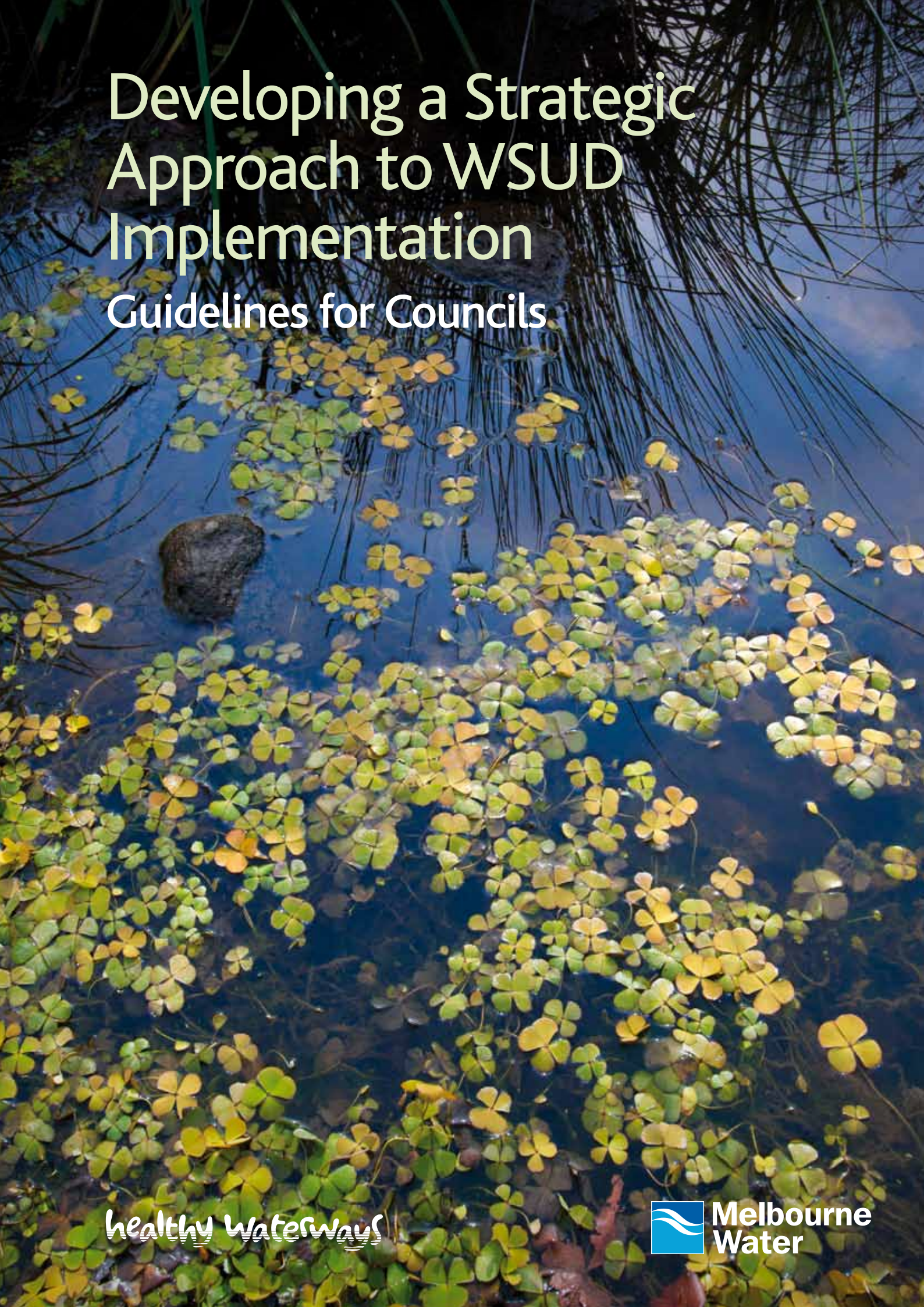
Developing a Strategic Approach to WSUD Implementation

Guidelines for Councils



healthy waterways

Melbourne Water

Contents

PROJECT MANAGEMENT

Halcrow were engaged to prepare these guidelines. Melbourne Water acknowledges the contribution of the Halcrow team, and in particular the project manager, Phil Hughes. Overall project management and technical lead was provided by Marion Urrutiaguer, Melbourne Water.

REFERENCE GROUP

These guidelines were prepared with input from local government through a reference group made of: Nick Walker from Hume City Council, Tony Barrett from Kingston City Council, Elie Touloupis and Daniella Gerente from Knox City Council, Sheridan Blunt and Penny Mueller, from Moonee Valley City Council, and Caroline Chandler from Port Phillip City Council.

Melbourne Water gratefully acknowledges their contribution in the development of these guidelines.

Overview and Purpose

Overview and purpose of these guidelines

Effective implementation of Water Sensitive Urban Design (WSUD) requires a strategic approach to be taken by councils. Experience has shown this can be greatly facilitated by setting targets that provide a clear statement of a council's commitment towards stormwater management and urban water management objectives for their municipality. Such 'WSUD implementation targets' provide a practical means of linking waterway and environmental outcomes to on-ground works to promote an increased understanding of the benefits of individual WSUD projects within a strategic context. Establishing WSUD implementation targets will help council embed WSUD into standard practice.

The main purpose of these Guidelines is to provide councils with guidance on how to successfully develop WSUD implementation targets. An important aspect is to share the experience of councils who have gone through this process. The Guidelines are designed for council officers and managers that are involved in the planning, design and management of WSUD and integrated water management (IWM) programs and initiatives, and development and delivery of WSUD implementation targets.

In their broadest scope, WSUD implementation targets encompass:

- stormwater (reduction of pollutant loads and/or connection of impervious areas to waterways);
- water saving (reduction of potable water consumption);
- alternative water use;
- wastewater reduction; and
- groundwater quality and quantity.

These elements are best considered together as, for example, alternative water use will help reduce both mains water use and pollutant loads. As such, WSUD implementation targets are best developed in the context of integrated water management. For examples of WSUD targets adopted by councils, see Section 5.

It is important to note that while this document considers WSUD implementation targets in the context of integrated water management, more focus is given to establishing WSUD implementation targets, and in particular stormwater management implementation targets, for the protection and restoration of waterways and bays.

A summary of the *Guidelines* is presented in Figure A with an outline of key steps or actions to be considered, major outputs and indicative timelines. Several critical steps are identified in bold boxes. A shortlist of key actions and tasks drawn from the *Guidelines* is further outlined below.

A council will need to carefully review and prioritise which of these actions and tasks are essential to support the development of WSUD implementation targets.

The *Guidelines* are not intended to be a template. The best results will be achieved where the *Guidelines* are carefully reviewed and applied to address the particular circumstances of a council.

Setting WSUD implementation targets as part of an IWM strategy will allow a council to:

- link environmental objectives to implementation;
- embed a strategic approach to WSUD (building from an initial opportunistic implementation);
- translate a vision into commitment to action; and
- set clear directions by linking river health outcomes and WSUD implementation.

WSUD implementation targets will provide strategic direction for a council and enable the development of practical targets for the implementation of "on-ground" stormwater works which translate high level targets, such as in the *State Environment Protection Policy (Waters of Victoria) 2003*, and relate directly to river health outcomes. WSUD implementation targets will support the tracking of progress towards long term goals and drive further action and commitment.

Additional benefits of setting WSUD implementation targets include:

- supporting the adoption of a consistent approach across councils and catchments in Melbourne's region;
- providing council with a strong basis to form or consolidate partnership arrangements with other agencies (e.g. with Melbourne Water's Stormwater Program);
- helping councils participating in the ICLEI Water Campaign to progress their water quality milestones;
- assisting council's reporting on WSUD outcomes; and
- fostering a learning environment that will bring continuous improvement to water management practices.

These *Guidelines* are especially relevant for council officers and managers who are responsible for developing and delivering WSUD implementation targets.

Figure A: Key Steps in developing WSUD Implementation Targets (to sit within a council water plan, WSUD Strategy or IWM Strategy)

Key Step or Action	Major Outputs	Indicative Elapsed Timeline
1. Getting started › consider the role of WSUD implementation targets and obtain approvals (see Section 1) *Aim: Getting started on WSUD implementation targets*	› Approval to prepare WSUD implementation targets	1 to 2 months depending on approval processes
2. Determining the physical characteristics of a council area › assess the physical characteristics and the water balance and diffuse pollutant load of a council area (see Section 2) *Aim: Understanding the physical characteristics of a council area*	› Integrated water and pollutant balance	Up to 4 to 6 months depending on complexity of water balance
3. Current strategic context › develop an overall council vision and framework for WSUD implementation targets (see Section 3) *Aim: Developing a water vision and assessing the strategic context forWSUD implementation targets*	› High-level council water vision › Assessment of the strategic context for WSUD implementation targets	1 to 2 months depending on engagement approach and level of assessment
4. Opportunities for implementation › assess opportunities for implementation of WSUD implementation targets (see Section 4) *Aim: Assessing opportunities on council and non-council land*	› Analysis of apital Works Programs and Budgets › Assessment of opportunities to achieve targets on non-council land	1 to 2 months depending on level of assessment and engagement approach
5. Setting objectives and WSUD implementation targets › develop water objectives and establish WSUD imlementation targets (see Section 5) *Aim: Establishing water objectives and setting robust WSUD targets based on appropriate modelling and costing*	› High-level water objectives › A set of WSUD implementation targets › Scenario modelling and costing to support targets	2 to 4 months depending on level of assessment
6. Capacity to deliver WSUD implementation targets › assess and build capacity in council to deliver on WSUD implementation targets (see Section 6) *Aim: Assess and develop council capacity*	› Assessment of council capacity to deliver WSUD implementation targets › Capacity building program	1 to 2 months depending on level of assessment – capacity building ongoing
7. Mechanisms and funding to achieve targets › assess and link targets to council Capital Works Programs and consider funding options (see Section 7) *Aim: Link targets to Capital Works Program and Budgets*	› Link achievement of WSUD implementation targets to council's Capital Works Program › Define departmental KPIs to monitor progress › Assessment of alternative funding options	1 to 2 months depending on level of assessment
Underlying Processes to Support Key Steps or Actions	**Water Plan, WSUD Strategy or IWM Strategy with WSUD Implementation Targets**	
Engagement processes for developing, adopting and delivering targets › design and undertake engagement (see Section 8) *Aim: Internal and external engagement on WSUD implementation targets*	› Engagement plan(s) › Engagement with all council departments › Engagement with the community and key external groups	As appropriate to support the above steps
Monitoring, evaluation and communication › track and evaluate performance, and communicate results and key learnings (see Section 9) *Aim: Monitoring, evalution and reporting on WSUD implementation targets, and communication of progress on WSUD implementation targets*	› Monitoring, evaluation and reporting processes established and actioned › Communication program established to support delivery	1 to 2 months to establish – ongoing process

Summary of key actions and tasks

Throughout these *Guidelines*, a range of actions and tasks to develop WSUD implementation targets are identified. These actions and tasks are grouped below and should be considered in association with Figure A.

As identified above, a council will need to prioritise when and how it completes these various actions and tasks. The actions may not necessarily be undertaken as part of a linear process and there may be some iterative steps. The timing of completion of various actions and tasks will be dependent on available funding and resourcing.

Getting started on WSUD implementation targets (see Section 1)

- Assess the important role of WSUD implementation targets and how they would best link with other council water management programs and initiatives.
- Consider if WSUD implementation targets would be best located within a council WSUD strategy or in an Integrated Water Management (IWM) or "City as a Catchment" strategy.

Understanding the physical characteristics of a council area (see Section 2)

- Prepare a "fit-for-purpose" integrated water and pollutant balance to inform the development of WSUD implementation targets.
- Consider approaching other councils and/or Melbourne Water for information on how to best conduct an integrated water and pollutant balance.

Developing a water vision (see Section 3)

- Research and develop a high level council vision for water management.
- Undertake appropriate engagement with council officers, executive, councillors and the community in developing the draft and final vision.

Assessing the strategic context for WSUD implementation targets (see Section 3)

- Assess and consider the strategic context for water management and WSUD implementation targets by reviewing key water-related federal, state and local strategies, plans and policies.
- Undertake a review of council's strategic documents related to water management, stormwater management, WSUD, and environmental management including waterways protection.

Assessing opportunities on council-managed land and non-council land (see Section 4)

- Analyse capital works programs, and capital and operational budgets, to identify opportunities to integrate WSUD and to quantify council's scope for implementation (so that council can set achievable targets).
- Consider what opportunities exist to use partnerships, education, incentives, and planning controls to achieve WSUD implementation targets on non-council land.

Establishing water objectives (see Section 5)

- Develop and set high-level water objectives to help frame WSUD implementation targets.

Modelling and costing WSUD implementation targets (see Section 5)

- Undertake scenario modelling and costing to assist in informing council's water objectives and the development of WSUD implementation targets.

Setting WSUD implementation targets (see Section 5)

- Determine what council is trying to achieve, and assess what would constitute a successful outcome or set of outcomes.
- Develop WSUD implementation targets that are consistent with council's strategic aims and water objectives.
- Document what WSUD implementation targets cannot be set at this point in time.

Assessing and developing council capacity (see Section 6)

- Assess council capacity to deliver WSUD implementation targets.
- Engage with other councils when assessing capacity and learn from their experiences.
- Contact Melbourne Water for information on the Needs Analysis.
- Consider designing a capacity building program to target priority areas for improving WSUD knowledge, skills, and processes.

Action planning to enable council to achieve its WSUD implementation targets (see Section 7)

- Consider how best to link the achievement of WSUD implementation targets to council's capital works program planning and delivery.
- Consider how to best link the achievement of WSUD implementation targets to council's management of planning and development.
- Consider developing implementation plans for key delivery areas, and defining departmental KPIs to ensure that overall WSUD implementation targets are achieved.
- Consider alternative funding options to support council funding and investment.

Engagement on WSUD implementation targets (see Section 8)

- Develop an engagement plan to support the development of a water vision and objectives, and WSUD implementation targets.
- Seek early advice and assistance from a council engagement team on the engagement process.

Internal and external council engagement (see Section 8)

- Engage with councillors and council executive early in the development of WSUD implementation targets to identify how they may wish to be involved.
- Engage and interact with all council departments to get input into the development of WSUD implementation targets.
- Consider a range of ways to actively engage with the community and key external groups on WSUD implementation targets.

Monitoring, Evaluating and Reporting on WSUD implementation targets (see Section 9)

- Align and link monitoring of WSUD implementation targets and WSUD programs and actions to existing council monitoring and reporting processes.
- Design an evaluation and reporting process to track WSUD implementation targets and, where possible, make use of existing council reporting processes.
- Plan to periodically evaluate the appropriateness, impact, effectiveness, efficiency and legacy of WSUD implementation targets and associated WSUD programs and activities.

Communicating progress on WSUD implementation targets (see Section 9)

- Develop and implement a communication program to support delivery of WSUD implementation targets and major WSUD programs and activities.
- Seek early advice and assistance from a council communications team.

Explanation of the Guidelines layout

A modular approach has been taken with developing the *Guidelines* and it is intended that each section may be considered on its own.

Throughout the *Guidelines*, coloured highlight boxes are used to identify:

Examples of council responses to WSUD implementation targets.

Further guidance on development of WSUD implementation targets.

Actions and tasks to consider:

potential actions, tasks and responses for a council to consider, such as establishing a water vision and developing WSUD implementation targets.

1 Introduction and Background

1.1 Background to the Guidelines

Stormwater runoff from existing and new urban areas has a major impact on the health of our waterways, catchments and bays, and population growth and reduced rainfall are putting increased pressure on Melbourne's water supplies. Responding to these challenges, along with adapting to the impacts of climate change and variable rainfall[1], requires an increasing focus on a more integrated approach to urban water management and making the most of Melbourne's water resources.

Water sensitive urban design (WSUD) has been described as "the integration of urban planning and development with the management, protection and conservation of the water cycle as a whole"[2]. WSUD involves integrated design and management of the urban water cycle, incorporating water supply, wastewater, stormwater and groundwater management, urban design and environmental protection. WSUD covers a range of measures "that are designed to avoid, or at least minimise, the environmental impacts of urbanisation in terms of the demand for water and the potential pollution threat to natural water bodies".[3]

Traditionally, urban water management has often been separately considered in terms of potable water, stormwater, wastewater and catchment management. However, more holistic concepts, such as WSUD, Integrated Water Management (IWM) and "water sensitive cities", require an integrated approach to all parts of the urban water cycle.

Over the last decade, there has been increasing guidance provided on best practice WSUD design and technologies to address stormwater runoff and recycled water.[4] In more recent time, research has also started to focus more strongly towards the socio-institutional dimensions of WSUD implementation.[5]

1.2 Issues and opportunities in stormwater management

In Melbourne, a primary focus of stormwater management has been to improve the environmental management of stormwater and reduce pollutant loads from stormwater entering waterways and bays. However, with increasing demands on urban water supplies, stormwater management has evolved to also focus on water quantity and promote water reuse. It is also now clear that we need to better manage stormwater runoff flows volumes and frequencies to achieve healthy waterways. More innovative approaches to stormwater management using WSUD principles can turn rainwater and stormwater into a water resource and assist with improved management of stormwater flows (see Figure 1.1 on following page).

WSUD involves integrated design and management of the urban water cycle.

1 Howe, C., Jones, R.N., Maheepala, S., Rhodes, B. 2005, *Implications of Potential Climate Change for Melbourne's Water Resources*, CSIRO for Melbourne Water, Melbourne.

