the role for the community as customers who pay utilities to provide water system services. This is a relatively simple transaction that does not utilise the community's potential in being active water stewards.

Practice change 1: Community engagement practices will need to be meaningful and transparent, focused on empowering people to have the interest, capability and opportunity to be active partners in achieving water sensitive outcomes. For example, community expectations for liveability can inform water servicing and management, and more decentralised solutions can be incorporated into the system to be managed by households and neighbourhoods.

Issue 2: Aboriginal water knowledge, values and ways of thinking offer significant promise in guiding community stewardship; however, it is not yet understood how to best engage with Aboriginal communities to understand and embed these values

Practice change 2: Opportunities to share cultural values and connections will be needed to ensure a full diversity of values is considered and incorporated in decision-making.

2. Map WSC Index indicators to vision themes

WSC Index indicators are mapped against the vision themes. The indicators relating to vision theme 3 are shown below, with scores for Hornsby in parentheses:

Goal 2: Increase community capital

2.1 Water literacy (2.5)

2.2 Connection with water (3.0)

2.3 Shared ownership and management of water-related assets (2.5)

2.4 Community preparedness and response to extreme events (2.5)

3. Collect evidence for Transition Dynamics Framework analysis

The table below documents the evidence used to inform the TDF analysis for vision theme 3 (both practice changes):

Champions	Platforms	Knowledge	Projects	Tools
No Indigenous officer (there was)	Website/social media/e-news – council preference, limited language translation	Low knowledge on cultural connections (particularly Aboriginal connections)	Education/info dissemination	Acknowledgement to country
Internal:			Deliberative panels	Environmental Education Strategy
Catchment education officer – tours and events, community education workshops	Water quality report cards and brochures	Limited understanding of how to engage communities effectively – council doesn't have an internal community engagement team	Surveys	Various engagement strategies (project specific)
Natural resources	Interpretive signage		Workshops	
team – Water quality monitoring and reports, online data, swimming maps	HATSIC		Cultural calendar (old)	Brochures/videos produced by (former) Aboriginal officer (grant funded)
Community development officers	Workshops – community, limited internal	Council recognises this is an issue, but doesn't have the "how to" solutions to community engagement	NAIDOC week events	
Media personnel (print and radio)	Estuary Management Committee		IAP2 training (being considered)	External database on indigenous cultural heritage matters
Political support	Bushwalk and catchment tours	How to effectively engage the villages diverse communities of HSC	A new council engagement team being considered	Cultural burns
Other depts. – Parks, Planning	Streamed council MTG's		Tours of Sydney water facilities (available but too few)	
Cultural calendar with Pittwater council (years ago)	Deliberative panels			
External	Community events			
Bushcare	Surveys/welcome packs			
Friends of groups (STEP)	External partnerships – CRC, Stormwater NSW, Coastal management program			
Conservation groups	Ku-ring-gai tribal link			
Streamwatch	Aboriginal land council			
Unis/CSIRO/CRC	National parks/lands/ other councils			
Influential residents (Dr Ian Wright at UWS)	NSROC			
National parks tour guide	Sydney Water			
HATSIC (exists, not effectively engaged)	Schools network			
Journalist Tom Richmond	AAEE (Australian Association Environmental Education)			
	Independent media channels			
	Councillors at BWPA meetings			
	CRM – customer records management (complaints system)			

4. Conduct Transition Dynamics Framework Assessment

The following matrix outlines the Transition Dynamics Framework analysis for broad community engagement (practice change 1):

Transition phase	Champions	Platforms for connecting	Knowledge	Projects and applications	Tools and instruments
1. Issue Emergence	Issue activists	N/A	Issue highlighted	Issue examined	N/A
2. Issue Definition	Individual champions	Sharing concerns and ideas	Causes and impacts examined	Solutions explored	N/A
3. Shared Understanding & Issue Agreement	Connected champions	Developing a collective voice	Solutions developed	Solutions experimented with	Preliminary practical guidance
4. Knowledge Dissemination	Aligned and influential champions	Building broad support	Solutions advanced	Significant solution demonstrations	Refined guidance and early policy
5. Policy & Practice Diffusion	Government agency champions	Expanding the community of practice	Capacity building	Widespread implementation and learning	Early regulation and targets
6. Embedding New Practice	Multi-stakeholder networks	Guiding consistent application	Monitoring and evaluation	Standardisation and refinement	Comprehensive policy and regulation



The following matrix outlines the Transition Dynamics Framework analysis for engagement with Aboriginal water knowledge and values (practice change 2):

Transition phase	Champions	Platforms for connecting	Knowledge	Projects and applications	Tools and instruments
1. Issue Emergence	Issue activists S 3.3	N/A	Issue highlighted S 3.3	Issue examined	N/A
2. Issue Definition	Individual champions	Sharing concerns and ideas	Causes and impacts examined	Solutions explored	N/A
3. Shared Understanding & Issue Agreement	Connected champions	Developing a collective voice	Solutions developed	Solutions experimented with	Preliminary practical guidance
4. Knowledge Dissemination	Aligned and influential champions	Building broad support	Solutions advanced	Significant solution demonstrations	Refined guidance and early policy
5. Policy & Practice Diffusion	Government agency champions	Expanding the community of practice	Capacity building	Widespread implementation and learning	Early regulation and targets
6. Embedding New Practice	Multi-stakeholder networks	Guiding consistent application	Monitoring and evaluation	Standardisation and refinement	Comprehensive policy and regulation



5. Determine priority strategies and actions based on the TDF analysis

Based on the above analysis, the following strategies and actions are recommended to advance more water sensitive practice. The strategies were determined based on what would influence the yellow enabling factors (above) and what is a high priority for Council.

