



TRANSITIONING TO A WATER SENSITIVE CITY

a case study report prepared for the IMAP Councils

“

the most expensive water is the
water that you don't have

”



WHAT IS A WATER SENSITIVE CITY?

Human settlement and urbanisation has historically been driven by the access to and supply of water through a natural catchment. Melbourne is a key example of this through it's reliance on the Yarra River, its catchment and tributaries as our main source of water supply.

Through urbanisation we utilise these natural processes, intercept them and modify them, utilising the natural catchment to our advantage. In our current water practices, the water cycle predominantly uses the water once before discharge, generally from a remote water source.

The concept of a 'Water Sensitive City' addresses the need to transition away from a 'Water Supply City' and develop new strategies to establish a more resilient, sustainable water system within our urban environment.

The three key attributes to a Water Sensitive City are as follows

- Cities as Catchments
- Cities Providing Ecosystem Services
- Cities Comprising Water Sensitive Communities

The key to the success of these attributes is that it must be delivered in the form of a liveable city.





WHAT ARE THE KEY PRINCIPLES?

There is no single solution to delivering a water sensitive city. Each case study must be assessed and a vision planned through all levels of implementation and development to ensure a successful outcome.

The key principles to be embodied in a strategy to transition to a water sensitive city are as follows

- Reduce (conserve)
- Reuse (without treatment)
- Replace (substitution based on fit for purpose use)
- Recycle (treatment and reuse)

One of the critical aspects to underpin the planning for a Water Sensitive City is an approach which addresses the integration of public and private systems.





BEDZED
Sustainable medium density housing.
London, UK

HOW CAN WE TRANSITION?

The process to transition should be undertaken as a strategic approach that is addressed through the following

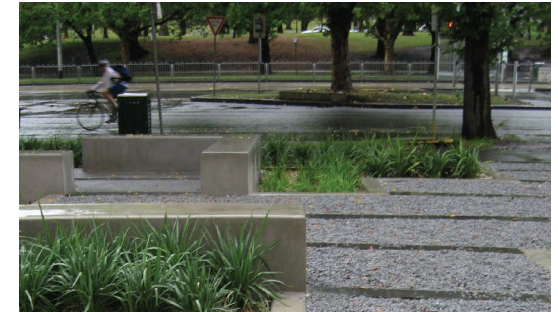
- Collaboration and partnerships
- Community engagement
- City wide and neighbourhood strategies
- Identifying opportunities through urban redevelopment and infrastructural upgrades

As a result, technologies, infrastructure and urban form would need to be:

- diverse, flexible and adaptable
- designed to reinforce sustainable practices
- linked to community needs

The Water Sensitive Cities task can appear daunting at first glance. The large centralised infrastructure projects such as the desalination plant and the north-south pipeline have “bought us time”. However the key question is “what are we going to do over the next 20 years to integrate decentralised and distributed water sources in order to deliver a more resilient and robust urban water system?”

Whilst a city cannot be transformed ‘overnight’ we must remember that a city is simply made up of numerous neighbourhoods. Urban renewal opportunities within our communities are on-going and provide us with the chance to do things differently.



“ Urban renewal opportunities . . .
provide us with the chance to do
things differently ”



*Westerpark
Reclaimed industrial zone.
Amsterdam, The Netherlands*

CASE STUDIES

The following local case studies summarise two projects in Melbourne that are being undertaken with the vision of implementing the key principles of a Water Sensitive City.

