



CRC for
Water Sensitive Cities



Linking greenspace frameworks to delivery of water sensitive cities

Project B1.2 Catchment-scale landscape planning for water sensitive city-regions in an age of climate change

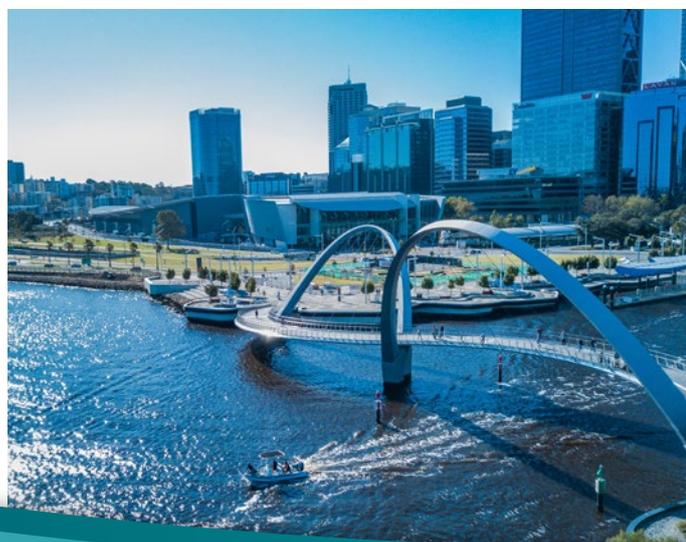
Overview

Legacies from past land use and water infrastructure planning decisions have greatly altered hydrological functions of urban areas. In some areas, this has reduced areas of green open space to small fragments that are geographically disconnected from each other. Planning for the location and function of green spaces which considers water resource context can improve protection and enhancement of ecosystem services and other ecological and social benefits, including those that assist with flood management.

This project sought to improve the understanding of how urban and regional planning supports green open space planning for improved water resources management, with a particular focus on flooding and related ecosystem services.

Project design

The project applied a case study approach which examined green space policy and planning tools in highly urbanised systems, seeking those that demonstrated a greater understanding of the dependence and impact on water resources at the metropolitan-region scale. Three case study areas were selected as the subjects: south east Queensland (SEQ), Melbourne and Perth.



Key findings

The analysis of regional green open space planning approaches in three Australian capital city-regions noted an acknowledgement of the relationship between flood regulation and green open space planning in various associated planning mechanisms. However, there is limited explicit integration of flood management and green open spaces planning. There are also significant on-ground barriers to enabling this integration given the legacy of past planning decisions and a lack of information to support implementation.

For example, Queensland's policy framework recommends integrating public green open space with drainage corridors, restoring connectivity between rivers and floodplain, and understanding water cycle needs and flooding vulnerabilities of rural communities. However, SEQ's green space strategy makes little reference to the benefits of planning for connected strategically placed green open spaces to manage flood risk. References are made, however, to the role of green open spaces in mitigating the effects of climate change and flooding along with the state planning policy and a guide to the region's ecosystem services framework.

Some progress has been made in Melbourne, which has seen a paradigm shift in the management of overland flow and flood management, away from hard engineering solutions such as levee systems, towards allowing the environment to convey and store floodwater at appropriate times using flood planes, wetlands and other green open spaces such as parks and golf courses. Melbourne documents mention potential contributions of stormwater harvesting in open space areas to flood risk management, and the contributions of green infrastructure to flood management alongside other amenity and resource management benefits. Recognition of these benefits notwithstanding, there are limited references to actions and implementation mechanisms conducive to supporting planning for green open space for flood regulation and ecosystem services.



In Perth, the benefits of green open space for flood regulation are also recognised in policy and planning guidance. These recognised benefits include establishing green open spaces that can be used for urban stormwater management; retaining and enhancing waterways; providing scope for urban flood retention and runoff detention features in green open space areas with relatively low sensitivity to flooding; and considering permanent water bodies as features in urban areas that contribute to water management functions.

In Perth, a key urban water management process document provides guidance on implementing the regional water strategy and on integrating key water policy with land use planning for greenfield developments and urban renewal. The process outlines how water resources can be considered, investigated and addressed at each planning stage. Although this guidance relates to regional as well as local scale planning activities, anecdotal evidence suggests that the requirements are not consistently applied across land use and water resources management planning.

Adapting greenspace frameworks

Looking at connections between green open spaces, waterways and stormwater has accompanied the emergence of goals to increase the volume of stormwater retained in the landscape (particularly in upper catchment areas) and flowing through green spaces before entering drainage/waterways. Achieving this may not only benefit flood management, but also water demand management, ecological health of waterways, and urban amenity.

Current research strongly indicates there is a need for improved integration between land use planning (including green open space planning) and water resource management. Key opportunities for improved open space frameworks include:

- placing green open spaces in accordance with the natural hydrogeographic layout to capture and infiltrate urban runoff in proximity to natural stream or wetland systems. This approach can alleviate pressures on underground drainage networks and reduce risks of sewer and stormwater flooding.
- avoiding development of urban settlements in floodplains, leaving them as green open spaces with designated land uses (such as agriculture and recreational areas) that may be temporarily suspended during flood periods with acceptable losses
- placing green open spaces alongside, or close to urban streams, with multi-functional attributes providing active transport corridors, recreational areas, amenity, and habitat
- protecting urban riparian vegetation and wetlands to maximise water infiltration and reduce the velocity of stormwater to minimise flood damage to private and public infrastructure as well as retention of pollutants entering waterways
- identifying and protecting wetlands and their buffers and hydrological regimes early in development and planning processes and using flood storage potential
- planning for interconnected and strategically planned networks of green open spaces early in land use planning and design processes, with consideration of ecosystem values and water-related landscape functions.

The impact of decisions (and associated infrastructure and urban development) on regional waterways carried out at the local scale needs to be thoroughly assessed to avoid cascading effects throughout the whole catchment. A universal greenspace framework that can be used in future planning processes would also need to manage and adapt legacy planning and integrate whole-of-catchment strategies.

References and resources

Renouf, M.A., Kenway, S.J., Serrao-Neumann, S., Low Choy, D., 2016, Urban metabolism for planning water sensitive cities: Concept for an urban water metabolism evaluation framework. Melbourne, Australia: Cooperative Research Centre for Water Sensitive Cities.

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