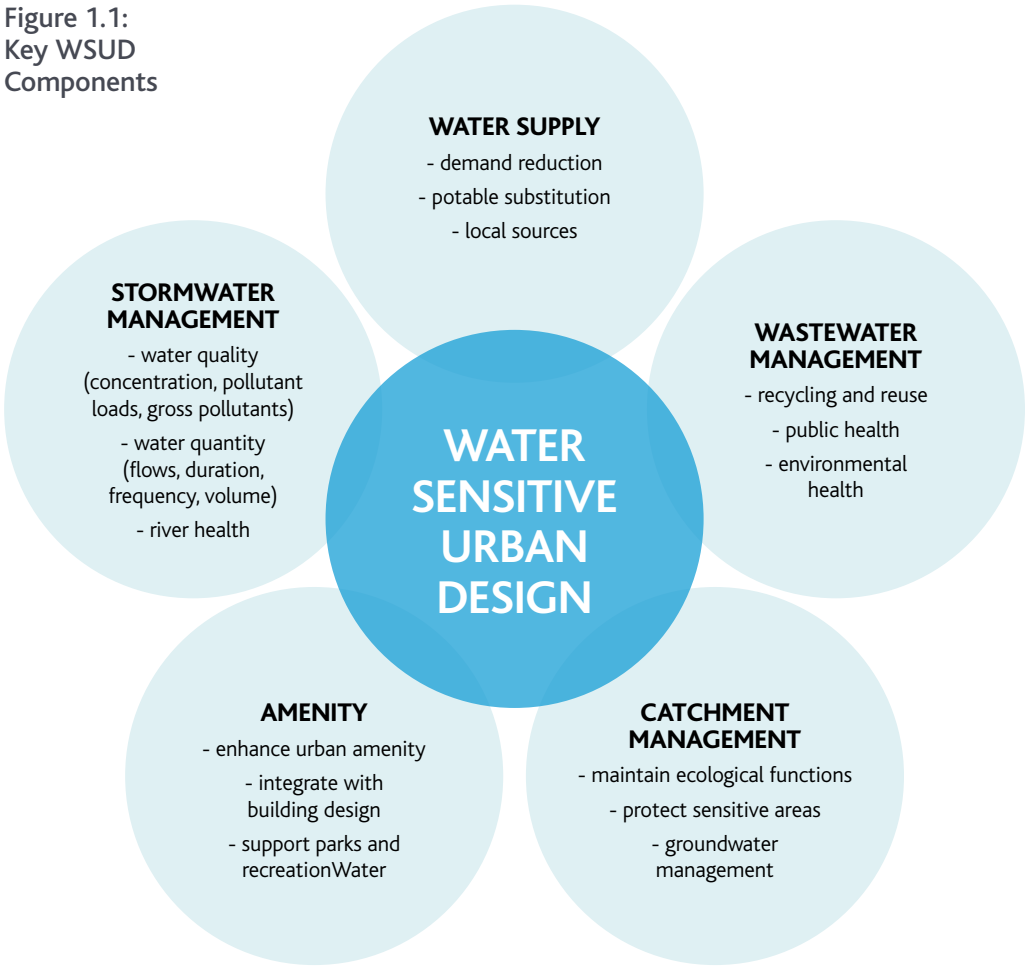
2 Melbourne Water 2004, *Essential facts, Water-sensitive urban design*, Melbourne.

3 City of Melbourne 2009, *WSUD Guidelines, Applying the Model WSUD Guidelines*, Melbourne, p. 4.

4 For example, see Victorian Stormwater Committee 1999, *Best Practice Environmental Guidelines*, CSIRO Publishing, Melbourne; City of Melbourne 2009, *WSUD Guidelines, Applying the Model WSUD Guidelines*, Melbourne; and Joint Steering Committee for Water Sensitive Cities 2009, *Evaluating Options for Water Sensitive Urban Design – A National Guide*, Canberra.

5 For example, see: Brown, R. and Clarke, J. 2007, *The transition towards Water Sensitive Urban Design: the Story of Melbourne, Australia*, Report of the Facility for Advancing Water Biofiltration, Monash University, Melbourne; and Taylor, A. 2008, *Leadership in Sustainable Urban Water Management: An Investigation of the Champion Phenomenon within Australian Water Agencies*, Report No. 08/01, National Urban Water Governance Program, Monash University.

Figure 1.1:
Key WSUD
Components



Source: adapted from Joint Steering Committee for Water Sensitive Cities 2009, *Evaluating Options for Water Sensitive Urban Design – A National Guide*, Canberra.

1.3 Roles and responsibilities

Various State Government agencies along with local councils are responsible for different aspects of water management in the Port Phillip and Westernport region. Achieving healthy waterways will require collaboration and commitment across the region.

As the caretaker of river health, Melbourne Water works collaboratively with councils and other stakeholders to achieve healthy rivers, creeks and other water bodies. Melbourne Water has implemented stormwater programs and initiatives to work with councils to improve stormwater management. In 2008, these programs and initiatives were combined into the *Living Rivers Stormwater Program* which offers support and funding to councils to build their capacity to implement sustainable stormwater management.

Projects developed under the program include on-ground works but also strategic projects, and are designed to empower local governments to implement WSUD for the management of stormwater.

As a local planning and public health authority, councils have a broad range of direct and indirect water management responsibilities. Councils are responsible for local drainage networks and maintenance, and connection to Melbourne Water regional drainage systems. Through the management of stormwater and local drainage, management of land use through the planning system, and land management activities, councils have an important role to play in protecting river health and improving water quality in waterways and bays (see Box 1.2).

Box 1.2: Council Stormwater Responsibilities

Councils play a significant role in improving the environmental management of urban stormwater. These include obligations under the *State Environment Protection Policy – Waters of Victoria*. In relation to urban stormwater, these are to:

- develop stormwater management plans
- implement effective management practices particularly from new developments and drainage systems
- prevent wastewater discharges to stormwater drains
- monitor and report to the community and relevant stakeholders on the impact of stormwater drains on surface waters
- ensure new and retrofit developments include effective design measures and practices to manage stormwater runoff volumes and minimise runoff of pollutants in stormwater, and
- provide educational material on stormwater management and pollution avoidance measures.

Source: EPA Victoria 2007, *Councils and Stormwater*, EPA website.

Box 1.3: City of Kingston Integrated Water Cycle Strategy

City of Kingston has been implementing a range of sustainable water management initiatives including stormwater quality management and potable water conservation measures. In 2008, the City of Kingston decided that separate management plans for stormwater quality management and sustainable water use were not assisting an integrated approach to urban water management. A more integrated framework was required to ensure all water projects were implemented in a coordinated and prioritised way.

In response, the Council is developing a holistic Water Cycle Strategy to address stormwater management, potable water conservation, ground water conservation and protection, and wastewater management. The water cycle strategy will prioritise actions and help ensure that projects are implemented in an integrated and strategic manner.

Source: City of Kingston 2009, Preparation of a Kingston Water Cycle Strategy, Council Report.

Many councils have implemented WSUD projects to improve stormwater quality and are increasingly looking for direction and support to address WSUD more strategically. As a result, a number of councils have established WSUD implementation targets with the support of Melbourne Water, providing them with a strategic statement of council water objectives for their municipality, along with priority actions and measures (for example, City of Melbourne's *Total Watermark*, 2009 and City of Port Phillip's *Water Plan*, 2010).[6]

Councils are also actively implementing WSUD from a water supply perspective. This can include substituting the use of potable drinking water with alternative water sources for the irrigation of open space and sporting fields, and improving water efficiency in public buildings and facilities. Some councils, such as Melbourne, Port Phillip and Kingston, are taking the opportunity to embed WSUD implementation targets within a water cycle framework to further integrate urban water management (see Box 1.3).

Getting started on WSUD implementation targets (also see Section 3):

- Assess the important role of WSUD implementation targets and how they would best link with other council water management programs and initiatives.
- Consider if WSUD implementation targets would be best located within a Council WSUD strategy or in an IWM or "City as a Catchment" strategy.

6 See: City of Melbourne 2009, City as a Catchment Strategy, and City of Port Phillip 2010, Water Plan, Toward a Water Sensitive City.

2 Physical Characteristics of a Council Area

Key Points

An integrated water and pollutant balance provides the basis for setting implementation targets on different aspects of the water cycle.

A range of organisations have data and information that is required to prepare an integrated water and pollutant balance.

A water and pollutant balance is more useful for target setting and strategic planning but not necessarily for detailed sub-catchment planning.

A thorough integrated water and pollutant balance is expected to take around 3 months to prepare. A good data collection process will help to minimise any potential delays.

A simpler water and pollutant balance will take less time but will be based on more assumptions and will have less value.

2.1 Introduction

The physical characteristics and catchment properties within a municipality, such as landuse, amount of impervious area, and rainfall characteristics, strongly influence the amount of stormwater that is generated and subsequent impacts on river health.

Integrated water management (IWM) requires sound knowledge of water sources and flows, their inter-relationships and the risks and opportunities they present. An integrated water and pollutant balance assists a council to better understand the total water cycle including:

- all water entering and exiting a municipality
- stormwater flows and pollutants generated within as municipality, and
- traditional and alternative water sources to meet municipal water demand.

This section briefly outlines the role and value of an integrated water and pollutant balance, and key data requirements and assumptions to inform the setting of WSUD implementation targets.

2.2 Understanding the catchment

The role of an integrated water and pollutant balance

To understand water flows within a council catchment, it is important to consider the water cycle. The water cycle describes the various routes by which water moves from the atmosphere to the land surface and returns to oceans via surface runoff and subsurface drainage paths *(a conceptual diagram of the water cycle is illustrated in Figure 2.1)*.

The physical aspects of a water cycle can be modelled through a water balance. "A water balance is a mass balance accounting for water entering, accumulating and exiting a system. It includes rainwater, potable mains water, evapotranspiration and infiltration, wastewater and stormwater."[1]

The water balance could either account for flows generated within the municipality only, or also quantify flows generated externally which travel through the municipality.

A pollutant balance quantifies the passive diffuse source pollution carried by stormwater discharging to waterways. Passive diffuse source pollution results from natural processes or passive human behaviours throughout the catchment. The pollutants generally taken into account are suspended solids, phosphorus, and nitrogen. It does not cover point source pollution (e.g. direct and illegal discharge of industrial effluents).

1 Melbourne Water and City of Melbourne 2009, *WSUD Guidelines, Applying the Model WSUD Guidelines,* Melbourne, p. 165.

An integrated water and pollutant balance quantifies water flows and incorporates a detailed accounting of:

- mains water use and groundwater use;
- wastewater discharge; and
- stormwater flows and pollutant loads.

Integrating a pollutant balance into the water balance provides a council with a holistic approach to modelling stormwater flows and passive diffuse source pollution. This modelling is often realised with Model for Urban Stormwater Improvement Conceptualisation (MUSIC).

An integrated water and pollutant balance will help council to understand the water cycle within the municipality and provides a strong basis for setting WSUD implementation targets and informing future WSUD actions.

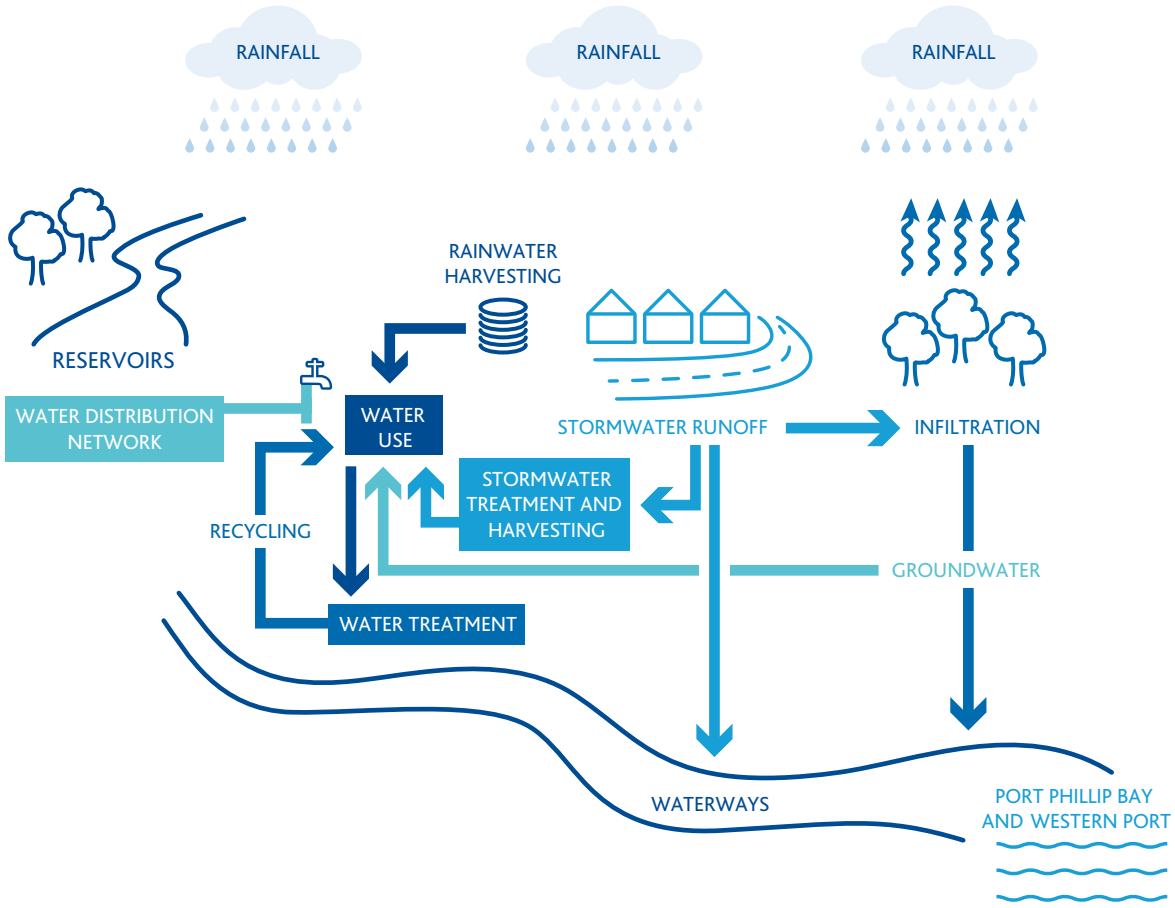
A water and pollutant balance promotes improved understanding of:

- a municipality's water cycle;
- the amount of water use and wastewater generated in a municipality;
- opportunities for stormwater harvesting and water reuse and recycling, for example, from sewer pipes that pass through a municipality; and
- impacts of stormwater on local rivers and other water bodies.

A water and pollutant balance for a whole municipality could be disaggregated by:

- sub-catchment;
- land ownership: council owned and managed, and non-council owned (potentially with further differentiation between State Government and private owners);
- landuse: road, open space, residential, commercial, industrial and other; and
- type of surface: road, roof, other impervious, and pervious.

Figure 2.1: Conceptual Integrated Water Cycle



An integrated water and pollutant balance is also a powerful communication tool that facilitates discussions relating to water management.

It will also strongly assist the setting of WSUD implementation targets that accurately reflect the local catchment and council context. For example, targets to improve the pollutant balance could be set as percentage reduction of the total suspended solids or total nitrogen load or generated within the municipality. Similarly, targets could be established for potable water use, wastewater generation and recycling, and groundwater use. For instance, a council could set a target to reduce the quantity of potable water use and wastewater production in new developments.

Further information regarding WSUD implementation target setting is presented in Section 5.

Importantly, an integrated water and pollutant balance will assist in developing systems and tools needed to plan, assess and track WSUD projects and enable a council to build up their knowledge base. For example, from the water balance, water saving options can be analysed and results presented in graphical and tabular formats. For example, see the City of Port Phillip *Water Plan, Toward a Water Sensitive City*.

Developing an integrated water and pollutant balance is an elaborate and technical exercise. Engaging external expertise may facilitate council to undertake the necessary work.

A section of a brief from Brimbank City Council for developing a water balance as part of a holistic sustainable water management strategy is in Appendix A2.1.

A water balance may vary significantly from council to council, due to regional differences in rainfall, landuses and other physical characteristics. An example of an approach to a water balance is provided in Box 2.1.

Box 2.1: Calculating a Water Balance to Drive Future Directions

The City of Kingston prepared a water balance as a part of the development of a Water Cycle Strategy. The water balance accounts for the stormwater generated from the municipality, as well as the potable water used, and the wastewater generated and reuse opportunities. The water balance provides Council with an understanding of the water used within the municipality, and the impact of increased urban runoff from impervious areas on local rivers and creeks.

The water balance will also provide the basis for many future functions within Council including:

- defining achievable and sustainable targets for sustainable water cycle management
- allowing the integration of WSUD into capital projects (e.g. building design or road works)
- initiating a monitoring, evaluation and reporting program
- dentifying best practice opportunities for water management projects and prioritising these in terms of water conservation, water quality and payback period, and
- encouraging the adoption of sustainable water cycle management across the organisation.

Source: *City of Kingston, CLG Report Preparation of a Water Cycle Management Strategy*.

Incorporating Climate Change and Population Growth

Understanding the water balance in relation to catchment characteristics provides council with an insight into the catchment processes which operate over a range of spatial and temporal scales. For example, a council can use the model to quantify the effect of landuse change on the water balance, and predict pollutant loads and streamflow in local waterways.

Council's water balance can also incorporate climate change by implementing different rainfall scenarios. Population growth and development scenarios can be considered by altering the amount of impervious areas. These scenarios will influence the amount of runoff generated from council's urban environment, as well as demands.

2.3 Understanding the impacts of stormwater on the receiving waters

A good knowledge of the condition and threat to receiving waters across its municipality, will help council to identify where it want to focus its actions to protect these assets.

Stormwater discharge to waterways has been identified has the most limiting factor to waterways health. As such, gaining a better understanding of how stormwater runoff from urbanised catchment is connected to waterways can help determine actions required in the catchment to protect waterways.

Directly Connected Imperviousness (DCI)

Directly Connected Imperviousness, DCI, is defined as the proportion of a catchment covered by impervious surfaces directly connected to a stream via stormwater pipes.

When it rains on an undeveloped catchment, the water infiltrates, or evaporates and evapo-transpires. As such, surface runoff reaches the stream only during intense events (typically only 4-8 days a year)[2]. The infiltrated water slowly reaches underlying groundwater, which provides baseflows to the streams. In urbanised catchments, each times it rains, runoff from directly connected hard surfaces is generated and drains to the streams. In simple terms, this means that urban streams receives too much water too often, and at the same time are deprived from natural baseflows from groundwater.

