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Best Practice: Water Sensitive Urban Design

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CITY: MELBOURNE **POLICY AREAS: CITY PLANNING; CLIMATE CHANGE**

BEST PRACTICE

The City of Melbourne launched the "Total Watermark: City as a Catchment" Strategy in 2008 to move from a traditional approach to water management toward becoming a truly sustainable"water sensitive city" through water savings, alternative water use, stormwater quality, wastewater reduction and groundwater quality targets.

ISSUE

Melbourne experienced a prolonged drought from 1996 to 2009. Future rainfall projections for Melbourne indicate that rainfall will continue to decrease with likely reductions of 10% by 2030 and up to 25% by 2070. Given these drought conditions, as well as climate change and population growth, it is necessary for urban communities to incorporate design strategies for water management that prove resilient.

Further, Melbourne's water supply and water management is under constant pressure. There is a need to use existing supplies wisely in order to avoid drawing further supplies from waterways and/or causing ecological damage through the construction of dams and other infrastructure.

GOALS AND OBJECTIVES

The objective of the strategy is to create a water sensitive city. This approach recognizes the important role of the natural catchment but focuses primarily on artificial city catchment solutions (including features located on roads, roofs and impermeable surfaces) to minimize water consumption, reduce wastewater generation and lessen the impact of stormwater discharges on receiving waters.

The approach seeks local solutions to achieve sustainable water management, including the adoption of demand-management practices and harvesting alternative water supplies. These solutions aim to reduce the reliance on one centralized water supply source – potable water. They also aim to minimize environmental and social impacts.

IMPLEMENTATION

The City of Melbourne is located at the bottom of the Port Phillip Bay catchment and is home to three important waterways: the Yarra River, Maribyrnong River and Moonee Ponds Creek. They all provide important habitat, aesthetic, recreational, tourism and economic value to local industry and the broader community. The area of land within the municipality is 3,766 hectares.

Identifying the movement of water through the municipality made it possible to better implement sustainable urban water management. The Council was able to act immediately on the land and buildings it owns and this had a profound influence over practices in the private domain (commercial and residential) through education, policy reform and enforcement.

Under the City as a Catchment approach, a stormwater pollution budget was developed by assessing the type of surface that rainwater is likely to fall on, and calculating the pollutants that the stormwater would pick up as a result of different land-use practices. Calculating the amount of rain falling on roads, footpaths, open space, roofs or other impervious areas, allowed for estimation of the amount of total suspended solids (e.g. soil, tire and car residue), total phosphorus (detergent and fertilizers) and total nitrogen (air-borne pollutants and fertilizers) that needed to be managed in the municipality.

The City as a Catchment strategy includes the following initiatives:

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- Implementing Water Sensitive Urban Design (WSUD) including wetlands, rain gardens, storage tanks and permeable surfaces
- Assisting other metropolitan municipalities to apply the City as a Catchment approach
- Introducing changes to road maintenance, building and construction practices for conserving water, water harvesting, improving water quality, and improving the health of waterways
- Assisting large non-Council sites to implement WSUD, such as the Shrine of Remembrance, Public Record Office, Flemington Racecourse and the MCG sports grounds.
- Undertaking a climate adaptation analysis and works to feed into storm water harvesting and microclimates
- Rolling out a sustainable building program with the private sector to reduce energy and water use (1,200 Buildings Program)
- Supporting continued research into urban advancement towards 'water sensitive cities' using the City of Melbourne as a pilot

The following decision-making guidelines were set out to assist sustainable water management on a site-by-site basis.

1. All city sites are catchment
All city sites (buildings, roads, open space) are to be considered holistically to contribute to sustainable water management across the municipality. Over time this will build resilience to the ongoing pressures of urban consolidation and climate change on water resources and aquatic environments.

2. Community engagement
Community engagement is an integral component of all projects and needs to include information sharing and feedback from relevant stakeholders and the community about water options and potential issues.

3. Decentralized water solutions
Fundamental to achieving the City as a Catchment approach is the incorporation of local decentralized solutions. To achieve this, all city sites, planning or building proposals, and Council-managed projects need to:

a) identify a site as a water source or sink (that is, a site water budget) and identify opportunities on the site itself and on adjacent/nearby sites that could use surplus water from the site or supply a source of water if a site deficiency exists

b) account for the costs and benefits of decentralized water options in terms of water, energy, building, materials/infrastructure/technology, and risks

c) consider habitat enhancement for biodiversity, bird life and microclimate benefits.