Strategy	Actions	Outcome
3.1 Develop solutions for effectively engaging Hornsby Shire's diverse community groups	3.1.1. Influence current development of Council's engagement plan to ensure it covers water engagement needs 3.1.2. Review Hornsby Shire Council website to ensure resources are available and accessible 3.1.3. Map current community engagement initiatives and who is leading them in order to identify gaps in engagement 3.1.4. Investigate innovative engagement methods and principles through behaviour change research or engagement projects from elsewhere 3.1.5. Investigate and trial methods to build peoples' connection to water	Tailored engagement strategies that are appropriate for the range of demographics within Council
3.2 Build on existing platforms to ensure community engagement is embedded across all council activities	3.2.1. Reinstate the education project control group with a clear charter and goal of providing consistent messaging and resources to community 3.2.2. Undertake engagement professional development training internally 3.2.3. Ensure water is in the charter of the Environmental Sustainability Committee (which includes community members) 3.2.4. Develop an Environmental Sustainability Engagement Plan to support Council's broad engagement plan 3.2.5. Consolidate and evaluate lessons from existing community engagement projects to inform future projects and to encourage innovation	A strategic approach to community engagement across all Council activities
3.3 Develop new knowledge about how to effectively and meaningfully engage with Indigenous communities and why it is important to do so through better engagement with HATSIC and other indigenous groups	3.3.1. Identify who to engage within the Aboriginal communities (beyond HATSIC) to initiate the conversation around what needs to be done 3.3.2. Expand and progress existing internal commitments around Aboriginal engagement	An understanding of how to effectively engage with Indigenous communities and why it is important to do so



Vision theme 4: A strong focus on water quality supports healthy, clean rivers and creeks

1. Articulate issue and practice change required to achieve the vision theme

Issue: Water system services (particularly drainage) have traditionally not considered downstream impacts as a primary focus, often leading to poor waterway health outcomes. While the removal of pollution from wastewater treatment plant discharges has become standard practice, the treatment of diffuse pollution and management of hydraulic impacts has proven more challenging.

Practice change: The characteristics, functions, conditions and values of waterways need to be better understood and respected, and the impacts of urbanisation and pollution will need to be managed. Achieving these outcomes will require natural water assets (waterways, aquifers) to be integrated into the water management system so their management can be adequately planned and resourced.

2. Map WSC Index indicators to vision themes

WSC Index indicators are mapped against the vision themes. The indicators relating to vision theme 4 are shown below, with scores for Hornsby in parentheses:

Goal 5: Improve ecological health

5.2 Surface water quality and flows (3.5)

5.3 Groundwater quality and replenishment (3.0)

Goal 3: Achieve equity of essential services

3.3 Equitable access to flood protection (3.5)

3. Collect evidence for Transition Dynamics Framework analysis

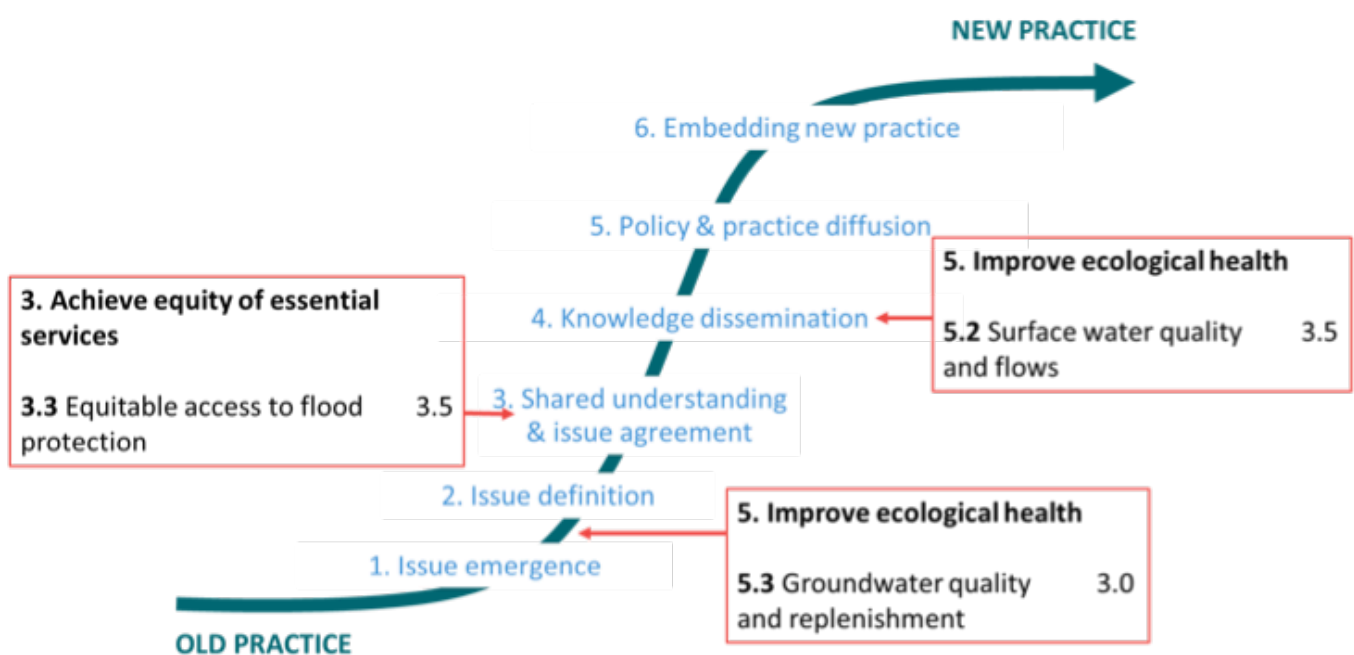
The table below documents the evidence used to inform the TDF analysis for vision theme 4:

Champions	Platforms	Knowledge	Projects	Tools
Landcare groups (Streamwatch)	River networks (informal)	Community doesn't have knowledge to value water quality – knowledge sharing gaps	Monitoring projects (ecological health, public health, environmental intelligence)	Risk-based tools, frameworks and policies
Floating landcare group	Social media			CRR
Byles Creek Alliance	Community workshops	Process studies (estuaries and creeks – lots of base knowledge)	CRR (stormwater harvesting and reuse)	Lacking Water Sensitive policy
Professional fishers/ commercial industries (oyster)	Water quality probes	Community values around waterways (data collected)	Estuary programs	Aus/NZ water quality guidelines
	Swimming maps		Research/ management of algal blooms	NWQ framework
Tourism (some operators are champions, others hinder)	Pollution compliance (face to face interaction after the fact)	Experiments (cause and effect)	<i>Absence:</i>	LEP/DCP planning instruments (e.g. to protect seagrass)
Riverside settlements	University research	Uncertain future (climate change, political will, how they impact funding)	"Smart" estuaries utilising artificial intelligence e.g. drones looking for oil spills	Community incentives (to do WSUD and septic)
BWPA	Conferences			Compliance programs
Natural resources	Internal workshops	Groundwater gap	Groundwater monitoring (only done for private industries)	TWCM strategy
Councillors (tend to be bushland focused), depends on wards (e.g. estuaries)	CRCWSC	Manuals (bioretention basins) technical/ workshops		EPA licensing – gap in compliance - ineffective
Specific staff in Sydney Water	OEH (DPIE) relationship with council	Issues (videos) other councils are facing		Natural resources regulator referral for development (potentially state level)
Dangar Island league (some issues)	GSC	Industry forums / knowledge (e.g. commercial fishers)		Offsetting tools
Prominent locals	<i>Absence:</i>	Know well – close to source, impacts of some land uses		Water quality probe (tool)
Estuary committee (residents and council)	professional discussion forums (online, interactive...)	Less known – high density development, impacts further down the system		Catchment models and monitoring programs
CRR team		Cost-benefit knowledge is limited		
		Scale (actions of individuals? Vs catchment		
		Understanding pressure-state-response		
		Process studies completed		

4. Conduct Transition Dynamics Framework Assessment

The following matrix outlines the Transition Dynamics Framework analysis for vision theme 4:

Transition phase	Champions	Platforms for connecting	Knowledge	Projects and applications	Tools and instruments
1. Issue Emergence	Issue activists	N/A	Issue highlighted	Issue examined	N/A
2. Issue Definition	Individual champions	Sharing concerns and ideas	Causes and impacts examined	Solutions explored	N/A
3. Shared Understanding & Issue Agreement	Connected champions	Developing a collective voice	Solutions developed	Solutions experimented with	Preliminary practical guidance
4. Knowledge Dissemination	Aligned and influential champions	Building broad support	Solutions advanced	Significant solution demonstrations	Refined guidance and early policy
5. Policy & Practice Diffusion	<div>S 4.1</div> Government agency champions	<div>S 4.1</div> Expanding the community of practice	<div>S 4.2</div> <div>S 4.3</div> Capacity building	<div>S 4.3</div> Widespread implementation and learning	Early regulation and targets
6. Embedding New Practice	Multi-stakeholder networks	Guiding consistent application	Monitoring and evaluation	Standardisation and refinement	Comprehensive policy and regulation <div>S 4.4</div> <div>S 4.5</div>



5. Determine priority strategies and actions based on the TDF analysis

Based on the above analysis, the following strategies and actions are recommended to advance more water sensitive practice. The strategies were determined based on what would influence the yellow enabling factors (above) and what is a high priority for Council.