Box 2.2: Impact of stormwater runoff

0 – 0.5%	Impact of stormwater flows on stream ecology not detected
0.5 - 2%	Impact of stormwater flows on stream ecology detectable in most streams
2 – 5%	Impact of stormwater flows on stream ecology observed in all streams
5 – 10%	Significant impact of stormwater flows on stream ecology observed in all streams
> 10%	Streams severely degraded by stormwater flows

A growing body of research demonstrates that both volume and frequency of stormwater runoff generated from impervious surfaces, and directly connected to waterways through traditional drainage systems, are a strong contributing factor to poor waterway health[3] and generally a limiting factor to urban streams' ecological condition.[4]

Based on current research below (see Box 2.2) proposes a categorisation of impact of stormwater runoff volumes and frequencies of discharge to receiving streams according to DCI values.

Research shows that we need to reduce DCI to around 2% or less to see improvement in the ecological condition of urban streams and, eventually, return them to a healthy state. In terms of an environmental flow regime for urban streams, this means returning flow volumes, the frequency of overland flow and soil infiltration rates all back to near natural. These three objectives are being tested in the Little Stringybark Creek pilot project are likely to form the next generation of urban flow objectives.[5]

The Little Stringybark Creek project is showing that to protect and restore urban flow regimes, and hence protect stream health, stormwater harvesting must be carried out in conjunction with WSUD treatment systems that are designed to meet the flow volume, frequency and baseflow objectives as well as treat the quality of the water. These objectives are most easily achieved if harvesting is carried out before it enters the drainage system.

DCI values have been generated for most catchment that drains to a waterway in the Port Phillip and Western Port catchment. As these *Guidelines* were being prepared, the DCI dataset was being finalised and a set of maps commissioned. This information can be provided by Melbourne Water to councils on request.

DCI data could potentially be used to identify high-value catchment where WSUD works could be prioritised to achieve large environmental outcomes.

In high-value catchments, additional objectives on flow frequencies and volumes could be established to ensure hydrological regimes of a local creek are not significantly changed from pre-development conditions.

2 Fletcher T.D. & Walsh J.W. (2007). Formulation and assessment of an allotment-scale flow objective for protecting receiving waterways. Benchmark Environmental Consulting.

3 Walsh, C.J., Fletcher T.D., and Ladson A.R. 2005a, *Stream Restoration in Urban Catchments through Redesigning Stormwater Systems: Looking to the Catchment to Save the Stream*. Journal of the North American Benthological Society. 24(3), 690-705.

4 Danger A. and Walsh C.J. 2008, Management options for conserving and restoring fauna and other ecological values of urban streams in the Melbourne Water region. A report to Melbourne Water.

5 See: Little Stringy Bark project at: http://www.urbanstreams.unimelb.edu.au/LSmonitoring.htm

Point source

Point source pollution has severe impacts on waterways. As such, pollutant hotspots could be another area of focus for council. Knox City Council have included a Hotspots Program as part of the activities proposed in their WSUD & Stormwater Management Strategy and have planned to undertake a desktop analysis of hotspot pollution areas through risk-based prioritisation using land maps, target areas for pollutant loads, especially industrial zones and commercial areas for litter.[6] Similarly septics might be an issue for some councils.

2.4 Data requirements and sources

As noted previously, the development of an integrated water and pollutant balance requires a range of data and information to make hydrological predictions at a catchment scale, and model the pollutant load. For the model to be practical, it requires a number of data inputs and model parameters and assumptions. Inputs to the model include climate data (rainfall and evapotranspiration), catchment data (pervious and impervious areas, storage), and water usage (potable water used and wastewater generated).

In order to complete the water and pollutant balance, data and information is required from a number of sources on the following:

- a breakdown of land uses and ownership (council, private) within a municipality
  - City of Port Phillip for eample analysed land use as per current town planning zones, and then aggregated to five land use categories: Residential, Commercial/Industrial, Road, Open Space and Other. Drainage sub-catchments and imperviousness were based on an imperviousness GIS layer supplied by Melbourne Water.[7]
- A breakdown of surfaces type (road, roof, other impervious, pervious) within a municipality
  - Road areas can be identified using a total imperviousness GIS layer that can be provided by Melbourne Water (this layer shows imperviousness surfaces across the region and differentiate roads from parcels)
  - Roof areas are not mapped but can be estimated. This analysis was undertaken as part of the City of Port Phillip water and pollutant balance. The proportion of roof and other impervious areas showed significant differences within land uses.[8] The methodology used to identify roof areas consisted of assessing the proportion of roof on parcels through a visual inspection, and assigning different roof proportion to relatively homogenous areas (e.g. suburb, sub-catchment).[8]
- directly connected imperviousness (DCI), the proportion of a catchment made up of impervious surfaces draining directly via a pipe or constructed channel into a waterway) (also see Section 2.6)
- pollutant concentrations:
  - MUSIC provides default values of event mean concentrations for Total Suspended Solids (TSS), Total Phosphorus (TP) and Total Nitrogen (TN) generated by impervious surfaces in an urban catchment. It is worth considering using values more representative of the pollution generated by specific land type (e.g. roofs, roads) if the water balance is provided with this break-down. City of Melbourne and City of Port Phillip adopted Fletcher et al. (2004)[10] pollutant concentrations for roads, roofs, other impervious and pervious surfaces. See appendix A2.2.
- meteorological data, such as rainfall and evaporation:
  - City of Port Phillip used rainfall and evapo-transpiration data from the Bureau of Meteorology Melbourne Regional Office gauge (86071). A recent rainfall data set consisting of 10 years of data was selected for analysis July 1996 - June 2006. This took into account drier conditions than the long term average and is considered to be a reasonable representation of likely future conditions given expected climate change and a trend towards less rainfall.

6 *Knox City Council 2010,* Water Sensitive Urban Design and Stormwater Management Strategy 2010, p. 18.

7 City of Port Phillip 2010, *Water Plan, Toward a Water Sensitive City*, p. 75.

8 EDAW 2009, *City of Port Phillip Integrated Water Management Strategy*, Melbourne, pp. 49-50.

9 Fletcher, T. et al. 2004, *Stormwater Flow and Quality, and the Effectiveness of Non-Proprietary Stormwater Treatment Measures – A Review and Gap Analysis*. CRC for Catchment Hydrology Report 04/8.

- potable water use and demand management
  - City of Port Phillip potable water use was calculated based on data provided by South East Water for 2000/01 to 2007/08. A baseline of 2000/2001 was adopted by council
  - City of Melbourne used Smartwater rebates data for uptake of demand management strategies and rainwater tanks along with information from City West Water and South East Water[10]
- wastewater generation, typically estimated from potable use using assumed sewage discharge factors
- water quality:
  - City of Melbourne used information from Melbourne Water
- waterways information, such as river health and stream and river flows:
  - City of Melbourne used Melbourne Water data on river flows
- the contribution of existing WSUD treatments, for example, to achieve pollutant reduction and flood mitigation, and
- modelling of the benefits of current WSUD treatments and the aggregation of this data:
  - City of Port Phillip and City of Melbourne undertook this modelling.

Understanding model limitations and assumptions

It is essential that there is a clear understanding of a water balance model inputs, key assumptions, outputs and limitations, in order to know what will have the greatest impact. For example, changes in model inputs, such as directly connected impervious area, will increase or decrease the amount of stormwater generated.

A water balance model is generally limited by the accuracy of input data and the validity of assumptions made. Effort required to improve data must however be balanced against the potential benefits and costs. For example, it may be acceptable to make an assumption on per capita water use, rather than spend time and resources obtaining and manipulating actual water use based on measurement and metering.

Assumptions made within the water balance model are generally based on data input requirements. Depending on the complexity of the model, potential assumptions may include:

- evaporation and transpiration;
- soil moisture and infiltration rates and the relationship between surface water and groundwater;
- council-wide water use and wastewater discharge; and
- groundwater data and use.

Results of the model should be validated against available data where possible to check the assumptions used.

Overall, water balances are more useful for strategic planning and target setting than for detailed sub-catchment planning. Although it may also be used to determine major opportunities, additional modelling will generally be required to identify and scope WSUD projects.

2.5 Accounting for existing WSUD

The net benefit achieved from council's existing WSUD and urban water management initiatives, such as the total reduction of pollutants and flow, can be accounted for through the pollutant balance. This process uses MUSIC models to estimate the total reduction in flow, suspended solids, total phosphorus and total nitrogen.

The performance of the implemented WSUD measures can then be recorded into a data management systems (e.g. simple spreadsheet, asset management system). Consideration should be given to keeping this record updated with new projects as it will facilitate reporting against targets. It could also be used for maintenance purposes. As such, council should determine what processes and data management systems are best suited to recording and tracking of WSUD projects (also see section 9).

Understanding the physical characteristics of a council area:

- Prepare a "fit-for-purpose" integrated water and pollutant balance to inform the development of WSUD implementation targets.
- Consider approaching other councils and/or Melbourne Water for information on how to best conduct an integrated water and pollutant balance.

10 City of Melbourne 2009, *City as a Catchment Strategy*, p. 55.

3 Current Strategic Context

Key Points

A council vision for water management will define long-term goals and aspirations, and provide a clear focus for WSUD implementation targets.

Understanding the strategic context for water management will assist council in developing appropriate WSUD implementation targets.

3.1 Introduction

A range of council, state and federal strategies, policies, and commitments provide the strategic context and support for WSUD implementation targets. This section discusses the role of a council vision on water management, and key considerations when developing such a vision. This section also outlines the broader strategic context for WSUD implementation targets covering council, state and federal strategies, policies, and commitments with more detailed information in Appendix A3.1.

3.2 A vision for water management

An organisational vision for water management will clearly define long-term water goals and aspirations. It will guide development of WSUD implementation targets and provide a clear focus for its WSUD strategic objectives. An effective water management vision will be clear and inspirational and align with an organisation's broader values and culture.[1]

A well-defined vision statement provides a council with a clear set of directions and expectations to frame its entire water management strategy. A vision can guide council's strategy development and provide a clear focus for its WSUD implementation targets. A vision can encourage relevant departments of council to consider WSUD, for example, within capital works, and outline to the community the council's preferred direction for water management.

Box 3.1: What is a Vision?

A vision is a concise statement that defines medium- to long-term goals and objectives. A vision should be expressed in aspirational terms, and ideally be short, simple, unequivocal, memorable and long-term. A council's water management vision will clearly articulate what a council aims to achieve in terms of water management and WSUD implementation targets.

Source: Kaplan et al. 2008, *Balance Scorecard, Developing the Strategy: Vision, Value Gaps, and Analysis*, Harvard Business School Publishing.

As part of its *WSUD and Stormwater Management Strategy 2010*, Knox City Council developed a long-term WSUD vision statement with an accompanying summary vision (see Box 3.2).

Box 3.2: An Example of a WSUD Vision Statement

Knox City Council, summary WSUD vision statement:

"WSUD will contribute to a more liveable, sustainable and productive municipality."

Knox City Council, WSUD vision statement:

"A municipality with healthy, beautiful and lush green corridors along streams, creeks and lakes, full of biodiversity, which can be enjoyed by us, by our children and their children.

A community that values stormwater as a resource and understands the need to protect waterways from stormwater inputs.

A municipality where all homes, industrial business districts and commercial precincts have WSUD systems such as raingardens and rainwater tanks, that retain water within the catchment, allowing it to be infiltrated, filtered and purified through natural process, so that our creeks and streams have natural flows unaffected by urbanisation.

A municipality that can sustain the majority of its watering and drainage needs through the use of stormwater captured via stormwater tanks and WSUD systems. Stormwater will be used to keep the landscape green and cool, even during summer.

A community that values waterways, and therefore works with the Council in achieving healthy streams and creeks and maintaining them.

A community and Council who work in partnership with upstream and downstream neighbouring Councils and agencies to manage the region's waterway's in a sustainable and cost-effective manner."

Source: Knox City Council 2010, *Water Sensitive Urban Design & Stormwater Management Strategy 2010*.

1 Adapted from: Strandberg Consulting 2006, *Developing a Sustainability Vision and Management System*, Burnaby, British Columbia.

Developing a vision for water management

Developing a vision for water management will require consideration of:

- the nature of the focus on water management, for example, on the complete water cycle or only on stormwater management;
- a timeframe for the vision, for example, 20 or 50 years; and
- the need to engage with key stakeholders across council and with the community (also see Section 8 on Engagement).

The process used for establishing a vision can create a sense of ownership in water management and build strong networks and relationships for delivery of WSUD implementation targets. A council could:

- establish a representative vision committee to bring relevant stakeholders together to discuss and draft the vision statement:
  - this could involve input from council departments including engineering, environment, planning, urban design, parks, etc.
- test the vision statement through a workshop(s) with key stakeholders:
  - it will be important to engage with council executive and councillors early to gain their support for the vision statement
  - gain approval and signoff of the vision statement from council executive and councillors.

Appendix A3.1 outlines further considerations in relation to developing a council vision for water management.

Actions to consider by council in developing a water vision:

- Research and develop a high level council vision for water management.
- Undertake appropriate engagement with council officers, executive, councillors and the community in developing the draft and final vision.

3.3 Strategic context for WSUD implementation targets

The strategic context for WSUD implementation targets includes local, state and federal strategies, policies, and commitments on water management. Understanding the strategic context is essential for a council when developing and setting WSUD implementation targets.

Assessing the strategic context

A range of federal and state agencies, along with local councils, share responsibility for urban water management, water quality and river health. At times, federal and state policy and legislation will require a council to undertake specific actions, such as improving water efficiency or preparing water management plans.

An assessment of the strategic context for water management can be undertaken through a review of relevant local, state and federal strategies, and policies and commitments relating to water management. This strategic context provides direction and focus for council's WSUD implementation targets, and will help to ensure that the targets are consistent with it.

Key federal and state strategies and legislation, and council's strategies and plans relevant to development of WSUD implementation targets are shown in Figure 3.1.

Key provisions from selected water-related strategies and plans are highlighted below with further information provided in Appendix A3.2:

- *State Environment Protection Policy (Waters of Victoria) 2003*: the purpose of the *State Environment Protection Policy (Waters of Victoria) 2003* is to help achieve sustainable surface waters by:
  - setting out the environmental values and beneficial uses of water that Victorians want, and the environmental quality required to protect them; and setting, within a ten year timeframe, goals for protection agencies, businesses and communities and means by which they can be met
  - *SEPP Schedule F6 (Waters of the Port Phillip Bay)* defines requirements for nutrient management within Port Phillip Bay, with an annual nitrogen load reduction of 1,000 tonnes. *Schedule F7 (Waters of the Yarra Catchment)* "protect the beneficial uses of Port Phillip Bay from the effects of sediment and wastes transported by the Yarra River". *SEPP (Groundwaters of Victoria)* also sets out requirements for protecting groundwater.

- Clause 17 of the SEPP (Waters of Victoria) outlines that:

  "Municipal councils play an important role in protecting surface waters through a number of responsibilities, including stormwater, floodplain, drainage, and vegetation management, domestic wastewater management including septic tank approvals, local road management and landuse planning."

  "Municipal councils plan for and approve landuse activities through the Victorian Planning Provisions (VPP), Municipal Strategic Statements (MSSs) and planning permits. The SEPP recognises and supports the provisions of the VPP, which require municipal councils to ensure that their strategic and statutory planning tools and permits are consistent with SEPPs."

- Municipal Strategic Statement (MSS):
  - A council's MSS outlines the 10-15 year vision for landuse, planning and development in the municipality. This includes the key issues facing the community, council's strategic vision, and the objectives and strategies to achieve this vision.
  - A council may seek to amend its MSS to strengthen the strategic basis for the introduction of WSUD requirements, through inserting a new local policy that introduces statutory requirements for the incorporation of WSUD for new development and subdivision (also see Section 4).
- *Melbourne 2030*: aims to "ensure that water resources are managed in a sustainable way". *Melbourne 2030* addresses promotion of water efficient practices, adoption of guidelines to encourage the use of alternative water sources, such as rainwater tanks and water recycling, and a reduction in the impact of stormwater on bays and catchments.

Assessing the strategic context for WSUD implementation targets:

- Assess and consider the strategic context for water management and WSUD implementation targets by reviewing key water-related federal, state and local strategies, plans and policies.
- Undertake a review of council's strategic documents related to water management, stormwater management, WSUD, and environmental management including waterways protection.

Figure 3.1: Water-related legislation, strategy and planning framework for councils in the Port Phillip and Westernport Region

Local Council

Council Plan

Municipal Strategic Statement
- Local Planning Policy

Other Council Plans & Strategies including:
- Environment Strategy
- Stormwater Plan
- WSUD Strategy
- Water Plan
- Open Space Plan
- Flood Management Plan
- Master Plans & Structure Plans
- Etc

State Legislation:
- *Local Government Act 1989*
- *Environment Protection Act 1970*
- *Water Act 1989*
- *Planning & Environment Act 1987*
- *Building Act 1993*
- *Catchment &Land Protection Act 1994*

State Strategies & Plans:
- Central Region Sustainable Water Strategy
- Victorian River Health Strategy
- Regional Catchment Strategy
- Flood Management & Drainage Strategy
- Better Bays & Waterways Plan

Statutory Planning:
- Victorian Planning Provisions
- Melbourne 2030

State White Paper:
- Our Water, Our Future
- Climate Change
- Land & Biodiversity

Environment:
- State Environment Protection Policies: Waters of Victoria

Federal Framework:
- National Water Initiative
- Water for the Future

4 Opportunities for Implementation

Key Points

A wide range of opportunities exist on council-managed land and non-council land for achieving WSUD implementation targets.

Analysing capital works program will provide council with a baseline to quantify achievable targets.

Analysing capital works program will also help council to maximise opportunities for implementation of WSUD on council land.

On non-council land, opportunities exist to use partnerships, education, incentives, and planning controls to achieve WSUD implementation targets.

4.1 Introduction

There are a wide range of opportunities to implement WSUD and improve water management, river health and urban amenity. WSUD can be considered in all parts of a council's operations, including capital works, asset renewal and rehabilitation, maintenance, parks, facilities and planning. In addition, WSUD can be applied on non-council land through partnerships, education, and the planning system, to support best practice water management.

Having gained a better understanding of its water cycle and waterways, (see Section 2) and defined its vision for water management and river health, (see Section 3), identifying opportunities for implementation will help council to understand scope for implementation and define appropriate WSUD implementation targets.