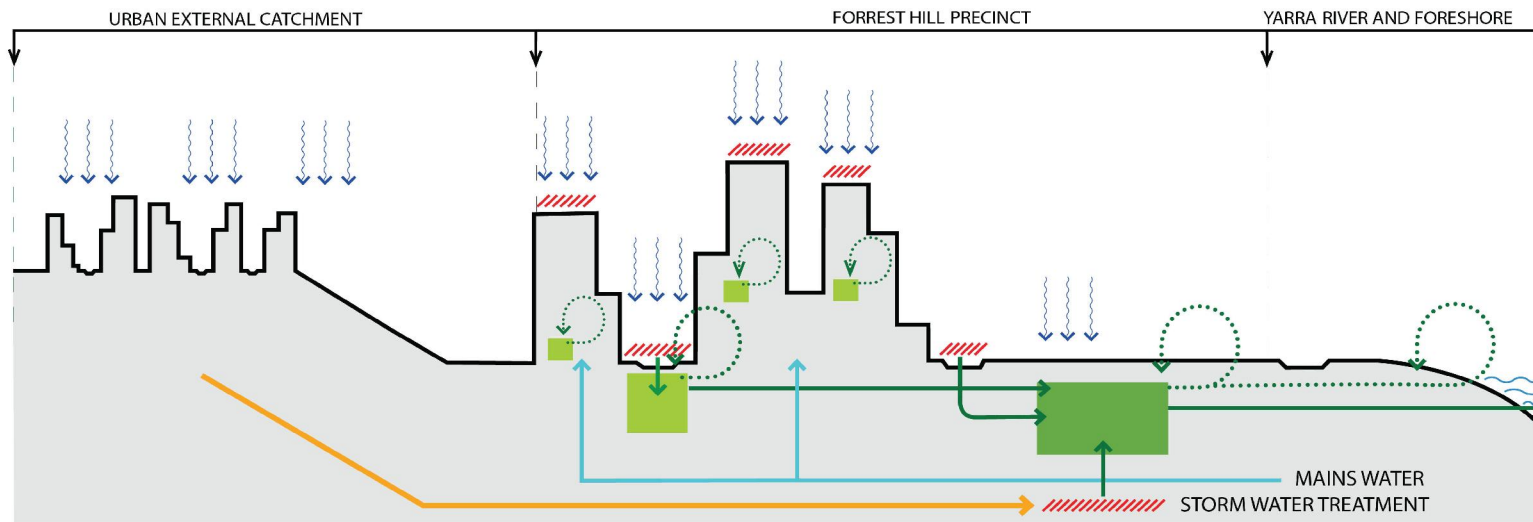
The key similarities between the two sites are that they are both taking the opportunity through urban revitalisation to implement sustainable water management practices at a neighbourhood level whilst thinking at a City wide level.

**More detailed information on each of these Case Studies can be supplied through the respective Councils.*



*WaterNet Head Offices
Green roof for mitigating stormwater runoff
Amsterdam, The Netherlands*

“...opportunity to link the community to a more sustainable urban water system”



LEGEND

- External Stormwater
- Mains Water
- Rainfall
- Stormwater Treatment - Private and Public
- Treated Water
- Treated Water Reuse
- Local Storage (treated)
- Precinct Water Storage (treated)

KEY PROCESSES

- Stormwater treatment in the private realm
- Stormwater treatment in the public realm
- Stormwater re-use for irrigation
- Stormwater reuse in public realm
- Stormwater reuse within buildings
- Treatment and storage of external Stormwater
- Reticulation of precinct storage back into the private realm

The Forrest Hill Precinct is an existing developed area of approximately 14ha within the City of Stonnington, South Yarra, Melbourne. In the coming years, the Precinct is to be redeveloped from a mix of scattered land uses to an inner city hub of primarily educational, residential, office and retail land uses. This strategic high density redevelopment provided the City of Stonnington with an opportunity to link the community to a more sustainable urban water system through the use of stormwater at a range of spatial scale.

Benchmarks were established for both the private and public realm to provide direction and targets for stormwater flow reduction, stormwater pollution reduction and potable substitution within the Precinct.

FORREST HILL STONNINGTON COUNCIL

The key recommendations that have been mapped out for the Forrest Hill precinct are as follows:

- Minimum harvesting and reuse of 85% of rainwater on private roofs within private allotments
- All runoff generated in the public and private realm to be treated in accordance with the Best Practice Environmental Management guideline objectives
- Integration of Water Sensitive Urban Design features within the public realm to enhance the liveability of the urban environment
- Integrating the proposed biodiversity corridor along the Yarra River with a stormwater harvesting system to potentially supply 80% of irrigation demands within Darling Gardens and Melbourne High School.



“ implemented at minimal cost to the community ”



The Doncaster Hill 'Smart Water Plan' was developed to support a number of Council's planning requirements and processes, including:

- Sustainable Design Taskforce - a Council led review panel for private developments within the planning phase of a project
- Sustainability Management Plan. The Sustainability Management Plan process requires developers to demonstrate how Environmentally Sustainable Design will be implemented across areas such as water and energy management, waste, and air quality for their proposed developments.