4. Hierarchy of sustainable water solutions
A hierarchy of guiding rules was set out to promote the adoption of City as a Catchment water management practices across Council-managed assets, residential and commercial/industrial land uses. The hierarchy establishes a general approach based on least cost, least energy-intensive options in the first instance through to more complex solutions in which the water-cycle benefits need to be considered in the context of the project's effect on broader sustainability sectors (such as energy).

The City of Melbourne works with a range of stakeholders to deliver its water program. This includes, but is not limited to, the partnerships set out in the table below.

No.	Partner/s	Program	Description
1	Melbourne Water	Living Rivers Stormwater Program	Assistance and funding to deliver to WSUD project on the ground.
2	Inner Melbourne Action Plan (IMAP): Yarra, Port Phillip and	Action 9.1 Environmental Targets	Action 9.1 addresses consistency of environmental targets across the IMAP councils.

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	Stonnington councils	Action 9.3 Water Sensitive Urban Design Action 9.6 Water in Parks	Action 9.3 addresses consistent guidelines and local policies for implementing WSUD. Action 9.6 addresses water management in parks including irrigation efficiency and alternative water solutions
3	Environment Protection Authority (EPA) Victoria	Yarra River Investigations and Response Program	Assistance and funding to deliver stormwater pollution improvement projects.
4	Melbourne Water, Sustainability Victoria, EPA and Yarra, Stonnington and Boroondara councils	Lower Yarra Litter Strategy	Partnership program to deliver litter reduction projects to protect our waterways.
5	International Council for Local Environmental Initiatives (ICLEI)	ICLEI Water Campaign	To date we have achieved Milestone 4 in Community Water Use and Milestone 3 in Corporate Water Use.
6	1200 Buildings Program		Building Retrofit Program to catalyse building retrofit works for two thirds of the commercial buildings in the municipality to save water and energy.
7	Sustainable Water Use Reference Group	Council-run partnership	This reference group pursues sustainable water management projects in parks, business and across the community. Partners include City West Water, South East Water and the Plumbing Industry Commission.

COST

The City of Melbourne spends between 5 and 10 million AUD ($4.37 million USD and $8.75 million USD) annually on water sensitive urban design projects. Primarily this has been spent on irrigation upgrades, turf replacement and building water savings improvements. Approximately 2 million AUD ($2.75 million USD) has been spent annually on alternative water source and stormwater quality improvement projects.

RESULTS AND EVALUATION

The City of Melbourne has been recognized as a leader for its commitment to sustainable water management, achieving a"water sensitive city," and for its approach to applying water sensitive urban design techniques.

Based on activities to date, the City of Melbourne has achieved:
70% reduction in council water use
44.7% reduction in water use per resident
41.5% reduction in water use per employee
16% reduction in water pollution entering Melbourne's waterways

TIMELINE

"Total Watermark—City as a Catchment" was published in 2008. The strategy and its implementation will be fully reviewed in 2012 in accordance with changes in policy, design, technology, behavior and other factors. Action plans will be undertaken annually and yearly progress towards achieving the targets are reported in the City of Melbourne's annual report.

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LEGISLATION

Water Sensitive Urban Design is embedded in Council's Planning Laws.

LESSONS LEARNED

Much of the city's green open spaces, particularly the European-style gardens, rely on irrigation over the summer months for their survival. With water restrictions in place and low water storage levels, maintaining the health of the trees, parks and gardens become a difficult issue.

The City Council is overcoming this issue through a variety of actions including:

- Gradually replacing city parks and sports ground lawns with drought-tolerant grasses to increase durability for sports and events
- Using reclaimed water from Royal Park wetlands to water the Royal Park Golf course and Royal Park North sports grounds, as well as supplying water to the city's trees and selected fountains
- Placing additional mulch under trees to improve water retention over the summer months
- Installing sub-surface irrigation systems to minimize water loss through evaporation associated with sprinklers
- Restricting the use of spray sprinklers or spray watering systems except for specific exceptions as indicated in the water conservation plan
- Raising mowing heights to improve water retention

TRANSFERABILITY

As every region's topography and circumstances differ, not all solutions will be of equal value in creating a "water sensitive city." Alternative water sources are graded according to their applicability to the City of Melbourne municipality. However, the City of Melbourne would like to share its experience and hear from other cities as well.

CONTACTS

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http://www.melbourne.vic.gov.au/Environment/WhatCouncilisDoing/Pages/Watersavingsinitiatives.aspx
http://www.melbourne.vic.gov.au/Environment/WhatCouncilisDoing/Documents/city_as_catchment.pdf

Facts and figures in this report were provided by the highlighted city agency to New York City Global Partners