This section:

- considers WSUD opportunities on council land through capital works and asset renewal, and provides guidance on how to analyse capital works;
- highlights WSUD opportunities on non-council land through partnerships with other landowners, community engagement, incentive programs and planning controls; and
- considers WSUD opportunities for education, encouragement and enforcement.

4.2 Opportunities on council land

There are many opportunities for delivering on WSUD implementation targets on council land including:

- incorporating WSUD in all new capital works programs and projects;
- integrating WSUD into roads, drainage and streetscape maintenance works and renewals;
- implementing water efficient measures for council facilities, sportfields, parks and gardens;
- establishing raingardens, bioretention tree pits and passive irrigation in appropriate locations, such as roads, laneways, carparks, nature strips, sunken roundabouts and kerb extensions; and
- undertaking stormwater harvesting for open space, parks and gardens.

A wide range of opportunities exist for achieving WSUD implementation targets by council.

Methods to analyse capital works

In the delivery of services to the community, many departments within a council will undertake or have the potential to apply WSUD in their projects and operations.

In order to adopt WSUD as a standard practice within council, opportunities to increase the application of WSUD will need to be sought by all departments. As such, council's annual capital works program should to be analysed to help identify major capital works programs and projects that provide opportunities for the application of WSUD. This could include road renewal, new facilities and renovation of existing ones, open space developments, and streetscape and urban design projects that provide opportunities for a wide range of WSUD measures.

Key steps to consider when analysing council's capital works program for opportunities to increase the application of WSUD involve:

1. identifying council departments that have opportunities to integrate WSUD in all projects:
   - these may include departments, such as Engineering, Urban Planning, Property and Facilities, Open Space and Parks, Maintenance, and Community Services and Leisure
2. identifying and analysing the respective WSUD opportunities for each of the council departments identified in (1) above. WSUD opportunities will vary between departments, and may include, for example:
   - design and construction of road and drainage works
   - design and construction of streetscape works
   - open space and sports ground management
   - parks, gardens, and street level vegetation
3. identifying the structural water management considerations (those related to the installation and maintenance of assets) for each council department
4. identifying the non-structural water management considerations (those related to guidelines, regulation, education etc.) for each council department, and
5. from (3) and (4) above, identifying suitable capital works opportunities for the application of WSUD.

This process has two broad purposes:

- identification of opportunities as a baseline to quantify achievable targets; and
- identification of opportunities to be implemented in annual capital planning, and also through longer five to ten year works program cycles.

Box 4.1 (see next page) provides an example of how councils may seek to identify departmental WSUD opportunities.

Undertaking the above analysis of council's capital works program, and identifying WSUD opportunities of individual council departments, will assist in identifying opportunities for increasing the application and understanding of WSUD across council.

WSUD initiatives are more cost effective if incorporated into asset management and maintenance programs. Streetscape works or traffic calming projects, for example, are projects typically delivered as part of a council's capital works program, and these projects provide excellent opportunities for WSUD retrofit and in particular small raingardens or tree pits. Incorporating WSUD measures into planned drainage or streetscape works can help to progress a cultural change in council and across different departments.[1]

WSUD opportunities are not just limited to hard infrastructure installations. For example, council may be able to use an operational maintenance budget for tree planting in WSUD treatments, and seek to enhance water conservation across all council facilities and operations. It is important to look right across council when implementing WSUD and not just rely on one budget and department for funding.

There are also external opportunities that may be available to council. For example, water retailers, water authorities or neighbouring councils may be undertaking projects and programs, or may be willing to undertake projects, where council could be a partner (for example, see Box 4.2 opposite). This can help to maximise exposure to WSUD, IWM and water management on a regional scale.

This analysis of capital works programs may be undertaken by WSUD officers, engineers and/or other analysts within a council. It will likely require cross-departmental input to obtain the best results given that information will be located in different departments.

1 For further information refer to Melbourne Water and City of Melbourne 2009, *WSUD Guidelines Applying the Model WSUD Guidelines*.

Box 4.1: Example of council department WSUD opportunity analysis

The following table provides an example of an analysis of WSUD opportunities across a council.

Council department	WSUD opportunities	Structural IWM	Non-structural IWM
		Related to the installation and maintenance of assets	**Related to guidelines, regulation, education etc.**
Open Space	Sports ground management Maintenance, planning and design of open space Maintenance of stormwater treatment devices (landscape) Waterway revegetation Wetland development Street level vegetation Planning referrals – landscape assessments	Water conservation – turf selection, irrigation systems and controls, landscape assessment and design Water recycling Stormwater reuse Stormwater quality – wetland development, maintenance of landscaped stormwater treatment measures	Staff education and information – herbicide, pesticide and fertiliser use Planning controls – landscape design referrals Education and information – sustainable gardening, waterway health Community groups
Asset Planning	Design and construction of drainage works and road reconstruction Management of Council capital works program Administration of asset protection permits	Stormwater quality – design and construction of stormwater treatment measures	Construction and contractor management

Source: adapted from Moreland City Council 2009, *Integrated Water Management Plan 2009/10 - 2012*.

Box 4.2: Working with external stakeholders

In 2009, Moonee Valley City Council, City West Water and Racing Victoria implemented a stormwater harvesting program at Moonee Valley Racing Club. Stormwater was captured from the grounds, buildings and some surrounding streets and collected in a racecourse dam. The water was then treated and used to irrigate the racetrack.

Source: Moonee Valley City Council, 2010 and City West Water, 2010, *Showerhead Swap on Course at Moonee Valley Racing Club*, 21 July 2010.

4.3 Opportunities for non-council land

The level of control or influence council have in this area will vary depending on the nature of the water management issues and the potential WSUD solutions. Opportunities on non-council land could be delivered through a range of partnerships, incentives and planning controls, which are briefly discussed below. Education and enforcement are discussed in Sections 4.4 and 4.5.

Building community partnerships

Council may also build partnerships with local businesses and community to minimise their impact on the urban water cycle. Through these partnerships, a council can provide appropriate resources, guidance and funding to develop and implement WSUD in the local community and therefore help to minimise impacts on the local environment.

A key step is to engage business and the community, and help them to appreciate the impact that stormwater and water use is having on the local environment, creeks and bays. Through this engagement, a sense of ownership in WSUD and urban stormwater management can be created.

For further information on Engagement, please refer to Section 8.

There are also opportunities for the implementation of WSUD and water management initiatives on non-council land.

Using incentives

Incentives can provide additional support for businesses and the community to implement WSUD. Incentives may be financial or non-financial in nature and include direct financial support, co-funding arrangements, and provision of drought tolerant plants or rate reductions for water efficient initiatives.

Examples of incentives that have been proposed by councils for WSUD are shown below:

- City of Melbourne have proposed to increase the uptake rate of rainwater tanks on private commercial properties to 50 times the current uptake/installation rate a year (increase to 300 tanks per year). This will be done through a combination of education, incentive and regulatory measures.[2]
- City of Port Phillip is considering additional strategies to accelerate community uptake of WSUD, including incentives within the planning and approvals sector, bulk purchase schemes for rainwater tanks, additional outreach programs, and rebate programs.[3]
- Knox City Council plans to develop incentives to promote WSUD systems to the community and to developers and builders.[4]

Planning controls

A council is responsible for local land use planning and has a range of responsibilities under the *Planning and Environment Act 1987*. A planning scheme manages land use and development in a municipality. The relationship between the state and local planning provisions is shown in Figure 4.1.

Figure 4.1: The Victorian planning scheme

State Section (standard to all Victorian Planning Schemes)	**Local Section** (specific to a municipality)	
State Planning Policy Framework	**Local Planning Policy Framework**	
	Municipal Strategic Statement (MSS)	Local Policies (Clause 22)
Victorian Planning Provisions (VPP) › Standard zones, overlays and provisions	*Local Planning Provisions (LPP)* › Schedules to the zones, overlays and some additional provisions	

2 City of Melbourne 2009, *City as a Catchment Strategy*, p. 47.

3 City of Port Phillip 2010, *Water Plan*, p. 36.

4 Knox City Council 2010, *Water Sensitive Urban Design and Stormwater Management Strategy 2010*, p. 21.

A key provision relating to WSUD in the *Victoria Planning Provisions* is Clause 56 that requires that most subdivisions in residential zones meet integrated water management objectives relating to:[5]

- 56.07-1 Drinking water supply objectives and Standard C22
- 56.07-2 Reused and recycled water objective and Standard C23
- 56.07-3 Waste water management objective and Standard C24
- 56.07-4 Urban run-off management objectives and Standard C25.

However, Clause 56 does not apply to existing and small-scale developments that do not trigger the need for a subdivision permit.[5] In response, some councils have sought to implement new WSUD planning controls through an amendment to a council planning scheme. These controls could include additional policy statements in the Municipal Strategic Statement (MSS), a new local planning policy, and/or WSUD overlays.

Bayside City Council was the first council in Victoria to introduce a planning scheme amendment for WSUD. The amendment came into effect on 4 June 2009 following approval by the Minister for Planning after more than four years of development and testing[6] (see Box 4.4).

As part of the Inner Melbourne Action Plan (IMAP), the Cities of Melbourne, Port Phillip, Stonnington and Yarra have also developed a common stormwater management (WSUD) revision of their local planning policy and accompanying WSUD Guidelines, through individual amendments of their respective planning schemes. The WSUD policy will apply to new buildings, extensions to buildings (50 square metres in floor area or greater), and subdivisions in a business zone. At the end of December 2010, all four councils had adopted their respective amendement and the adopted document had been lodged with the Minister for Planning for approval.

In May 2010, Hume City Council agreed to seek authorisation from the Minister for Planning to prepare and exhibit Amendment C138 to implement the Hume Industrial Stormwater Code of Practice into the Hume Planning Scheme in accordance with Section 8A(3) of the *Planning and Environment Act 1987*.[7] Knox City Council has also identified that it will investigate new planning controls in its WSUD strategy.[8]

A council can strongly influence new developments in the strategic planning phase with preparation of precinct structure plans. It is important that the implementation of WSUD is considered at this stage, as the implementation of Clause 56 may be constrained otherwise.

Box 4.4: Bayside Planning Scheme Amendment C44

Through Planning Scheme Amendment C44, Bayside City Council introduced a new local policy that establishes statutory requirements for the incorporation of WSUD in new developments and implements the WSUD objectives and strategies of the MSS.

The new policy establishes a 100% overall and 65% minimum compliance with the stormwater quality requirements for development. Developments will be assessed using the MUSIC assessment tool, or equivalent to determine compliance. When 100% compliance cannot be achieved, an 'off-set' measure will be available to make up that portion of compliance above 65% not achieved on-site. Applications that do not achieve the minimum 65% on-site requirement will be refused. The Amendment incorporates three technical documents into the Bayside Planning Scheme to assist in the implementation of the local policy:

- Urban Stormwater Best Practice Environmental Management Guidelines, Victorian Stormwater Committee, CSIRO Publishing, 1999
- Australian Runoff Quality (draft 2003), Institution of Engineers, Australia, 2003, and
- WSUD Engineering Procedures: Stormwater, EPA, 2004.

Source: Bayside City Council 2010, *Planning Scheme Amendment* C44.

Assessing opportunities on council land:

- Analyse capital works programs, and capital and operational budgets, to identify opportunities to integrate WSUD to departmental budgets, programs and projects.
- Identify opportunities for implementation of WSUD to establish as a baseline to quantify achievable targets.

5 Department of Sustainability and Environment 2006, *Using the integrated water management provisions of Clause 56 – Residential subdivision*. The requirements of Clause 56.07 apply in a Residential 1, Residential 2, Residential 3, Mixed Use and Township Zone and any Comprehensive Development Zone or Priority Development Zone that provides for residential development. They do not apply to the subdivision of land into lots each containing an existing dwelling or car parking space. All subdivisions, excluding subdivisions of existing buildings and car parking spaces, in these zones must meet the integrated water management objectives.

6 Bayside City Council 2010, *Planning Scheme Amendment C44*.

7 Hume City Council 2010, Ordinary Council Meeting, 31 May 2010.

8 Knox City Council 2010, *Water Sensitive Urban Design and Stormwater Management Strategy 2010*, p. 25.

In 2009, regional WSUD guidelines were prepared to assist a council set out expectations for WSUD projects within a municipality to inform developers and consultants. The document provides information on the approvals process, design considerations, suitability of WSUD types in different conditions and considerations for construction, protection, maintenance and handover of WSUD assets. The regional WSUD guidelines were originally developed by Melbourne Water and Baw Baw Shire, and subsequently Bass Coast, Cardinia, Mornington Peninsula and South Gippsland Shire Councils.[9]

4.4 Education and encouragement

A council could establish a range of education programs and engage with business and the community to promote WSUD on non-council land. Through education and encouragement council may be able to work with business and local communities to implement WSUD, reduce water consumption, and reduce impacts on local waterways.

Education on WSUD implementation targets can be undertaken through various approaches, such as brochures, displays, demonstration projects, events, and interpretive signage.

Electronic education will become increasingly important and innovative approaches will be able to be used. The City of Port Phillip *Environment E-hub* is council's primary household online education tool, to complement the materials and approach of council' behaviour change programs, while reaching out to a larger section of the community.[10]

4.5 Enforcement

Enforcement is part of a suite of measures including planning, education and incentives to deliver on WSUD implementation targets. Targeted enforcement of WSUD controls can help to protect waterways and bays, and hold individuals, businesses, and other organisations accountable for their actions. Enforcement can also support and encourage good WSUD practice.

In terms of enforcement to support WSUD implementation targets, there may be opportunities to:

- enhance monitoring and enforcement of building and construction sites and practices, such as stormwater management;
- improve management and enforcement of litter and waste management controls; and
- use a combination of enforcement and education to target hotspot areas, such as proposed by Knox City Council.

4.6 Risk assessment

Risk assessment is an important factor in planning for and establishing WSUD projects, it can also support the development of WSUD implementation targets. Risks with establishing WSUD implementation targets within a Water Plan or WSUD Strategy could be considered in terms of: public health; safety; costs; carbon intensity; and new technology; and other factors. Risks could be categorised into financial, environmental and human health risks.

Further information on risk assessment can be found in Module 6.2 of the *Model WSUD Guidelines* (Melbourne Water and City of Melbourne 2009); and in the *WSUD Risk Management Guidelines*.

4.7 Selected resources

Selected resources on opportunities for WSUD implementation include:

- Melbourne Water, *Water Sensitive Urban Design Brochure*, Melbourne Water and Knox City Council, available at: http://www.melbournewater.com/content/library/wsud/mw_wsud_brochure.pdf
- Melbourne Water and City of Melbourne 2009, *WSUD Guidelines, Applying the Model WSUD Guidelines*, available at: http://www.melbourne.vic.gov.au/Environment/SavingWater/Documents/WSUD_Guidelines.PDF
- City of Port Phillip 2010, *Water Plan, Toward a Water Sensitive City*, available at: http://www.portphillip.vic.gov.au/Report_5_-_Attachment_1_-_Final_Water_Plan_Full_Version.pdf
- Botany Bay Coastal Catchments Initiative 2007, *Barriers and Opportunities to WSUD Adoption in the Botany Bay Catchment*, available at: http://www.sydney.cma.nsw.gov.au/bbcci/publications/BBCCI_WSUD_Barriers_and_Opportunities_to_WSUD_Adoption_FinalV3.pdf

9 WSUD Guidelines, 2009, see: http://www.bawbawshire.vic.gov.au/Files/WSUD_Guidelines_Jan2009.pdf

10 City of Port Phillip 2010, *Water Plan, Toward a Water Sensitive City*, p. 64.

5 Setting Objectives and Establishing WSUD Implementation Targets

Key Points

Sound policy development will assist council in developing, documenting and communicating what it wants to achieve with regard to water management and river health, and how and when it wants to achieve WSUD implementation targets and related actions and initiatives.

Setting WSUD implementation targets is essential to achieve progress in delivering on and meeting council's WSUD objectives and goals.

Adopting well-designed WSUD implementation targets will strengthen strategic WSUD decision-making and embed WSUD within council and across departments.

Considering different investment scenarios for implementation on council (and potentially non-council land) will allow council to set realistic and achievable WSUD implementation targets.

5.1 Introduction

Robust water objectives provide a clear focus and direction for council's water management. WSUD implementation targets can be monitored and reported to support the tracking of progress towards council's long term water goals, drive further action and strengthen commitment.

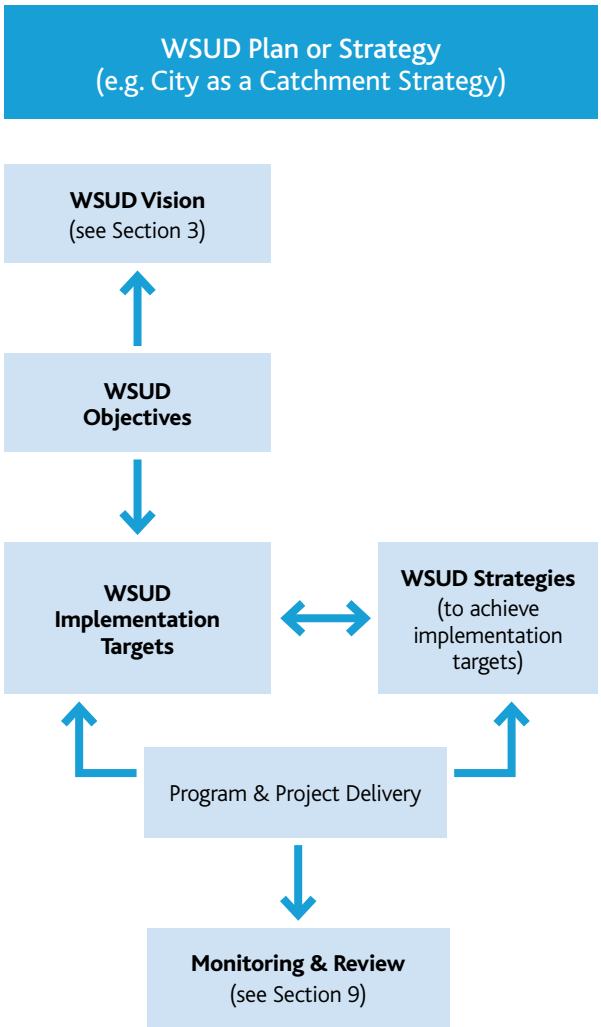
This section introduces key elements of effective policy development to support the setting of water objectives and WSUD implementation targets. It considers how to model scenarios and costs, and implications for capital works budgets.