Strategy	Actions	Outcome
4.1 Build on existing platforms to support knowledge-sharing with the community around how their behaviours can influence water quality	4.1.1. Understand and map existing behaviours among community and developers related to water quality 4.1.2. Identify how council staff and operations can influence behaviours 4.1.3. Develop a community engagement plan on natural resources management (incorporate into water management) 4.1.4. Develop specific education and engagement programs to address behaviours and outcomes	The broad community understands their role in improving water quality and undertakes behaviours to support this
4.2 Develop understanding of downstream cumulative impacts of different land uses (e.g. high density development)	4.2.1. Develop catchment models to assess policy settings and development scenarios 4.2.2. Articulate and refine waterway objectives and values 4.2.3. Collate monitoring data to support catchment models 4.2.4. Develop visualisations from catchment models to assist communications and decision-making	An understanding of how certain development scenarios will impact downstream environments
4.3 Learn from previous successes or failures to inform implementation of water sensitive projects	4.3.1. Audit efficiency of planning instruments to restore and protect waterways 4.3.2. Review and compile lessons learnt from existing WSUD projects 4.3.3. Build expert community of practice to share knowledge and perspectives on water management and to co-create pathways and solutions to improve practices	An understanding of how to strategically implement water sensitive city projects (including incorporating the necessary community engagement around the solutions)
4.4 Develop and strengthen compliance measures at state and local levels	4.4.1. Proactive compliance based on best evidence based compliance approaches 4.4.2. Provide information on Council's website on minimum acceptable practices by industry type	Improved compliance for waterway health outcomes
4.5 Position water management at the forefront of Council policy and planning	4.5.1. Council adopt planning policy to elevate water management in planning 4.5.2. Outcomes from catchment modelling influences planning 4.5.3. Develop council systems and processes to ensure integration of council water strategies and policies outside of LSPS process (e.g. catchment plans)	A supportive policy and planning environment for implementation of water sensitive outcomes

Vision theme 5: Sustainable resource use is supported by integrated, multi-functional infrastructure

1. Articulate the issue and practice change required to achieve the vision theme

Issue: The conventional mode of providing water system services typically delivers large-scale centralised infrastructure designed to meet singular objectives, under a set of relatively narrow assumptions about parameters such as future rainfall, population and urbanisation patterns. They also tend to prioritise cost efficiency over resource efficiency. This means opportunities to efficiently recover and reuse resources are missed, along with broader liveability and economic benefits for sectors beyond water (health, recreation and tourism).

Practice change: A more adaptive water servicing approach will be needed with greater integration of multi-functional systems across scales. Water systems will also need to be designed to take advantage of the synergies and connections between water, energy, food and land resources. The planning, design, management and maintenance of such an approach will need to be highly collaborative, with systems and processes in place to enable the sharing of risks, costs, benefits, data and lessons.

2. Map WSC Index indicators to vision themes

WSC Index indicators are mapped against the vision themes. The indicators relating to vision theme 2 are shown below, with scores for Hornsby in parentheses:

Goal 4: Improve productivity and resource efficiency

- 4.1 Benefits across other sectors because of water-related services (3.0)
- 4.2 Low GHG emissions in the water sector (2.5)
- 4.3 Low end-user potable water demand (2.0)
- 4.4 Water-related commercial and economic opportunities (2.0)
- 4.5 Maximised resource recovery (2.0)

Goal 7: Promote adaptive infrastructure

- 7.1 Diverse fit-for-purpose water supply system (2.5)
- 7.2 Multi-functional water system infrastructure (3.5)
- 7.3 Integration and intelligent control (4.0)
- 7.4 Robust infrastructure (4.0)
- 7.5 Infrastructure and ownership at multiple scales (3.5)
- 7.6 Adequate maintenance (3.0)

3. Collect evidence for Transition Dynamics Framework analysis

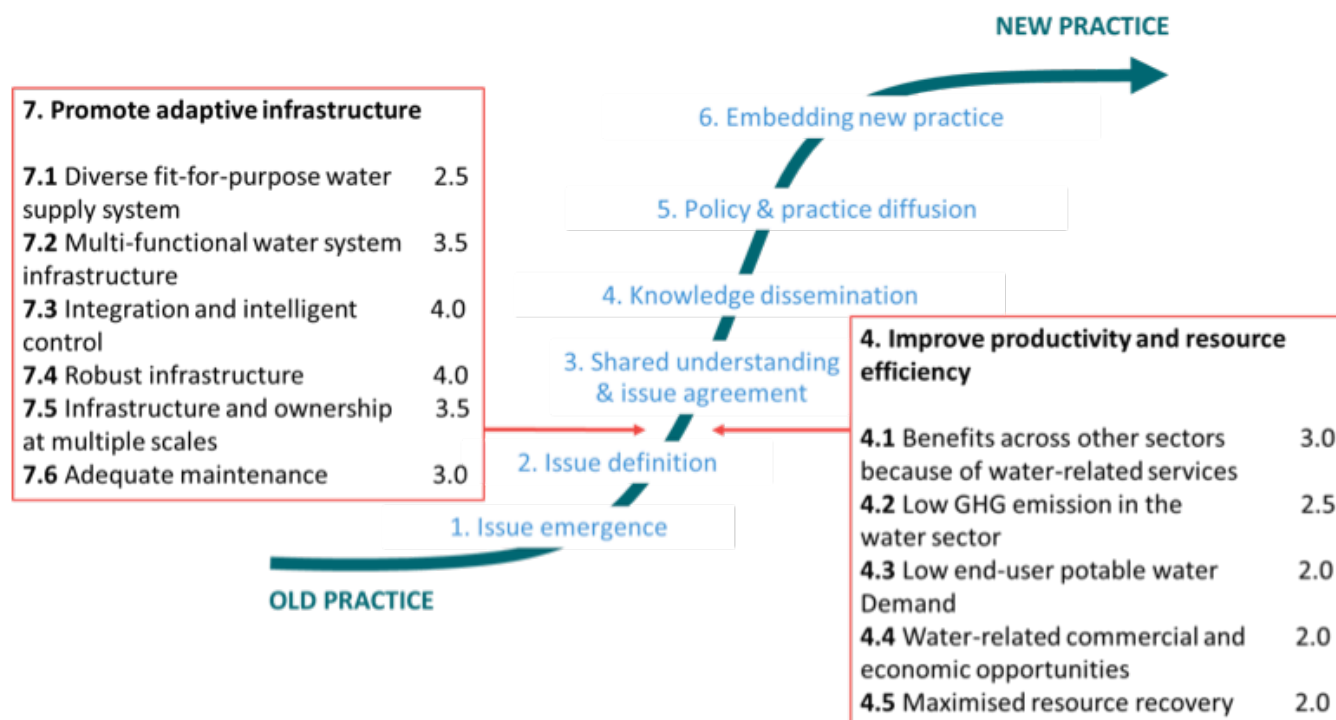
The table below documents the evidence used to inform the TDF analysis for vision theme 5:

Champions	Platforms	Knowledge	Projects	Tools
<p>Natural resources and Engineering teams are becoming better linked</p> <p>Trees – greater awareness</p> <p>Engineering involve Natural Resources when specific blue/green elements needed</p> <p>Strategy and Place team – now looking at place-based projects and more integration (6 months old)</p> <p>CRR team</p>	<p>Project level</p> <p>Project control groups for projects over \$1M</p> <p>Strategy and Place team</p> <p>CRR team</p> <p>Group that gets together internally to plan multi-functional projects – informal</p> <p>Parks and Natural Resources joined on projects (stormwater harvesting)</p> <p>Online monitoring data systems – real time, remote sensing (however not available internally or publically)</p>	<p>Stormwater harvesting – good monitoring data</p> <p>Irrigation - optimising, based on experience of when to irrigate</p> <p>Water conservation – harvesting</p> <p>Water quality monitoring and probes</p> <p>Irrigation controlled remotely, but no soil moisture sensors</p> <p>Tried to do sewer mining, too costly</p> <p>No funding for recreational opportunities</p>	<p>10 stormwater harvesting systems in place</p> <p>Hornsby quarry – potential</p> <p>25,000 trees</p> <p>Disconnect between traditional water infrastructure and water quality, funding separate</p> <p>Projects not done according to best outcomes for a place, done by rulebook (e.g. traffic rules)</p> <p>Pennet Hills golf course – greywater use</p> <p>Failed project in the Hills Estate – WSUD taken out</p>	<p>Stormwater harvesting - online remote sensed monitoring of storages/use</p> <p>Asset management systems</p> <p>WSUD policy</p>

4. Conduct Transition Dynamics Framework Assessment

The following matrix outlines the Transition Dynamics Framework analysis for vision theme 5:

Transition phase	Champions	Platforms for connecting	Knowledge	Projects and applications	Tools and instruments
1. Issue Emergence	Issue activists	N/A	Issue highlighted	Issue examined	N/A
2. Issue Definition	Individual champions	Sharing concerns and ideas	Causes and impacts examined	Solutions explored	N/A
3. Shared Understanding & Issue Agreement	Connected champions	Developing a collective voice	Solutions developed	Solutions experimented with	Preliminary practical guidance
4. Knowledge Dissemination	Aligned and influential champions	Building broad support	Solutions advanced	Significant solution demonstrations	Refined guidance and early policy
5. Policy & Practice Diffusion	Government agency champions	Expanding the community of practice	Capacity building	Widespread implementation and learning	Early regulation and targets
6. Embedding New Practice	Multi-stakeholder networks	Guiding consistent application	Monitoring and evaluation	Standardisation and refinement	Comprehensive policy and regulation



5. Determine priority strategies and actions based on the TDF analysis

Based on the above analysis, the following strategies and actions are recommended to advance more water sensitive practice. The strategies were determined based on what would influence the yellow enabling factors (above) and what is a high priority for Council.

Strategy	Actions	Outcome
5.1 Establish a forum for exploring how a place-based approach can deliver broad outcomes (e.g. the Local Strategic Planning Statement development process)	5.1.1. Identify appropriate platforms to implement a place-based approach 5.1.2. Utilise new tools to quantify multiple benefits and develop business cases for water sensitive solutions 5.1.3. Advocate for a review of BASIX to include broader planning issues 5.1.4. Develop precinct plans to deliver multifunctional water infrastructure to highest design standard 5.1.5. Develop incentives for integrated outcomes	Understanding of why a place-based approach is important for ensuring broad outcomes
5.2 Explore opportunities to demonstrate how existing and new stormwater harvesting projects can deliver broad benefits by engaging with community values	5.2.1. Explore ideas for how Hornsby Town Centre and other priority planning areas can demonstrate water sensitive city outcomes through a design charrette or similar co-design process 5.2.2. Identify opportunities through council works projects at the street, park and sub-catchment scale	Demonstration of how water quality projects can contribute to broad water sensitive outcomes

Vision theme 6: Integrated and inclusive governance arrangements delivers a holistic approach to water management while meeting the challenges of growth

Issue: Typical urban water governance structures and processes for conventional water systems include large centralised institutions with responsibilities for policy, planning, delivery and regulation of single-objective water system services. In the face of climate change and urbanisation, the community's expectations for outcomes delivered by the water system are evolving further, and now reflect a broader agenda for water to support a city's liveability and resilience.