The Smart Water Plan was developed through an Integrated Water Assessment Study. Through its delivery, development from Doncaster Hill will benefit from:

- The use of Class A recycled water for appropriate internal and external uses
- Water Sensitive Urban Design principles integrated into the built form
- Up to 60% reduction of mains water use
- Water recycling

Council is undertaking its own Community Hub Civic Precinct development to compliment the Smart Water Plan. When finished, it will provide a local Environmentally Sustainable Design showcase of initiatives for developers to replicate. The Community Hub project is being developed with funding support from State and Federal Government.



DONCASTER HILL MANNINGHAM COUNCIL

The Doncaster Hill development in Manningham City Council is an example of how the Smart Water Plan can be used. It was taken as an opportunity to introduce WSC principles into an urban brownfield development. Utilising the opportunity through a key urban redevelopment ensured that this key upgrade in water servicing is implemented by considering 'least community cost' principles.

The principles of 'least community cost' address implementation savings across administrative boundaries to ensure wholistic and long term benefits rather than a focus on project by project savings.

As part of a 20 year vision, this 58Ha site will be transformed into a high density urban community. To support Council's vision, a collaboration between Council, Melbourne Water and Yarra Valley Water looked at integrated water servicing models which supported expected growth and Council's planning expectations for Environmentally Sustainable Design.

The 'Smart Water Plan' will be implemented through both localised infrastructure solutions and a co-ordinated approach to developer approvals across the different agencies. Typical of Activity Centre development, Doncaster Hill will be largely undertaken by the private sector in response to market demands.





Initiated through awareness of Climate Change and a drive for creating liveable cities, there are many international cities providing frameworks and initiatives to prepare for a more resilient and adaptable urban environment.

These strategies operate through a variety of scales and goals however the common themes of private/public partnerships, collaboration and livability through sustainability are all common themes.

The following are some leading international strategies that can be investigated further.

*Queens Botanic Gardens Visitors Centre
NYC's first Platinum LEED building
Flushing, New York*

WHAT ARE OTHER CITIES DOING?

PlaNYC

www.nyc.gov/html/planyc2030

– 1 Million Trees NYC

One of the 127 strategies under PlaNYC
A city wide public private program that has set a goal to deliver one million trees in NYC over the next decade with vision to create a more liveable city

www.milliontreesnyc.org

Chicago Climate Action Plan

Chicago's plan for the future to mitigate against climate change effects on Chicago's temperature, precipitation and ecosystems.

www.chicagoclimateaction.org

Olympic Park Legacy Company (London)

A strategy to deliver a new urban area to London following the Olympic Games focussing on the Lea River as its key asset.

www.legacycompany.co.uk/

Singapore ABC

(Active Beautiful Clean)

A strategy to maximise the potential of Singapore's waterways to support the national population. The program focuses on benefits through lifestyle, environment and people.

www.pub.gov.sg/abcwaters

Rotterdam Climate Initiative

A city wide strategy that focuses on climate change initiatives that facilitate economic growth.

www.rotterdamclimateinitiative.nl

*High Line Park
Reclaimed industrial site providing for Ecology
and Community infrastructure
New York City*





At the core of a Water Sensitive City is a community that values and understands the financial, social and environmental cost of water. To connect the community to their own water footprint you need to tap into what motivates them. Communicating through issues and impacts that they can see and identify will ensure greater success.

*Sportsplaza Mercador
Green facade treatment on Municipal facility
Amsterdam, The Netherlands*

RECOMMENDATIONS AND KEY ACTIONS

COLLABORATE, ENGAGE, DIVERSIFY

The following are core ingredients for establishing a Water Sensitive City

- Investigate the opportunities for partnerships between private, government and community enterprises to work together to achieve key goals.
- Define overriding targets, principles and opportunities.
- Define a clear role and expectation for each stakeholder, including the community.
- Undertake a water management strategy that will govern infrastructural change.
- Plan for and build capacity for multiple water sources to ensure a resilient water community.
- Treat the environment as a customer and key stakeholder when making decisions.
- Don't wait for others to initiate the change, lead by example.
- Address 'buy in' at all levels of the community, innovate for a communications strategy that targets the community at a range of levels.
- Connect the community to their environment to establish an understanding of the natural systems that we rely on for our water.
- Utilise urban renewal projects to initiate change.
- Set achievable targets.
- Seek counsel from those who have undertaken the process before.
- Remember that change requires innovation, and to be innovative you need to break the rules.





a case study report prepared by CPG for the IMAP Councils