Broadly, the development of WSUD implementation targets involves:

- using a water balance to identify water and pollutant flows (see Section 2);
- reviewing the strategic context and council's existing water policies (see Section 3);
- understanding council water management, stormwater and river health opportunities and priorities (see Section 4); and
- establishing relevant water objectives and WSUD implementation targets within a broader strategic framework, such as a WSUD strategy, a "City as a Catchment Strategy", or a Water Plan.

Figure 5.1 outlines a general framework with water objectives and WSUD implementation targets positioned within a WSUD plan or strategy, such as a "City as a Catchment Strategy". Council's vision for water management (see Section 3) will inform the setting of objectives and implementation targets.

Figure 5.1: Framework for the development of water objectives and WSUD implementation targets



Box 5.1: Outlines of selected WSUD strategies and plans with WSUD implementation targets

Melbourne City Council

City as a Catchment Strategy 2009

1. Introduction
2. Background
3. The basis for city as a catchment
4. Framework for a 'water sensitive city': a strategy for resilience (including purpose and fundamental attributes)
5. City of Melbourne: a 'water sensitive city' (including water budget, alternative water source hierarchy, pollutant budget, and water cycle management targets)
6. Current status of sustainable water management practices
7. Developing a strategy for resilience (including implementation hierarchy and action plan)

Appendices

Port Phillip City Council

Water Plan 2010

1. Introduction (including aims and objectives)
2. Our current approach to water management (including water and pollutant balance)
3. Our integrated water management strategy (including vision, principles of IWM, IWM targets, strategies for IWM, and water management hierarchy)
4. Taking action (including action plan)

Appendices

Knox City Council

WSUD and Stormwater Management Strategy 2010

1. Introduction (including purpose, aims and vision)
2. Background
3. Prioritisation of WSUD activities in the municipality
4. Maintenance of WSUD systems
5. Continue building a WSUD culture within Council
6. WSUD implementation framework (including objectives, WSUD Program Targets and WSUD Implementation Targets)

Appendices

Box 5.1 provides outlines of the structure of selected council water strategies and plans covering vision, purpose, objectives, WSUD implementation targets and strategies. A council will need to choose which structure best frames and supports their water objectives and WSUD implementation targets.

5.2 Setting water objectives

Sound policy and plan development is essential to formulating robust water objectives and WSUD implementation targets, and informing council's WSUD planning, project and decision-making processes. Policy development helps translate council's vision for water management into WSUD implementation targets and action. Background information on the policy process, and the critical steps involved, are outlined in Appendix A5.1.

A series of high level water objectives will help frame WSUD implementation targets

It is important at the outset to consider the timeframe within which council wants to achieve its long term goals for river health, and for other aspects of water management, such as reducing water consumption, developing alternative water sources, and water reuse.

A council could develop its water objectives and WSUD implementation targets based around:

- stormwater: what can be done to reduce pollutant loads and/or connection of impervious areas to waterways, achieve concentration targets, reduce peak stormwater flows, duration, frequency and volumes, and improve water quality?
- water saving (reduction of potable water consumption): what can be achieved in terms of demand reduction and water efficiency?
- alternative water use: what alternative sources of water are available to reduce reliance on drinking water?
- wastewater reduction: what can be achieved in terms of wastewater reuse and recycling?, and
- groundwater quality and quantity: how can groundwater management be improved?

It should be noted that there are strong links between these different objectives. For example, using stormwater as an alternative water source will reduce negative environmental impacts on streams, rivers and the bays.

Water objectives should be clear, and be specified broadly enough to allow consideration of relevant WSUD strategies and actions that support the achievement of WSUD implementation targets. Examples of WSUD policy objectives from the Knox City Council *WSUD and Stormwater Management Strategy* (2010) are shown in Box 5.2.

Box 5.2: Example WSUD policy objectives

1. Waterways in 'High Value Catchments' Areas are protected and rehabilitated towards pre-development waterway characteristics (original ecosystem). To be done through the disconnection of directly connected impervious surfaces.
2. Directly connected impervious (DCI) surfaces to waterways are disconnected via appropriate WSUD treatments.
3. WSUD systems are built in locations that maximise their environmental, social and economic benefits to the community.
4. Direct illegal discharge of pollutants into waterways is minimised through education, enforcement & interception systems.
5. WSUD systems are functional by ensuring that they are designed, constructed and maintained correctly and to 'best practice' standards within Knox.

Source: Knox City Council 2010, *Water Sensitive Urban Design & Stormwater Management Strategy 2010*, from table 4, pp.17-19.

Tasks to consider:

› Develop and set high-level water objectives to help frame WSUD implementation targets.

5.3 Setting WSUD implementation targets

A series of high level water objectives will help frame WSUD implementation targets. These targets are a commitment that water goals or objectives, such as for water quality and river health, will be met to an agreed level within a specified timeframe. WSUD implementation targets can be used to measure the success of a WSUD program or activity. A test for the suitability of WSUD implementation targets is outlined in Box 5.3.

WSUD implementation targets can be quantitative and qualitative, and may be set for the short, medium or long term. Council could consider municipal or catchment-wide issues with respect to stormwater management, wastewater management and water resource management. There may also be an opportunity to work with other councils in achieving WSUD implementation targets at the regional or catchment scale.

Council may find it useful to set different targets for council and the community as councils usually only have indirect influence on community action. Mechanisms to drive implementation of WSUD in the community or in council will be very different. For example, council may set council and community targets for the percentage of water needs sourced from alternative water sources by 2020. Council has direct influence on how it will seek to drive and achieve such a target on council land, and can implement direct initiatives, such as the installation of rainwater tanks and greywater reuse systems. Council may seek to undertake partnerships, education initiatives, and provide information on the benefits of alternative water sources and technologies, or implement more regulatory planning controls (see Section 4).

Box 5.3: SMART Test for WSUD Implementation Targets

Specific	Clear and concise to avoid misinterpretation of what is to be achieved.
Measurable	Can be quantified and results can be compared to other data and show trends if measured over time.
Achievable	Practical, reasonable and credible given available resources and expected conditions.
Relevant	Informative and useful to stakeholders having regard to the context in which the Council operates.
Timed	Specifies a timeframe for achievement and measurement.

Source: adapted from Australian National Audit Office 2007, *Audit Report No. 23 2006-07: Application of the Outcomes and Outputs Framework*, Canberra.

The water and pollutant balance (see Section 2) provides a good basis to set WSUD implementation targets as it quantifies:

- potable water, wastewater and stormwater flows, together with infiltration, evapotranspiration and status of groundwater
- pollutant (suspended solids, phosphorus and nitrogen) load and flows in the urban catchment, for roads, roofs, and other impervious areas and pervious areas

A number of councils (including Melbourne, Port Phillip, Manningham and Yarra City Councils) have set stormwater quality targets as reductions of the pollutant loads generated by the whole municipality, with the long-term objective to achieve best environment management practices objectives[1] (80% for suspended solids, 45% for phosphorus and nitrogen).

When setting WSUD implementation targets, council needs to assess whether the outcomes desired can be achieved and resourced over specific time periods. An analysis of opportunities for implementation of WSUD will help council assess what could potentially be achieved on the ground (see Section 4). This information can then be used to consider different investment scenarios. The level of investment in WSUD both by council and the community will determine WSUD implementation targets timeline. Comparing different investment and implementation scenarios will thus help council to define reasonable and achievable targets.

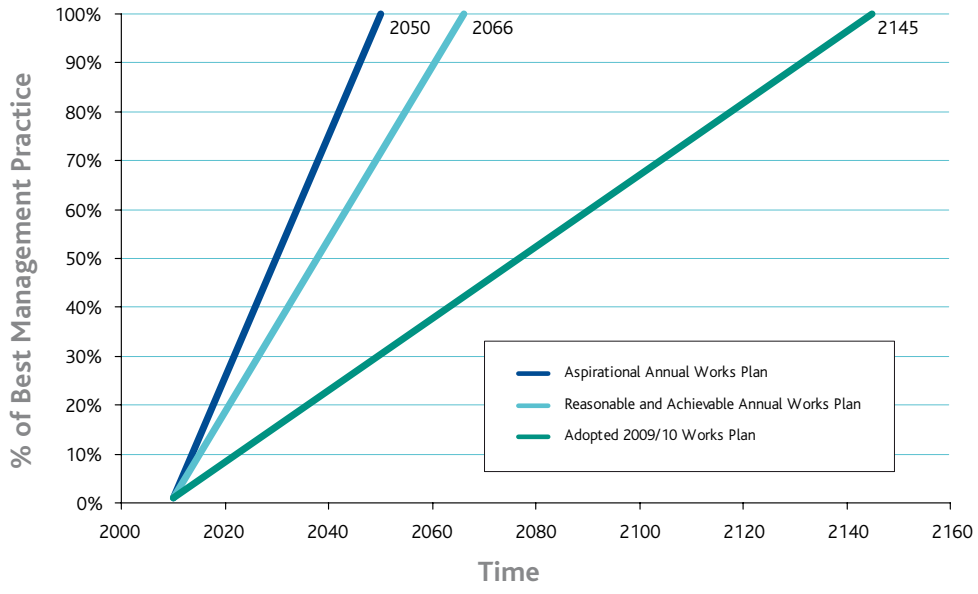
These scenarios may consider:

- different investment rates in capital works program for WSUD by council;
- different adoption rates of rainwater tanks, stormwater harvesting and water recycling by the community (which may be driven in part by investment by council in initiatives on non-council land);
- changing water efficiency requirements, for example, with increased requirements and/or demand for water efficient appliances and buildings;

For example, Port Phillip City Council considered three investment scenarios and timelines to achieve best practice stormwater management targets across the municipality as part of the development of the *Water Plan* (see Figure 5.1) (also see Section 4 – assessing opportunities for implementation). The three investment scenarios were:[2]

- Scenario 1: Adopted 2009/2010 capital works program and current 40% uptake of the Sustainable Design in the Application Planning Process (SDAPP)[3]
- Scenario 2: A reasonable and achievable annual capital works program with increased SDAPP uptake, and
- Scenario 3: An aspirational annual capital works program and implementation of the proposed C78 planning amendment to introduce a local planning policy requiring best practice stormwater treatment for all development applications.

Figure 5.1: City of Port Phillip timelines to achieve best management practice (for Total Nitrogen) based on various investment scenarios



Source: adapted from EDAW 2009, *City of Port Phillip Integrated Water Management Strategy*, p. 50.

This graph is based on pollutant load reduction for Total Nitrogen. As such, 100% of best management practice represents a reduction of 45% in Total Nitrogen load generated by the whole municipality. The same analysis was undertaken for Total Phosphorus and Total Suspended Solids.

Scenario one achieves best practice targets only by 2145. This scenario was assessed as not satisfactory and the analysis showed that further investment of approximately double present levels can reduce attainment of targets to within 60 years. Council subsequently adopted scenario 2, setting a long term goal of achieving best management practices by 2066. Short-term targets (2020) for pollutant load reductions were then set accordingly.

Tasks to consider when establishing WSUD implementation targets:

- Compare timeline trajectories of different scenario for investment and implementation by council and the community.

Box 5.6 outlines further considerations when developing WSUD implementation targets.

Box 5.6: Developing WSUD Implementation Targets

The following questions may help councils set WSUD implementation targets:

- What are we trying to achieve? What are our WSUD objectives? What would constitute a successful outcome or set of outcomes?
- Are our WSUD implementation targets consistent with strategic aims and objectives as set out, for example,in the *State Environment Protection Policy (Waters of Victoria) 2003* and *Better Bays and Waterways*?
- Are our WSUD implementation targets defined to reflect outcomes (e.g. improved river health, enhancement of water conservation, better management of water balance etc), or outputs (e.g. installation of retarding basins, number of raingardens built annually)? What will be the focus of particular WSUD programs or projects?
- How will our objectives and WSUD implementation targets be measured?

It may not be possible for council to set some targets, due to insufficient information, tools, expertise or lack of relevance to council's context. This should be documented, and a review process planned so that targets are reviewed and updated as information or expertise becomes available. City of Port Phillip for example described in their Water Plan[4] "what integrated water management targets can't be set at this time", it includes wastewater reduction, groundwater, permeability and stormwater flows.

Tasks to consider with setting WSUD implementation targets:

- Determine what council is trying to achieve, and assess what would constitute a successful outcome or set of outcomes.
- Develop WSUD implementation targets that are consistent with council's strategic aims and water objectives.
- Document what WSUD implementation targets cannot be set at this point in time.

1 Victorian Stormwater Committee, 1999. *Urban Stormwater: Best Practice Environmental Management Guidelines*, ISBN 0 643 06453 2, CSIRO publishing, Collingwood, Australia.

2 EDAW, 2009. *City of Port Phillip Integrated Water Management Strategy*, Melbourne, pp. 49-50.

3 For more information on the SDAPP, visit www.portphillip.vic.gov.au/sdapp.htm

5.4 Examples of WSUD implementation targets

At the time of writing, a number of councils in the Melbourne region had adopted WSUD or stormwater targets:

- Melbourne City Council: Total Watermark – City as Catchment, April 09
- Yarra City Council: Water Quality Improvement Targets, March 2009
- Manningham City Council: Stormwater Targets, September 2009
- Port Phillip City Council: Water Plan, September 2010.
- Knox City Council: WSUD & Stormwater Management Strategy, June 2010.

More details on the WSUD implementation targets adopted by Port Phillip City Council and Knox City Council are provided below.

Port Phillip's approach to WSUD implementation targets involves setting water conservation, stormwater quality and augmentation targets for the entire municipality. An alternative approach can be found with Knox City Council's High-Value Catchments Program approach (see Box 5.5).

Knox City Council's program requires the identification of 'priority catchments' based on an assessment of their current environmental condition. Evidence suggests that there is a positive correlation between directly connected impervious (DCI) areas (i.e. impervious areas which drain via a pipe or constructed channel to a waterway) and stream health. As such, based on the impervious area in a catchment, Knox City Council has sought to identify those catchments (or streams) of high value (i.e. minimal stormwater degradation).[5]

Further information on DCI is in Section 2.6.

Knox City Council's approach has been developed in recognition of the need to treat upstream catchments differently from downstream catchments. Upstream councils, such as Knox have more intact high value catchments and waterways that could be protected or restored in the short-term with reasonable investment.

Knox City Council has stated that its "primary responsibility should be to protect the values of the waterways in its municipality – in turn this will help to protect and restore downstream waterways."[6] Generally, there is a progressive deterioration of waterways from upstream catchments with low urbanisation to more degraded and highly urbanised downstream and bayside catchments.

A council will need to consider its waterway characteristics to determine whether their WSUD implementation targets approach of stormwater is based solely on pollutant load reduction (similar to Port Phillip city Council), or include specific programs and prioritisation of high value catchment (similar to Knox).

5.5 Future projections

Climate change and population growth will affect council's water balance, and as such it is worth investigating future projections and their impacts.

As part of the development of its *Water Plan*, City of Port Phillip assessed whether stormwater harvesting schemes and rainwater tanks could be affected by climate change with a decrease in rainfall (reducing supply) and an increase in irrigation demands. Modelling of a typical residential household with climate adjusted scenarios identified little change in reliability by 2020, suggesting that rainwater tanks are resilient to short term climate change impacts. This is similar to results modelled for a typical stormwater harvesting scheme, with a decrease in reliability of only 1%-2%.[8]

Moreland City Council considered two future water use scenarios for annual sports field and open space water use volumes to get an indication of projected water prices for Council under conditions with no water restrictions. Scenario 1 used 2007/08 prices and scenario 2 used proposed price increases for 2012/13 derived from Victorian Essential Services Commission draft price determinations.[9]

4 City of Port Phillip, 2010. *Water Plan, Toward a Water Sensitive City*.

5 Knox City Council, 2010. *Water Sensitive Urban Design and Stormwater Management Strategy 2010*, p. 11.

6 Ibid, p. 33.

7 Knox City Council, 2010. *Water Sensitive Urban Design and Stormwater Management Strategy 2010*, pp. 25-26.

8 City of Port Phillip, 2010. *Water Plan, Toward a Water Sensitive City*, pp. 44-45.

9 Moreland City Council, 2009. *Integrated Water Management Plan 2009/10* – 2012, p. 30.

Box 5.4: City of Port Phillip WSUD Implementation Targets[4]

Water conservation
Target description: Absolute and per capita mains water saved (ML and %)

Council targets:	*Community targets:*
› 70% reduction (or 363 ML) by 2020 › 20% reduction of council facility water use based on 2007-08	› 50% reduction in annual residential water use per capita by 2020 › 50% reduction in annual non-residential water use per business by 2020

Stormwater quality improvement

Target description: Improvements in stormwater quality, expressed as reductions in Total Suspended Solids (TSS), Total Phosphorous (TP), and Total Nitrogen (TN) again total pollutant loads generated by the Municipality. The target is expressed as an annual 2020 target.

Best practice stormwater management target

To achieve best practice stormwater management targets for Total Suspended Solids, Nitrogen, Phosphorous and Litter by 2066.

Stormwater targets for 2020 and 2066

Council target for 2020:	*% Annual reduction required:*	*Council target for 2066:*
TSS: 10,973 kg/yr or 19%	1.5-2%	80%
TP: 18 kg/yr or 15% TN: 88 kg/yr or 10%	1.1-1.6% 0.8-1.1%	60% 45%

Alternative water sources

Target description: Increase in the use of alternative water sources in absolute terms (ML) and as a percentage of total water consumption.

Council target: 15% of base year water use of 50% of future council irrigation demand.

Note: IWM targets have not been set for wastewater, groundwater and permeability as at this point there is either insufficient data, tools or expertise to determine targets or measure progress in these areas.