Practice change: Governance structures, processes and capacities will need to enable and drive integrated, long-term, cross-sector and inclusive planning and design decisions in order to deliver water sensitive outcomes for the community.

2. Map WSC Index indicators to vision themes

WSC Index indicators are mapped against the vision

themes. The indicators relating to vision theme 4 are shown below, with scores for Hornsby in parentheses:

Goal 1: Ensure good water sensitive governance

- 1.1 Knowledge, skills and organisational capacity (2.0)
- 1.2 Water is key element in city planning and design (3.0)
- 1.3 Cross-sector institutional arrangements and processes (3.0)
- 1.4 Public engagement, participation and transparency (2.5)
- 1.5 Leadership, long-term vision and commitment (3.0)
- 1.6 Water resourcing and funding to deliver broad societal value (3.0)
- 1.7 Equitable representation of perspectives (1.5)

3. Collect evidence for Transition Dynamics Framework analysis

The table below documents the evidence used to inform the TDF analysis for vision theme 6:

Champions	Platforms	Knowledge	Projects	Tools
Council GMs	SOJI's various community committees	Recognise need for integrated governance	LSPS (GSC driven, happening now)	BASIX
Executive committee		Project control groups	WS Hornsby project	District plans (GSC)
Project control groups	Legal/regulatory requirement (limited)	Industry associations (Stormwater NSW, CRC RAP) – info on better governance	Every Drop Counts (water conservation) partnership (State Government and LGAs – drought response)	Council's DCP
Design Excellence Group	Project control groups	Courses on better governance	Committees: estuary, CRR – includes external reps (e.g. Sydney water)	LSPS – strategies
Natural Resources team	Conferences	Position descriptions and KPIs to drive integrated governance – outcome driven (not happening, potential solution)	OEI risk-based framework implementation	Council's project management policy (resulted in project control groups)
Councillors	Project management plan and project control groups		25,000 trees program	Eastern Sydney Regional Masterplan (Sydney Water)
Community champions – CRR committee, estuary committee, progress societies	Co-locating work teams		Requires multiple departments to implement	Hawkesbury Nepean nutrient modelling project (Sydney Water)
CRC				Licensing /offsets framework (EPA)
Splash				SOJI
GSC				
Sydney Water				
OEI (DPIE)				
Stormwater NSW				

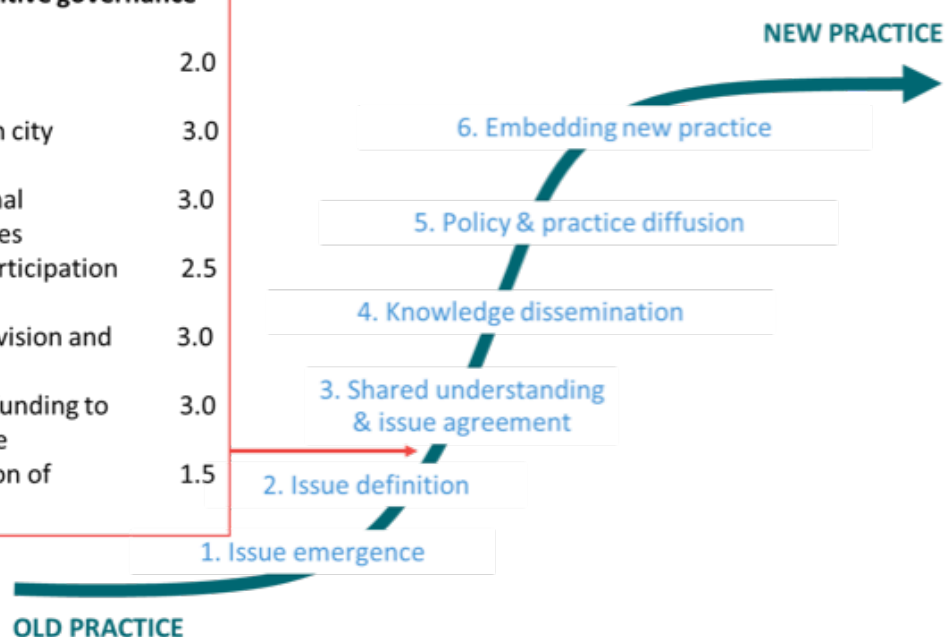
4. Conduct Transition Dynamics Framework Assessment

The following matrix outlines the Transition Dynamics Framework analysis for vision theme 5:

Transition phase	Champions	Platforms for connecting	Knowledge	Projects and applications	Tools and instruments
1. Issue Emergence	Issue activists	N/A	Issue highlighted	Issue examined	N/A
2. Issue Definition	Individual champions	Sharing concerns and ideas	Causes and impacts examined	Solutions explored	N/A
3. Shared Understanding & Issue Agreement	Connected champions	Developing a collective voice	Solutions developed	Solutions experimented with	Preliminary practical guidance
4. Knowledge Dissemination	Aligned and influential champions	Building broad support	Solutions advanced	Significant solution demonstrations	Refined guidance and early policy
5. Policy & Practice Diffusion	Government agency champions (GSC)	Expanding the community of practice	Capacity building	Widespread implementation and learning	Early regulation and targets
6. Embedding New Practice	Multi-stakeholder networks	Guiding consistent application	Monitoring and evaluation	Standardisation and refinement	Comprehensive policy and regulation

1. Ensure good water sensitive governance

- | | |
|--|-----|
| 1.1 Knowledge, skills and organisational capacity | 2.0 |
| 1.2 Water is key element in city planning and design | 3.0 |
| 1.3 Cross-sector institutional arrangements and processes | 3.0 |
| 1.4 Public engagement, participation and transparency | 2.5 |
| 1.5 Leadership, long-term vision and commitment | 3.0 |
| 1.6 Water resourcing and funding to deliver broad societal value | 3.0 |
| 1.7 Equitable representation of perspectives | 1.5 |

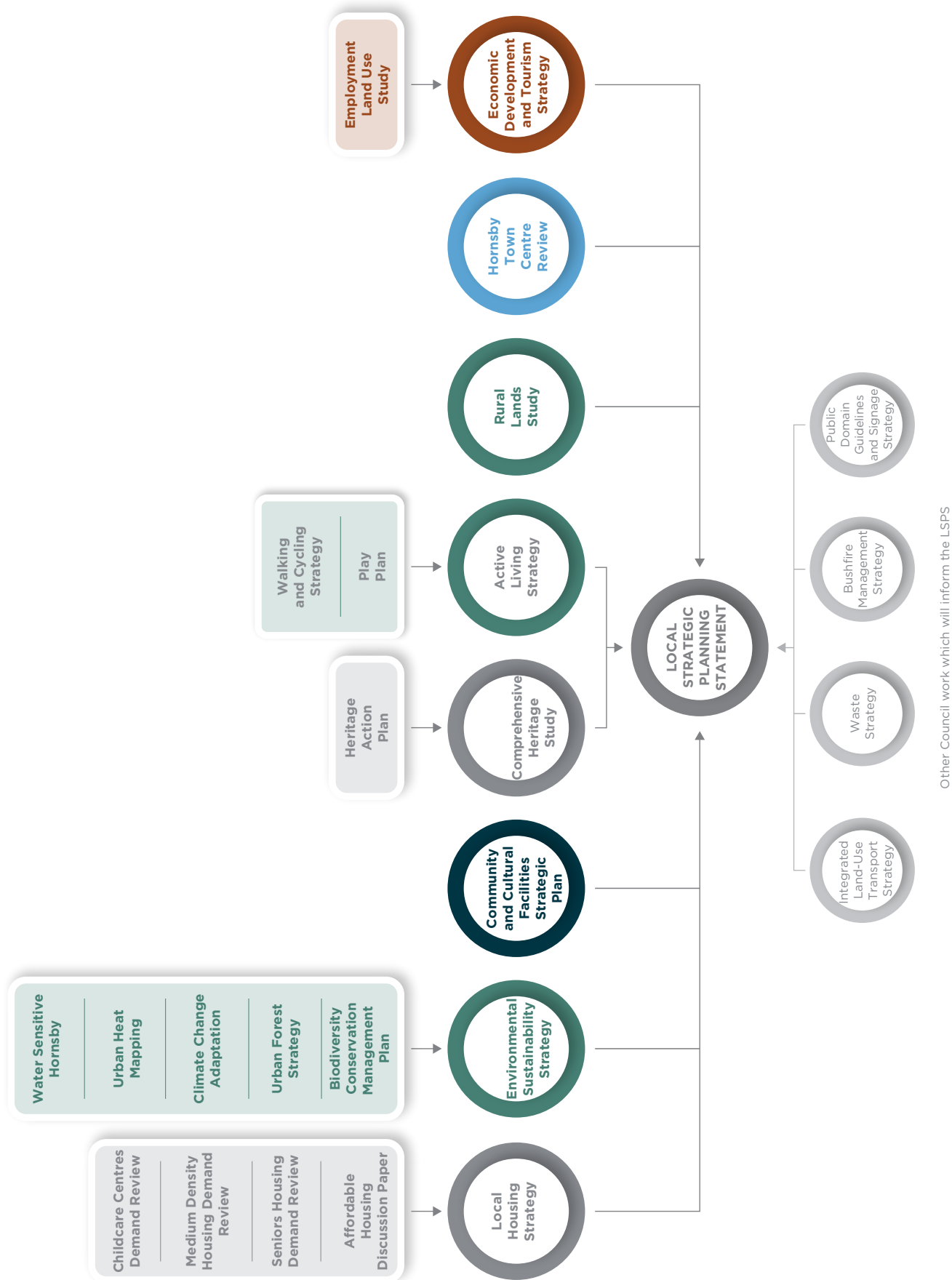


5. Determine priority strategies and actions based on the TDF analysis

Based on the above analysis, the following strategies and actions are recommended to advance more water sensitive practice. The strategies were determined based on what would influence the yellow enabling factors (above) and what is a high priority for Council.