Box 5.5: Knox City Council WSUD Implementation Targets[7]

WSUD PROGRAM TARGETS

Program	Target
High-value catchments	› Reduce directly connected impervious (DCI) surfaces in Dobsons creek catchment to less than 1% › Reduce DCI surfaces in Blind Creek (East) catchment to less than 1% › Reduce DCI surfaces in Ferny Creek (East) catchment to less than 2% › Reduce DCI surfaces in Monbulk Creek catchment to less than 2%
Hotspots	Reduce number of hotspot pollution areas to less than 5 sites
Opportunistic	Include WSUD systems into all Capital Works Programs where applicable
Planning	There is appropriate regulatory power and structure to enforce on and educate the community to construct WSUD systems and to understand their effect on waterways
Maintenance	All WSUD sites constructed by Knox City Council are maintained to best practice standards
Monitoring & reporting	Council aware of impact actions strategy on municipality

Box 5.5: Knox City Council WSUD Implementation Targets *continued*

Modelled Performance of Individual WSUD Projects

Parameter	**Current Best Practice Performance Objective**
Suspended Solids (SS) load	80% retention of the typical urban annual load
Total Phosphorous (TP) load	45% retention of the typical urban annual load
Total Nitrogen (TN) load	45% retention of the typical urban annual load
Litter	70% retention of the typical urban annual load
Flows › Frequency of runoff above natural level (days/year) › Volume of runoff per year › Volume infiltrated per year	 No increase in frequency from pre-developed No Increase in pre-developed volume Volume equivalent to pre-developed
Potable water savings (kL/year)	Site- or project-specific targets to be used
Construction Phase:	
Suspended Solids (SS)	Effective treatment of 90% of daily run-off events
Litter	Prevent litter from entering the stormwater system
Other Pollutants	Limit the application, generation and migration of toxic substance to the maximum extent possible

Reduction in Directly Connected Imperviousness (DCI)

Type of waterway	**Knox City Council's 5 years target DCI**	**Knox City Council's 50 years target DCI**
Natural grassland woodlands	<1%	<0.5%
Rural waterways	<1%	<0.5%
Urban growth	<2%	<0.5%
Existing urban (With DCI <10%)	<2%	<0.5%
Existing urban (With DCI 10-20%)	<3%	<0.5%
Existing urban (With DCI 20-30%)	<5%	<0.5%
Existing urban (With DCI >30%)		<0.5%

Waterway Health Targets: identified but monitoring is beyond the scope and resources of Council.

6 Capacity to Deliver WSUD Implementation Targets

Key Points

Assessing capacity will help position a council to deliver on WSUD implementation targets and achieve progress.

Designing a capacity building program will support council staff and associated contractors and other stakeholders to further develop WSUD skills and expertise.

A range of organisations, such as Clearwater, can provide capacity building assistance with training and expert guidance, and a range of guidelines and manuals are available to support building WSUD capacity.

6.1 Introduction

As part of setting WSUD implementation targets (see Section 5), it will be important for a council to assess its capacity to deliver WSUD. A council may draw on the results of capacity assessments, such as the Melbourne Water needs analysis, and use various WSUD tools and guidelines to enhance capacity, and improve governance structures and processes. A council may also consider what external support is available, such as WSUD working groups, training organisations, and potential linkages to other WSUD initiatives and programs.

This section:

- provides guidance on how a council could assess its capacity to deliver WSUD;
- outlines how to design a capacity building program to support delivery of WSUD implementation targets;
- identifies key capacity building actions and initiatives; and
- available support and other WSUD initiatives.

6.2 Assessing capacity to deliver WSUD implementation targets

Capacity will influence the ability of council to consider, understand, develop, adopt and implement WSUD planning and actions to achieve WSUD implementation targets. Important institutional capacity aspects for WSUD include:[1]

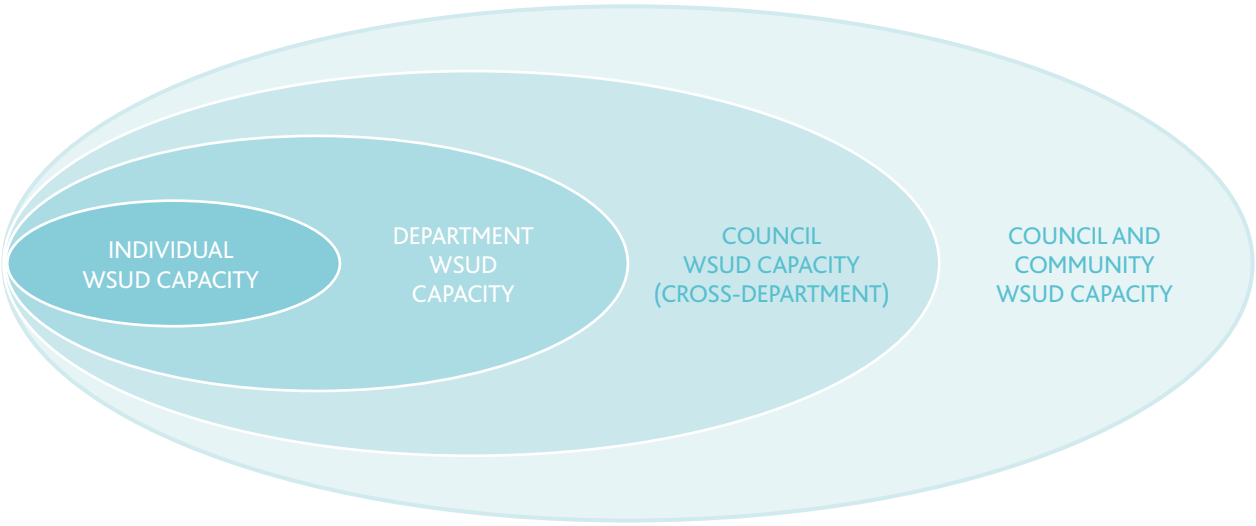
- Human resources: the technical and 'people' knowledge, skills and expertise available within a region to promote WSUD.
- Intra-organisational capacity: the key processes, systems, cultures and resources within organisations to promote WSUD.
- Inter-organisational capacity: the agreements, relationships and consultative networks that exist between organisations to allow them to cooperatively promote WSUD.
- External institutional rules and incentives: the regulations, policies and incentive schemes that work to encourage WSUD in a given region.

Council's WSUD capacity can be considered at various levels (see Figure 6.1). A council may start with one or two individuals who are skilled and interested in WSUD. However, over time, and with appropriate support, this capacity can expand across all relevant council departments and out into the community.

Assessing capacity will help a council deliver on WSUD implementation targets.

1 Brown, R.R, Taylor A. and Mouritz, M. 2006, Institutional Capacity and Policy, In Wong, T. (Ed), *Australian Runoff Quality: A Guide to Water Sensitive Urban Design*, Engineers Australia, Canberra.

Figure 6.1: Levels of Capacity to Deliver WSUD Implementation Targets



Source: adapted from Brown, R.R, Taylor A. and Mouritz, M. 2006, "Institutional Capacity and Policy", In Wong, T. (Ed), *Australian Runoff Quality: A Guide to Water Sensitive Urban Design,* Engineers Australia, Canberra.

Several tools could be used by a council to assess capacity to deliver WSUD implementation targets including a SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis, and the Melbourne Water *Needs Analysis*.

SWOT Analysis Tool

A SWOT analysis could be used as one approach to assess existing capacity. A SWOT analysis allows a council to identify and maximise their strengths and opportunities, while accounting for and mitigating their weaknesses and threats.

A SWOT analysis could be undertaken in a workshop with key WSUD stakeholders from across council. Within this workshop, a facilitator could ask a number of relevant questions about strengths, weaknesses, opportunities and threats regarding WSUD knowledge building, professional development, organisational strengthening, directive reforms and facilitative reforms (see Box 6.2 for explanation of these terms).[2]

An example summary SWOT analysis of WSUD capacity is outlined in Box 6.1. More detail would be required on specific points to inform the analysis and potential responses.

Box 6.1: Example Summary SWOT Analysis of WSUD Capacity

Strengths

- Significant officer awareness of WSUD
- Strong focus on drought proofing and adapting to climate change

Weaknesses

- Low executive commitment
- Limited resources
- No planning instruments

Opportunities

- Incorporate WSUD in Council works
- Promote leadership
- Undertake capacity building
- Seek external funding

Threats

- Limited internal commitment
- Insufficient maintenance
- Poor asset management knowledge

Source: adapted from Botany Bay Coastal Catchments Initiative 2007, *Barriers and Opportunities to WSUD Adoption in the Botany Bay Catchment.*

2 See: Brown, R.R, Taylor A. and Mouritz, M. 2006, "Institutional Capacity and Policy", In Wong, T. (Ed), *Australian Runoff Quality: A Guide to Water Sensitive Urban Design*, Engineers Australia, Canberra.

Melbourne Water Needs Analysis

The Needs Analysis is a local government self-assessment survey and workshop which aims to:

- assist councils in understanding its ability to plan for and implement WSUD;
- provide councils the opportunity to guide Melbourne Water stormwater programs;
- help council to define where it wants to focus its effort in stormwater management[3]; and as a result
- help to direct Melbourne Water's funding and support where it is most beneficial.

The first Needs Analysis was undertaken in 06/07 as part of local government partnership with Melbourne Water to improve the management of stormwater. Another one was underway at the time of writing (09/10).

Actions to assess council capacity:

- Assess council capacity to deliver WSUD implementation targets.
- Engage with other councils when assessing capacity and learn from their experiences.
- Contact Melbourne Water for information on the *Needs Analysis*.

6.3 Designing a capacity building program

A council's existing WSUD capacity can be supported by investment in knowledge and resources, including developing a strong knowledge base with information and research, both technical and non-technical, such as behaviour change. It could be further supported by documenting lessons learnt from WSUD projects both within council and from external sources. A range of capacity building interventions related to WSUD are outlined in Box 6.2.

Box 6.2: Capacity Building Interventions

Brown *et al* (2006) identify five types of capacity building interventions that can facilitate the implementation of WSUD and urban water management.

Knowledge building – improving individuals' and council's awareness and understanding of WSUD, including both technical and non-technical information. This enables continual learning and empowers employees to seek new technology and innovation.

Professional development – requires building individuals' understanding, skills and access to information that enables them to perform more effectively. This includes industry seminars and conferences and identifying and acting on training needs of individuals in relation to WSUD.

Organisational strengthening – involves the review and improvement of management structures, processes and procedures, to build a strong commitment to WSUD at an Executive level.

Directive reforms – formal regulative initiatives that place requirements of WSUD in council's activities, such as clear policy statements and design guidelines.

Facilitative reforms – use financial incentives to achieve the desire result. This requires establishing financial resources to provide organisational incentives.

Source: Brown, R.R, Taylor A. and Mouritz, M. 2006, "Institutional Capacity and Policy", In Wong, T. (Ed), *Australian Runoff Quality: A Guide to Water Sensitive Urban Design*, Engineers Australia, Canberra.

3 Bolton, A., Edwards, P., Lloyd, S. and Lamshed, S. 2007, "Needs analysis: an assessment tool to strengthen local government delivery of water sensitive urban design", in *Proc. 13th Int. Rainwater Catchment Systems Conf. and 5th Int. Water Sensitive Urban Design Conference*, Sydney, Australia, 21-23 August 2007.

A capacity building program could be built around the five interventions outlined in Box 6.2. Key steps in designing the capacity building program would involve:

- establishing the program goals and target audience;
- designing the capacity building program considering participants current knowledge, skills and needs around WSUD;
  - a training program could be developed around WSUD implementation targets and form part of the dissemination and roll out of a WSUD strategy
  - this could provide knowledge transfer on the WSUD vision and implementation targets, and further embed a WSUD culture within council
- delivering the capacity building program to council officers through a range of interactive mechanisms including seminars, workshops, demonstration tours, and formal training modules. These programs can be formal or informal, depending on the audience, and their requirements.

Tasks to consider to develop capacity:

- Consider designing a capacity building program to target priority areas for improving WSUD knowledge, skills, and processes.

6.4 Key capacity building actions and initiatives

Key capacity building actions and initiatives to deliver WSUD implementation targets could include:

- building inter-department relationships and promoting collaboration across council departments;
- providing for information sharing between council departments and with other councils and organisations (e.g. Melbourne Water);
- promoting effective leadership in WSUD and identifying WSUD champions; and
- strengthening community participation and engagement.

Improving relationships, collaboration and information sharing

Improving relationships and promoting collaboration is important between council departments and also with external stakeholders, such as other councils and Melbourne Water. Similar WSUD projects may have already been undertaken, and consequently lessons can be learnt and guidance will be available from others. Potential approaches to promote clear communication and cooperation include:

- inter-department steering committees, technical advisory groups, staff exchange programs and multi-disciplinary project teams;
- jointly developed WSUD strategies, which include a clear vision, objectives, key actions, responsibilities, timeframes, monitoring and reporting mechanisms;
- agreements on funding and responsibilities; and
- incentives for council staff to cooperate and share information, for example, recognition by senior management and awards.[4]

Within each capacity building program, the design should be informative, and seek to engage and empower participants. Moonee Valley City Council, for example, used the construction of a major WSUD raingarden as part of a capacity building program for maintenance and operations staff. City of Port Phillip has established a capacity building program as part of its *Water Plan* (see Box 6.3).

4 Adapted from Brown, R.R, Taylor A. and Mouritz, M. 2006, Institutional Capacity and Policy, In Wong, T. (Ed), *Australian Runoff Quality: A Guide to Water Sensitive Urban Design*, Engineers Australia, Canberra.

Box 6.3: WSUD capacity building, City of Port Phillip

The aim of the City of Port Phillip Capacity Building Program is to ensure that council staff and contractors develop the necessary skills to implement the Water Plan. A Capacity Building Program and calendar of events will support each service unit in the delivery of water management projects. As WSUD is a rapidly evolving field, the capacity building program will be updated regularly.

The Capacity Building program is strongly based on Council's main technical resource, the WSUD Guidelines and on project-based workshops to support project delivery. Clearwater is a key bridging organisation supported by Melbourne Water to provide significant capacity building assistance with its ongoing program of training and resources, providing Council with more technical skills where required.

Source: City of Port Phillip 2010, *Water Plan, Toward a Water Sensitive City*, p. 63.

Box 6.4: Hume City Council – Generating Interest in WSUD

Hume City Council has recently implemented a flagship WSUD project as a part of the Main Street Extension. The project implemented a WSUD treatment train as a part of a lively and vibrant streetscape catering for pedestrians, cyclists and vehicles. Through a community festival and street naming competition, Council used the development to generate interest internally and in the community in environmental sustainable development, including WSUD and urban water management.

Source: Hume City Council, 2010.

Promoting leadership and identifying champions

Identifying and promoting employee interest in WSUD at all council levels can support WSUD projects and build capacity. These employees can be seen as leaders in WSUD and urban water management, and could form the nucleus of a council WSUD steering or working group. The group could meet regularly to discuss WSUD developments, projects and how to achieve WSUD implementation targets.

Identifying WSUD champions within council can also promote opportunities, and play an important role in the implementation of WSUD. These champions will require strong communication skills and the ability to engage internal and external stakeholders to develop and support a WSUD culture. A champion will provide inspiration and motivation, deal with conflict and resistance to change, and empower others to create a sense of ownership.[5]

A flagship project

To build capacity and generate support for WSUD, council may want to consider implementing a flagship project. A flagship project would involve implementation of a significant WSUD project, such as retrofitting a streetscape as a part of capital works renewal or similar. Using local media and other internal communications, a council could generate support and allow other stakeholders to gain an understanding of WSUD through this process (see Box 6.4).

Planning for succession

Another key component to building capacity is retaining sufficient capacity within an organisation. To do this, council should ensure that succession planning is developed and implemented in their policies and practices. This will provide council with a flexible and trained workforce in WSUD that will be able to adapt to changing technology and promote innovation, and retain operational expertise in WSUD. To achieve this, council can implement a number of strategies, including on job training, mentoring, coaching, job rotation, traditional educational programs and formalised feedback processes.[6]

5 Adapted from Taylor, A. 2008. *Leadership in Sustainable Urban Water Management: An Investigation of the Champion Phenomenon within Australian Water Agencies.* Report No. 08/01, National Urban Water Governance Program, Monash University, August 2008.

6 Refer to Water Research Foundation, *Succession Planning for a Vital Workforce in the Information Age*, at http://www.waterresearchfoundation.org/research/TopicsAndProjects/projectProfile.aspx?pn=2850

6.5 Further support and linkages to other initiatives

Linking to other WSUD initiatives

Linking with other WSUD initiatives and seeking support from other organisations can add to capacity building in many ways. Firstly, this support may be expert advice, which can be used to assist council in WSUD or to train and educate council staff through workshops, seminars and demonstration tours.

Linkages could be formed with:

- Other councils – through regional partnerships on WSUD and implementation targets
- Clearwater – builds the skills of water practitioners through delivery of technical training, tours, events, advice and online information:
  - Available at: http://www.clearwater.asn.au/
- Melbourne Water – stormwater program:
  - Available at: http://www.melbournewater.com.au
- ICLEI Oceania – the Water Campaign™ is an international freshwater management program that builds the capacity of local government to reduce water consumption and improve local water quality:
  - Available at: http://www.iclei.org/index.php?id=2384

External facilitation of a capacity building program by WSUD experts through Clearwater, Melbourne Water and other organisations can provide a council with opportunities to network and develop skills in WSUD, while learning from peers and experts in specific WSUD fields.

WSUD guidelines and best practice

There is an increasing range of WSUD guidelines and best practice documentation. These *Guidelines for Developing a Strategic Approach to WSUD Implementation* are intended to reinforce and support other technical and best practice guidelines.

Selected resources include:

- *Urban Stormwater Best Practice Environmental Management Guidelines* (1999)
  - Available at: http://www.publish.csiro.au/nid/220/issue/3822.htm
- *WSUD Engineering Procedures: Stormwater* (2006)
  - Available at: http://www.publish.csiro.au/pid/4974.htm
- *WSUD Guidelines, Applying the Model WSUD Guidelines*, Melbourne Water and City of Melbourne (2009):
  - Available at: http://www.melbourne.vic.gov.au/Environment/SavingWater/Pages/Watersensitivedesign.aspx
- *Evaluating Options for Water Sensitive Urban Design – A National Guide, Joint Steering Committee for Water Sensitive Cities*, Canberra (2009):
  - Available at: http://www.environment.gov.au/water/publications/urban/water-sensitive-design-national-guide.html
- *South East Queensland Healthy Waterways*: resources and information on healthy waterways:
  - Available at: http://www.healthywaterways.org/Home.aspx

6.6 Selected capacity building resources

Brown, R.R, Taylor A. and Mouritz, M. 2006, "Institutional Capacity and Policy", In Wong, T. (Ed), *Australian Runoff Quality: A Guide to Water Sensitive Urban Design*, Engineers Australia, Canberra, available at: http://www.clearwater.asn.au/content/australian-runoff-quality-guide-water-sensitive-urban-design

Taylor, A. 2008, *Leadership in Sustainable Urban Water Management: An Investigation of the Champion Phenomenon within Australian Water Agencies*. Report No. 08/01, National Urban Water Governance Program, Monash University, August 2008, available at: http://www.andretaylor.com.au/resources/

Rapid assessment and action plan tool: Andre Taylor has prepared a suite of tools to be used by council officers to conduct a rapid assessment of their organisation's Institutional Capacity, available at: http://www.wsud.org/tools-resources/rapid-assessment-tool/

Rural Industries Research and Development Corporation 2007, *Capacity Building Resource Manual,* RIRDC Publication number 07/102, available at: https://rirdc.infoservices.com.au/downloads/07-102.pdf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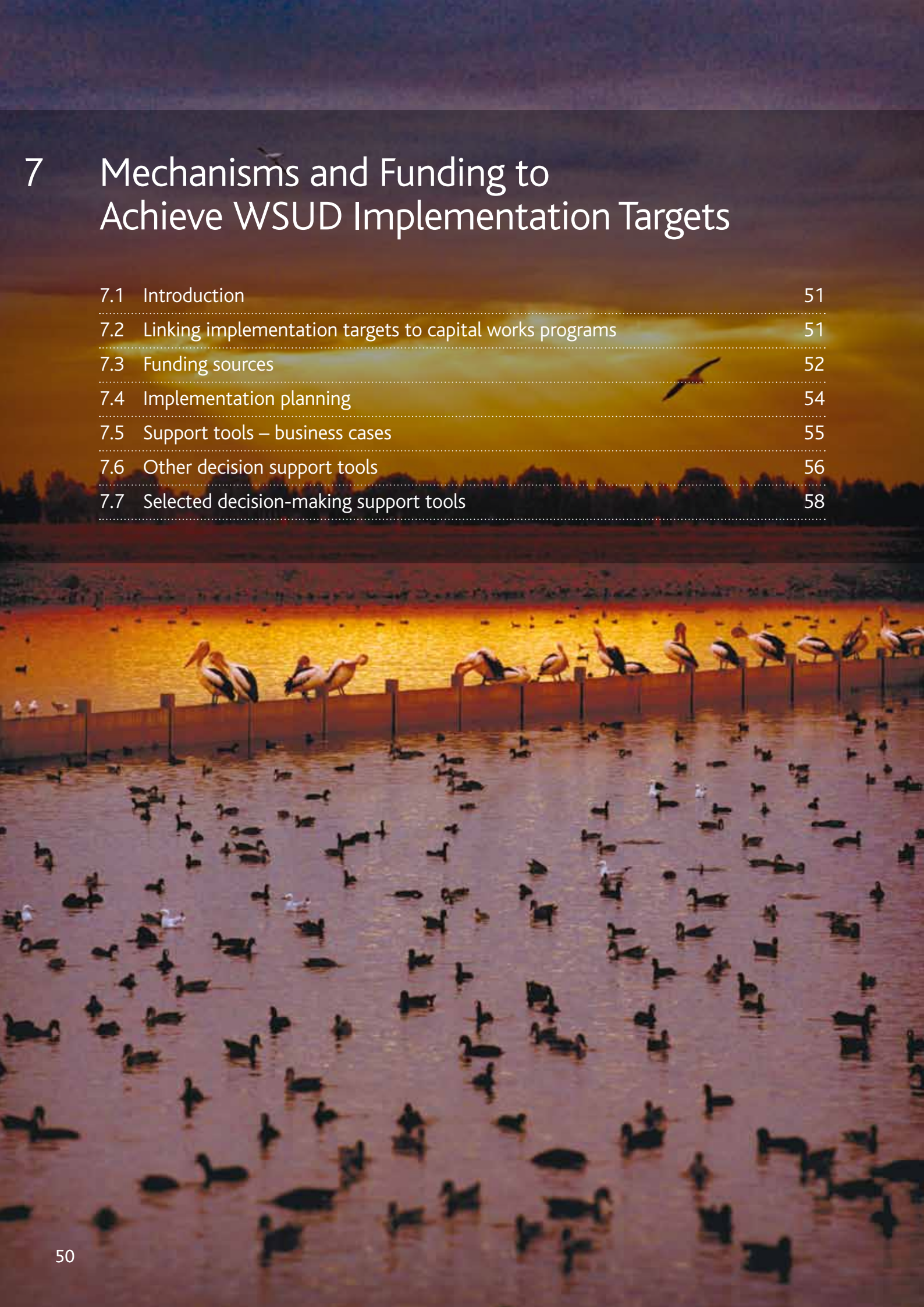
7 Mechanisms and Funding to Achieve WSUD Implementation Targets



Key Points

It is important for a council to embed WSUD implementation targets in its capital works program budgeting and planning.

Decision support tools, such as business cases, cost-benefit and multi-criteria analysis, can provide significant benefit and assistance to a council in linking WSUD implementation targets to its capital works program.

A range of public and private organisations may provide support and additional funding for council WSUD projects.

7.1 Introduction

A reliable funding stream, clear processes and responsibilities will be required to implement WSUD projects and achieve WSUD implementation targets. This section discusses potential ways to:

- embed WSUD implementation targets in a council's capital works program budgeting and planning;
- promote accountability and ownership of WSUD implementation targets within council departments to ensure overall targets are achieved;
- establish funding allocations for WSUD projects; and
- use key decision support tools, including business cases and multi-criteria analysis.

7.2 Linking implementation targets to capital works programs

In the discussion below, council's capital works program refers to the portfolio of capital projects that have been adopted and formally approved by council to meet the social, economic, environmental and infrastructure needs of the community. Capital works improve, upgrade and maintain roads, footpaths, drains, transport and local infrastructure.

There are many opportunities to integrate WSUD into existing capital works programs and projects (see Section 4). For example, WSUD could be incorporated into major council projects that upgrade existing roads, footpaths and drainage, or the construction of new council buildings or rehabilitation of existing ones, such as community centres and sporting facilities. This can support WSUD goals and help reduce overall costs. For instance, constructing curb-side raingardens during the upgrade of an existing road is likely to be more cost-effective than constructing the raingardens in isolation.

Integrating WSUD initiatives within typical capital works projects often presents a change from how capital works projects have been "traditionally" designed and delivered, and as result, it may be met with a level of cultural resistance. Effective communication, engagement and coordination with other capital works projects teams within council will be critical to the success of the integration of WSUD initiatives with traditional capital works projects.

Refer to Section 8 for guidance on stakeholder engagement.

Increasing the focus on WSUD as a capital works priority relative to existing capital works projects requires the strategic engagement of relevant council executives and management committees. It requires placing WSUD on the agenda of relevant council committees, and demonstrating a real business (or service) need for WSUD, and the associated economic, social and environmental benefits and costs. A detailed and robust business case is essential to establishing a distinct WSUD capital works budget.

Refer to Section 7.5 for further discussion on the benefits and how to develop a robust WSUD business case.

WSUD could be incorporated into council's existing major roadworks, infrastructure and drainage projects.

Linking WSUD implementation targets to a council's capital works program is crucial to gain and secure long term funding for WSUD. There are two primary approaches to make WSUD an integral part of a capital works program:

- Ensuring that the capital works budgeting process allow for WSUD to be resourced as an integral part of proposed projects.
- Establishing a separate budget for WSUD within council's overall capital works budget.

Relevant advantages and disadvantages of each approach are discussed below.

Delivering on WSUD implementation targets:

- Consider how best to link the achievement of WSUD implementation targets to council's capital works program planning and budgeting.

Integrating WSUD into an existing capital works program

One approach to secure funding is to link WSUD implementation targets to council's capital works program through integrating or embedding the funding of WSUD into the capital works program budgeting process. This means integrating WSUD in the development and assessment of projects at the business case stage so that the investment required progressively becomes part of business as usual.

Assessing and communicating the full range of economic, financial, social and environmental benefits of WSUD will be key to gaining internal support and council's approval.

While no separate budget for WSUD in its capital works program is established, it may be strategic for council to link the adoption of its water management objectives and WSUD implementation targets to the investment required to meet these targets.

WSUD could be linked to the capital works program through the establishment of a separate WSUD capital works budget.

For example, City of Port Phillip's Water Plan[1] outlines the financial implications of the targets adopted with the following statement:

"Council will need to invest an average annual figure of $1.6million, or 5.6% of its present capital works program of $28,450,000, to the implementation of water sensitive urban design across the municipality."

Establishing a distinct WSUD capital works budget

A second approach to secure funding is to link WSUD implementation targets to council's capital works program through the establishment of a separate WSUD capital works budget in council's overall capital works program.

A significant challenge in getting approval for WSUD projects is the lack of a WSUD capital works budget. Having an allocated "pool" of WSUD funding from which to draw from, may be necessary to secure funding for WSUD initiatives.

Council may have to manage competing priorities and increasing demands on a limited capital works program budget. As such, demonstrating how WSUD provides additional and multiple benefits to the community will be important to establish a new, distinct capital works budget.

Doing so can reduce the challenges of securing funding and approval for WSUD initiatives and projects. It would thus help council to start implementing WSUD. However, as it makes WSUD a separate focus of capital works, council will need to ensure that it doesn't hinder its integration as a standard practice in the long-term.

7.3 Funding sources

Council may seek to fund WSUD through a number of sources:

- internal council funding (through a capital works program as discussed in Section 7.2);
- a combination of internal and external funds (through, for example, a strategic partnership with another water agency); and
- external funds for larger or flagship WSUD projects that are beyond council's ability to fund on their own.

1 City of Port Phillip, 2010. *Water Plan, Toward a Water Sensitive City*, p. 68.

There are a range of public and private organisations across different sectors that are actively addressing issues related to water management and may be potential external funding partners for a WSUD project or initiative.

Applying for funding assistance through state and national grant programs is one way to increase the feasibility and business case of a council WSUD initiative (Section 7.5 discusses the role and benefits of business cases in more detail). By demonstrating an ability to leverage funding from an external party, a council may be far more inclined to approve the initiative.

When seeking external public funding partners, a council could consider the following sectors and organisations:

- Local metropolitan partners – these may include Melbourne Water, and one of the three metropolitan retail water businesses.
- Statewide partners – a range of funding opportunities may be available from the Environmental Protection Authority, the Department of Sustainability and Environment, Sustainability Victoria, VicRoads and VicUrban.
- National partners – significant grants programs are available from Australian Government departments and agencies, including the Department of the Environment, Water, Heritage and the Arts, and the National Water Commission.
- Education sector – partnering opportunities may existing with Universities.

A useful starting point when considering potential state and national grant programs is the Business Victoria online resource centre. This resource provides a comprehensive list of state and national grant programs available. Business Victoria can be found at: http://www.business.vic.gov.au.

There are also a range of private sector organisations that may present legitimate future funding opportunities for WSUD projects and initiatives. Key sectors that a council could consider include: property sector; construction sector; wholesale sector; manufacturing sector; and the not for profit sector.

Identifying potential external funding sources, and establishing how they are delivered (e.g. grant funding, partnership funding, or project-specific funding), will help council to prioritise applications for external contributions. It may be beneficial for council to approach a range of organisations in order to better understand how to secure funding contribution and to establish partnerships.

There is a range of useful tools available that can assist councils in accessing funding and resources for WSUD initiatives. An example of a useful resource is outlined in Box 7.1.

Box 7.1: City West Water 2010 Calendar of Grants and Incentives

City West Water's 2010 Calendar of Grants and Incentives is a particularly useful resource that can assist Councils in accessing funding and resources for WSUD initiatives. The Calendar provides a summary of each grant or incentive, including eligibility, requirements, money available (if known) and application dates. The Calendar offers the following sections:

- **Federal Government grants and incentive schemes** – usually larger amounts of money with tight accountability.
- **State Government grants and incentive schemes** – principally incentives are available as tax rebates, however grants for community organisations are also available.
- **Local Government grants and incentive schemes** – principally incentives are available as tax rebates, however grants for community groups are also available.
- **Corporate foundations and support programs** – more of these opportunities are becoming available as corporate culture recognises the importance of supporting community-based environment initiatives.
- **Peak Industry bodies** – programs offered to Peak Industry bodies.
- **Fund listing** – other lists of available funding.

Source: *City West Water, see: http://www.citywestwater.com.au/business/grants_calendar.aspx*

Consider alternative funding options:

- Consider alternative funding options to support council funding and investment.

7.4 Implementation planning

Council will need to embed its vision for water management and its WSUD implementation targets into existing processes (such as capital works program) to ensure that these targets are met. Different mean to do so are discussed below. This should be read in conjunction with section 4 which outlines opportunities for implementation both on council and non-council land.

Linking implementation to council departments and KPIs

Once WSUD implementation targets have been set (see Section 5), council should consider allocating responsibilities for meeting these targets to various departments. This will help ensure that the overall targets are achieved and will further embed WSUD across council.

For example, a council may have set an overall target of reducing council water consumption by 30 percent by 2020. This could be assigned to relevant council departments, such as Open Space (45 percent of the 30 percent overall reduction), Leisure (30 percent of the 30 percent overall reduction), and Facilities (25 percent of the 30 percent overall reduction).

Council officers and managers who are responsible for delivering WSUD could also have the achievement of selected WSUD implementation targets or sub-targets as Key Performance Indicators (KPI's) in individual performance agreements. Potential KPI's could address the number of WSUD projects delivered on time, to budget and that meet specified performance characteristics.

Developing KPIs to measure progress:

› Consider how best to define departmental KPIs to ensure that overall WSUD implementation targets are achieved.

Implementation plans

Dedicated implementation plans may assist a council to deliver WSUD implementation targets. Implementation planning can help determine the various council programs and projects where there might be WSUD opportunities, for example, as part of drainage programs, traffic improvement programs and tree planting programs. It will be useful for council to define what each of the programs can achieve towards the WSUD implementation targets adopted.

City of Port Phillip, for example, will deliver on its integrated water management strategies through four key implementation plans incorporating strategic initiatives and capital and maintenance works. These implementation plans will summarise all actions being undertaken by key service units within council as well as through local and regional partnerships. The four implementation plans are: open space water management plan; streetscape implementation plan; building improvement plan; and community climate action plan. [2]

Facilitating the delivery of WSUD implementation targets

› Consider whether implementations plan should be developed to facilitate the delivery of WSUD implementation targets

Strategic planning

A council should consider how to best utilise its existing strategic planning processes to integrate WSUD and meet its implementation targets.

For example, activities centres structure plans and precinct plans strongly influence council's works, and as such it will important that they reflect council's vision for water management and link to WSUD implementation targets. Activity centres are an important focus of major urban change over the next 30 years. They are a central part of Melbourne 2030[3] and Melbourne @ 5 million[4], which encourages their development to foster more sustainable and vibrant communities.[5]

2 City of Port Phillip 2010, *Water Plan, Toward a Water Sensitive City*, p. 56.

3 State of Victoria, Department of Infrastructure, October 2002. *Melbourne 2030, Planning for sustainable growth*. ISBN 0 7311 8739 3. Melbourne 2030 is a 30 year plan to manage growth and change across metropolitan Melbourne and the surrounding region.

4 Victorian Government, Department of Planning and Community Development, December 2008. *Melbourne 2030: a planning update – Melbourne @ 5 million*. ISBN 978-1-921331-97-8

5 http://www.dpcd.vic.gov.au/planning/plansandpolicies/activity-centres/activity-centres-overview

Box 7.2: Key Objectives of a WSUD Business Case

An effective WSUD business case should fulfil the following key objectives:

- Outline the WSUD business need for Council.
- Provide important background and supporting information to put the proposed WSUD investment into context.
- Describe how the WSUD investment aligns with Council and broader State/National water resource management policy.
- Provide a robust estimate of the whole-of-life costs of the WSUD investment, and its financial benefits to Council (e.g. the WSUD project may result in the deferral of stormwater or wastewater capital expenditure).
- Estimate the environment and social benefits of the WSUD investment.
- Describe the project approach, including the timelines, resources, funding source, procurement strategy and project governance.
- Outline the risks of the proposed WSUD investment, including how they are likely to affect the investment, and outline any mitigation strategies.
- Outline the level of uncertainty surrounding the proposal.
- Provide options (including a do-nothing option) for Council to consider in reaching a conclusion on the WSUD proposal.

Source: Adapted from Department of Treasury and Finance, Investment Lifecycle Guidelines, Melbourne.

While activities centre policy (in the Victorian Planning provisions) sets out the basic principles for future development, councils need to develop structure plans to manage, influence and facilitate changes in activities centres.[6] An activity centre is divided into a number of precincts, with common objectives, land use patterns and development characteristics, to allow for more detailed planning.

In the urban growth zone, councils also have the opportunity to strongly influence new developments so that they integrate WSUD. This is best done at the planning stage through the preparation of precinct structure plans (see section 4) and their integration in the planning scheme. It may be appropriate for parts of the precinct structure plan to be included in the planning scheme as objectives or strategies in the Municipal Strategic Statement, local planning policy, or decision guidelines.[7]

7.5 Support tools – business cases

Councils use business cases to prioritise and budget for capital works projects. A business case is a strategic document that, at its highest level, provides an organisation with the information needed to make a fully informed decision on determining funding for a program or project.[8]

At times, a council may require a business case before a WSUD concept has been fully scoped and designed, which can result in inaccurate costing of the project. Early concept design will inform identification of project costs and benefits, and potentially prevent higher costs at later stages that may affect the ultimate completion of a WSUD project.