Strategy	Actions	Outcome
6.1 Investigate and explore options to implement collaborative governance (both formal and informal) beyond project-specific activities	<p>6.1.1. Hold internal capacity-building activities to build breadth of knowledge within Council staff</p> <p>6.1.2. Review development approvals process to determine why some elements are ineffective</p> <p>6.1.3. Evaluate the effectiveness of existing collaborative governance solutions and approaches to inform future solutions</p> <p>6.1.4. Deliver water sensitive city messaging to senior and executive staff</p> <p>6.1.5. Ensure water is at the forefront of decision-making by making it agenda item in project control groups</p> <p>6.1.6. Establish an informal regional water sensitive cities group that utilises online tools and forums to share knowledge and ideas</p>	The mechanisms and processes exist to support collaboration beyond individual projects
6.2 Build on existing platforms for collaboration to be beyond projects	6.2.1. Develop theme-based control groups (e.g. water or environmental sustainability) that include officer and senior level staff	The project control group model is elevated to the program level to ensure consistency and longevity

Appendix C – Council strategies



Appendix D – Community ideas for action

1. Improving water quality and flows

No.	Ideas	Supporting detail
1.1	Implement green infrastructure along transport corridors (major roads, minor roads, railway line) to improve water quality and reduce flooding impacts	<ul style="list-style-type: none"> ■ Peats Ferry Road and cycleway ■ E.g. raingardens, swales ■ Use railway tracks and verges for water treatment
1.2	Encourage stakeholders to invest in rain gardens on private land (see action 2.4)	
1.3	Review process for monitoring and maintaining on-site sewage management systems	
1.4	Implement oil and litter traps for stormwater	
1.5	Monitor, report on and publicise polluted stormwater discharge to waterways	<ul style="list-style-type: none"> ■ To identify pollution sources and hold people accountable
1.6	Identify new opportunities to recycle stormwater for irrigation	<ul style="list-style-type: none"> ■ Parks and sports fields
1.7	Recycle wastewater treatment plant discharge for irrigation	
1.8	Provide financial incentives (e.g. rebates, subsidies) to implement water sensitive urban design solutions on private property	<ul style="list-style-type: none"> ■ E.g. rainwater tanks, rain gardens, and other water sensitive urban design features

2. Informing and educating citizens

No.	Ideas	Supporting detail
2.1	Develop education programs for different parts of the community that outline what actions they can take to conserve water in the home and live more sustainably	<ul style="list-style-type: none"> ■ Actions for people in high rises will be different to actions for people with land ■ People should consider what they put into their drains (e.g. household products, car washing)
2.2	Promote Council water sensitive urban design projects with signage, posters and other methods of information sharing	<ul style="list-style-type: none"> ■ So the community understands and appreciates the benefits of water sensitive urban design
2.3	Re-implement stencilling program on stormwater drains so the community understands where stormwater goes and their impact on downstream waterways	<ul style="list-style-type: none"> ■ Engage community groups to do the stencilling
2.4	Develop guidance and provide materials for people who want to build rain gardens on their property	<ul style="list-style-type: none"> ■ “Build your own rain garden” kits ■ Native plant giveaways
2.5	Develop a community award or other recognition for community contributions	<ul style="list-style-type: none"> ■ Recognise people who build rain gardens or rainwater tanks

3. Connecting people and place

No.	Ideas	Supporting detail
3.1	Create an urban beach so people in urban areas can enjoy amenity and recreation benefits of water	<ul style="list-style-type: none"> ■ E.g. at Brooklyn or the Hornsby Quarry
3.2	Review access to riverside areas to promote ideas for greater accessibility	<ul style="list-style-type: none"> ■ Provide shuttles or transport options for uphill journeys ■ Create more walkways with information stations
3.3	Link schools and groups (e.g. Scouts) to local environmental projects	<ul style="list-style-type: none"> ■ E.g. local Habitat for Humanity projects

4. Greening urban areas

No.	Ideas	Supporting detail
4.1	Incorporate plants and green infrastructure into traffic islands and roundabouts	
4.2	Encourage and incentivise rooftop gardens and green walls on high-rise buildings	<ul style="list-style-type: none"> ■ E.g. learn from Central Park in Sydney
4.3	Encourage residents to implement balcony and verge gardens	<ul style="list-style-type: none"> ■ Best balcony/verge garden" competitions ■ Promote urban food production
4.4	Council buildings lead by example with green walls and vertical gardens	
4.5	Create community gardens and urban gardens to support knowledge sharing and a sense of community	

5. Creating healthy habitats

No.	Ideas	Supporting detail
5.1	Identify areas for seagrass and mangrove planting to improve river habitats	
5.2	Identify areas of salt marsh for protection	
5.3	Encourage a diverse range of people to get involved in bushcare groups	<ul style="list-style-type: none"> ■ Especially youth and people in high rises
5.4	Encourage bush regeneration groups to eliminate invasive weeds	<ul style="list-style-type: none"> ■ E.g. Lantana, Privet
5.5	Promote knowledge of native bush species so weeds can be identified	
5.6	Continue anti-litter campaigns	<ul style="list-style-type: none"> ■ E.g. Clean Up Australia, KESAB
5.7	Encourage rehabilitation of eroded riverbanks	