A council can use its business case process to embed WSUD by requiring details on WSUD implications of all projects including:

- evidence of the agreed drivers and assumptions underpinning the business need for the WSUD investment
- the preferred option for WSUD delivery and how it meets council's service delivery needs better than other alternatives, and
- identification of the key WSUD issues and recommendations rising from the business case to aid council decision-making.

Box 7.2 outlines the key objectives of an effective WSUD business case.

6 Department of Planning and Community Development, April 2010. *Structure planning for activity centres, Practice Note 58.*

7 Department of Planning and Community Development, June 2008. VPP (Victorian Planning Provisions) Practice Note | Urban Growth Zone.

8 See Department of Treasury and Finance 2008, *Investment Lifecycle Guidelines*, Melbourne.

Benefits of a business case

It is important to view business cases as not just one-off documents to gain council funding, but management tools to improve WSUD service delivery. A business case confirms the business need for a WSUD program or project, and that the proposal can achieve the desired benefits (e.g. improved water quality, amenity etc). A business case also details the proposed WSUD costs, timeframes and risks, in addition to the projects capital and operations specifications.

Benefits of a business case include[9]:

- confirming the WSUD service need, including how it aligns with council's water management objectives (and if possible, how it aligns to current state/national water strategies)
- evaluating the costs and benefits of alternative proposals for meeting an identified WSUD service need (including non-asset solutions)
- clarifying the key assumptions, risks, timeframes and costs on which the WSUD proposal is based
- evaluating project progress by continuously referring back to the business case and benchmarking actual versus planned performance
- tracking and evaluating benefits
- identifying funding sources for the proposal (including council, state, national and industry sources), and
- improving accountability for the proposal and increasing management's ability to monitor whether it achieves set objectives, targets and key outcomes.

It is important to remember that the level of detail needed in a business case will vary depending on the size, risk and complexity of the WSUD proposal. Some issues outlined above will not be relevant to all proposals. However, the completed business case should show that each issue identified has at least been considered.

Further information on how to develop a business case is in Appendix A7.1 along with an outline of a business case structure.

City of Port Phillip is developing an Ecologically Sustainable Development (ESD) toolkit to assist council officers to prepare their business cases for capital works projects, and aims to provide some assistance in the design phase of sustainability features allowing for officers to design for the best environmental outcomes. This toolkit was in development at the time of writing and will be trialled through the 2010/11 business planning cycle. It will be a useful mechanism for assessing projects that emerge from the various implementation plans and capital works planning that support the delivery of targets within Council's Water Plan. It will also ensure that sustainability features that are proposed in the early stages of business planning can be more accurately costed and are therefore less vulnerable once project budgets are approved.[10]

Using business cases:

- Consider how best to integrate WSUD in council's business cases process.

7.6 Other decision support tools

There are a range of decision support tools available to a council to assist in achieving WSUD implementation targets. Support tools, such as cost-benefit analysis and multi-criteria analysis can assist council is selecting preferred WSUD options and projects, and can add significant value to the development of a business case. Cost-benefit analysis and multi-criteria analysis are discussed below.

Cost-benefit analysis

Cost-benefit analysis (CBA) at its highest level is a method for organising information to provide guidance on the efficient allocation of resources, or selection of a preferred option. There are two main features of CBA as an analytical tool:[11]

- costs and benefits are expressed as far as possible in money terms and hence are directly comparable with one another, and
- costs and benefits are valued in terms of the impacts they have on the community as a whole, so the perspective is a 'global' one rather than that of any particular individual or interest group.

Undertaking a CBA can provide a council with quantitative comparisons of WSUD options. CBA serves to aid decision-making; however it is important that a cost-benefit analysis does not replace the need for sound judgment based on a wide range of considerations.

9 Department of Treasury and Finance 2008, *Investment Lifecycle Guidelines*, Melbourne.

10 City of Port Phillip, 2010.

11 Department of Finance and Administration, *Handbook of Cost-Benefit Analysis*, Canberra.

A CBA is flexible and can generally be applied to assess most WSUD projects. However, a CBA has some limitations in terms of unvalued costs and benefits. For example, it is often difficult to assign a monetary value to all costs and benefits, such as improved water quality and river health. This is where alternative forms of qualitative analysis, such as multi-criteria analysis, can be useful (see below).

Box 7.3 outlines how CBA can assist council in considering WSUD projects.

Multi-Criteria Analysis

Multi-criteria analysis (MCA) can assist a council in determining a preferred option for a particular WSUD project by assessing potential WSUD options against an agreed set of objectives and criteria. In simple circumstances, the process of identifying objectives and criteria may alone provide enough information for a council to select a preferred option. A Triple Bottom Line or sustainability analysis is a form of MCA.

A key feature of MCA is its emphasis on the judgment of the council team, in establishing objectives and criteria, estimating relative weights and in judging the contribution of each option to each performance criterion. MCA can be particularly useful by bringing a degree of structure, analysis and openness to qualitative judgements that lie beyond the practical reach of CBA[12].

Box 7.4 outlines the benefits of undertaking MCA.[13]

Melbourne Water developed a multi-criteria assessment tool for selecting WSUD projects to be eligible for funding through Melbourne Water's Stormwater Program. The MCA tool has three categories covering: environmental; engagement; and financial. Within each category, a series of indicators of different weightings are applied to score a project.[14]

Working in partnership with councils, City West Water has used MCA to inform selection of alternative water solutions to achieve whole of water cycle resource management. City West Water's MCA has featured seven criteria covering: project timing; volume; quality and reliability; cost; implementation risk; social and stakeholder; and environment.[15]

Box 7.3: Benefits of undertaking CBA

Council can employ cost-benefit analysis in various ways to:

- decide whether a proposed WSUD project or initiative should be undertaken
- decide whether an existing WSUD project or initiative should be continued, and
- choose between alternative WSUD projects and initiatives.

Source: adapted from Department of Finance and Administration, *Handbook of Cost-Benefit Analysis*, Canberra.

Box 7.4: Benefits of undertaking Multi-Criteria Analysis

MCA has many advantages over informal judgment unsupported by analysis:

- it is open and explicit
- the choice of objectives and criteria that the decision making group may make are open to analysis and to change if they are felt to be inappropriate
- scores and weights, when used, are also explicit and are developed according to established techniques. They can also be cross-referenced to other sources of information on relative values, and amended if necessary
- performance measurement can be sub-contracted to experts, so need not necessarily be left in the hands of the decision making body itself
- it can provide an important means of communication, within council, between councils, and between council and the community, and
- scores and weights are used, it provides an audit trail.

Source: Department of Communities and Local Government, Multi-Criteria Analysis: A Manual, London.

12 Department of Communities and Local Government, *Multi-Criteria Analysis: A Manual*, London.

13 For a detailed guide to MCA, see: http://eprints.lse.ac.uk/12761/1/Multi-criteria_Analysis.pdf

14 Urrutiaguer, M,. Lloyd, S. and Lamshed, S. 2010, "Determining water sensitive urban design project benefits using a multi-criteria assessment tool", in *Water Science & Technology*, Vol. 61, No. 9, pp. 2333–2341.

15 See: http://www.mav.asn.au/CA256C320013CB4B/Lookup/AnneBarker/$file/Anne%20Barker.pdf

7.7 Selected decision-making support tools

› *Investment Lifecycle Guidelines, Victorian Department of Treasury and Finance, Melbourne.*

– See: http://www.lifecycleguidance.dtf.vic.gov.au/

A comprehensive resource for developing business cases, and undertaking strategic assessments and options analyses.

› *Handbook of Cost-Benefit Analysis, Australian Department of Finance and Administration, Canberra.*

– See: http://www.finance.gov.au/publications/finance-circulars/2006/01.html

A comprehensive resource that provides guidance in the use of cost-benefit analysis for evaluation and decision-making.

› *Multi-Criteria Analysis: A Manual, Department of Communities and Local Government, London*

– See: http://eprints.lse.ac.uk/12761/1/Multi-criteria_Analysis.pdf

A detailed manual that provides guidance on undertaking and making the best use of multi-criteria analysis for the appraisal of options.

› *Triple Bottom Line Guidelines, Melbourne Water, Melbourne*

– See: http://www.lifecycleguidance.dtf.vic.gov.au/section.php?section_ID=1

A useful step-by-step guide in undertaking a triple-bottom-line analysis.

› *Water by Design (2010). A Business Case for Best Practice Urban Stormwater Management (version 1.1)*

South East Queensland Healthy Waterways Partnership, Brisbane, Queensland.

– See: http://waterbydesign.com.au/businesscase

(registration, which is free, is required to download documents)

8 Engagement Processes for Developing and Delivering WSUD Targets

Key Points

Engagement with internal and external stakeholders will be required throughout the development of WSUD implementation targets.

Early and continual engagement will help ensure that WSUD implementation targets are understood and widely supported.

A stakeholder engagement plan will help ensure that engagement is appropriately planned, resourced and delivered.

8.1 Introduction

Stakeholder engagement is a key supporting process that will apply to all stages of developing, adopting and delivering WSUD implementation targets. Early and continual engagement with internal and external stakeholders will help ensure that WSUD implementation targets are understood and widely supported.

This section introduces key elements of effective stakeholder engagement (see Box 8.1) including engagement planning, design, conduct and review. It provides examples of how councils have used engagement to support development of WSUD implementation targets.

Background information on key engagement processes is provided in Appendix A8.1.

Many councils will already have a council-wide engagement policy or framework, and will be using a range of engagement techniques and processes to engage with internal and external stakeholders. These frameworks and approaches will be able to be used in developing WSUD implementation targets, and for undertaking engagement on specific WSUD projects and initiatives to achieve WSUD implementation targets.

Box 8.1: What is engagement, and who is a stakeholder?

"Engagement" is a broad, inclusive term that describes a range of interactions between people, groups and organisations. Engagement can cover a variety of approaches, such as one-way communication or information delivery, and two-way or interactive consultation and involvement in decision-making.

A stakeholder is someone who may be affected by or have a specific interest in a decision or issue under consideration. Stakeholders may be internal or external to an organisation and may be direct or indirect beneficiaries of any action, such as development of WSUD implementation targets.

Source: Department of Sustainability and Environment 2005, *Book 1, An introduction to engagement*, pp. 10 and 14.

Effective stakeholder engagement will strongly support design and delivery of WSUD implementation targets.

8.2 Effective stakeholder engagement and WSUD implementation targets

Key steps for effective stakeholder engagement with WSUD implementation targets are:

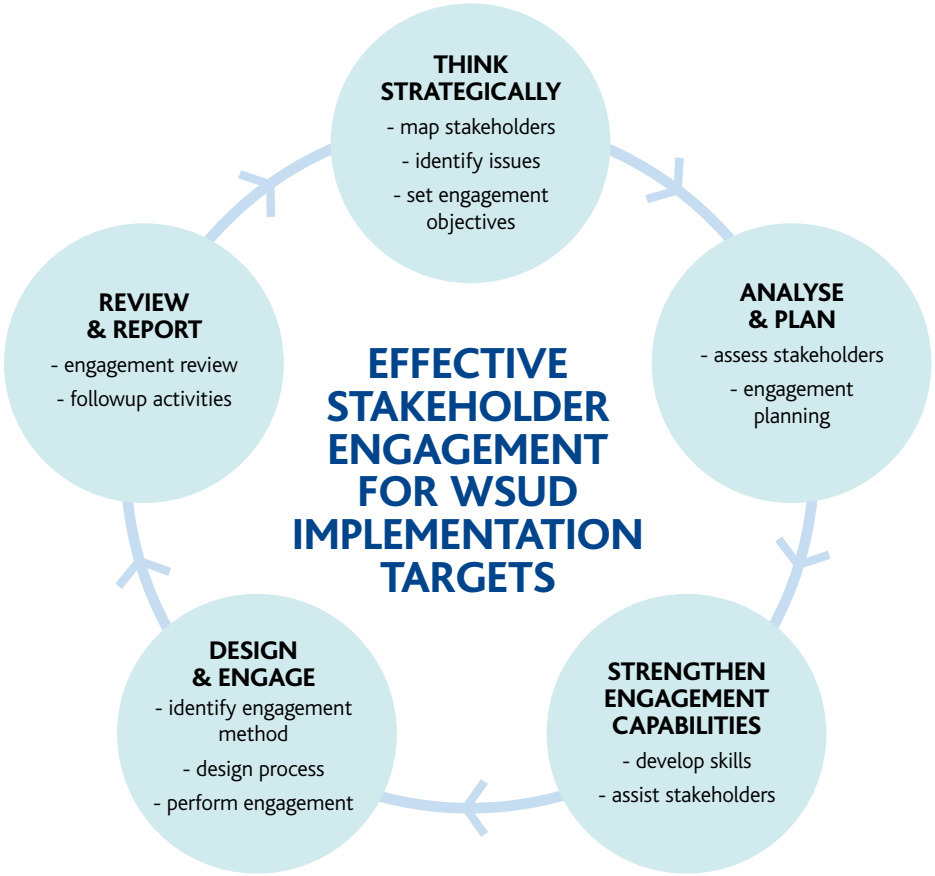
- thinking strategically and identifying key stakeholders and interests;
- analysing and plan the engagement;
- strengthening engagement capabilities with appropriate training;
- designing and conducting the engagement; and
- reviewing and reporting on the engagement process.

These steps are illustrated in Figure 8.1, and further discussed in Appendix A8.1.

Effective stakeholder engagement will promote and support development and ownership of WSUD implementation targets within council, other organisations, such as Melbourne Water, and with the community. Where engagement is done well, it will promote accountability for WSUD implementation targets.

Engagement can especially tap into local or specialist knowledge on WSUD implementation targets and integrated water management. At times, a better WSUD solution may emerge because of engagement, and the engagement process can achieve further support for WSUD. By addressing any concerns early, an engagement process can reduce or even prevent conflict regarding WSUD implementation targets later on.

Figure 6.1: Levels of Capacity to Deliver WSUD Implementation Targets



Source: adapted from AccountAbility, the United Nations Environment Programme, and Stakeholder Research Associates 2005 *The Stakeholder Engagement Manual Volume 2: The Practitioner's Handbook on Stakeholder Engagement*.

Tasks to consider to support engagement on WSUD implementation targets:

- Develop an engagement plan to support the development of a water vision and objectives, and WSUD implementation targets.
- Develop "fit-for-purpose" engagement plans for specific WSUD projects.
- Seek early advice and assistance from a council engagement team on the engagement process.

It can also be valuable to consider how to strengthen the capability of stakeholders to more effectively engage and contribute to development of WSUD implementation targets. For example, by improving community understanding of WSUD and the benefits of implementation targets and improved urban water management, to promote active participation in any engagement program.

8.3 Internal stakeholders and WSUD implementation targets

To strengthen internal relationships, promote integration, and gain support for WSUD implementation targets, engagement is required at all levels of council. Given that councillors and/or council officers may change roles, engagement needs to be on-going and planning should support this.

Key internal stakeholders for the development and delivery of WSUD implementation targets include:

- Councillors;
- Council executive;
- Council staff from across all departments; and
- Advisory committees and groups.

Councillors set policy and strategy direction and approve Council Plan and budget. Although a single councillor cannot make decisions on behalf of council, they can champion issues and gain support to develop policy and progress actions, such as WSUD implementation targets. Early engagement is promoted to identify how councillors may wish to be involved with the development of an integrated water management strategy.

Executive or senior council officers determine priority issues to be included in council's strategies and in the annual budget prior to submission to council for approval. Council officers provide relevant information and advice to council and implement council policies and strategies, such as for WSUD or IWM.

Many councils will have issue based advisory committees to inform a council's decisions (e.g. Environment Advisory Committees and Planning Advisory Committees). The membership of an advisory committee can consist of councillors, council officers, community members and often representation from other stakeholders and organisations (e.g. government agencies and research institutions). Advisory committees can be useful to make recommendations for a council's consideration, such as on WSUD implementation targets.[1]

Tasks to consider with internal council engagement:

- Engage with councillors and council executive early in the development of WSUD implementation targets to identify how they may wish to be involved.
- Engage and interact with all council departments to get input into the development of WSUD implementation targets.

An example of an internal council engagement process to support development of a water cycle strategy and WSUD implementation targets is outlined in Box 8.2.

Box 8.2: Internal engagement to support the development of Kingston's Water Cycle Strategy

The development of a Water Cycle Strategy by City of Kingston has involved significant internal engagement and coordination. A key goal of the Water Cycle Strategy is to "encourage a cultural adoption of sustainable water cycle management across the council" and bring key stakeholders on "the journey". In addition to a project steering committee, an internal project group was established consisting of key internal stakeholders to provide input, build capacity and understanding across the council. A series of briefings, internal papers and councillor updates have been provided as part of the project.

Source: City of Kingston 2010.

1 See *Fact Sheet 3 – Council Processes and Engagement Tips*, Local Government and Natural Resource Management (NRM) Series, Municipal Association of Victoria, 2007.

8.4 External stakeholders and WSUD implementation targets

A range of external departments, agencies, groups and the community may have an interest in WSUD implementation targets (see Box 8.3). It is important to consider who may have an interest to identify who to engage, and how to generate support and ownership for WSUD implementation targets.

A participatory approach to adopting WSUD implementation targets has been undertaken in City of Port Phillip as part of the development of the Council's *Water Plan*. The *Water Plan* is a strategic document prepared to meet Council's and the community water management needs (see Box 8.4).

City of Port Phillip has recognised that:[2]

"Effective community engagement is critical as it motivates community participation in the delivery of WSUD and integrated urban water management solutions at the local or catchment wide scale."

"City of Port Phillip recognises that partnerships and collaboration on sustainability issues is essential. Empowering the community to take action is a key part of creating a city and region with the smallest possible ecological footprint."

Box 8.3: Key external stakeholders for WSUD implementation targets

Key external stakeholders that should be considered in the development of WSUD implementation targets are:

State Government

Melbourne Water
Retail water businesses
Department of Sustainability and Environment
Department of Planning and Community Development
Environment Protection Authority

State/Regional Groups

Stormwater Industry Association of Victoria
Business groups
Research groups (e.g. Monash University Water Program)
Clearwater
Environment Victoria

Community Groups

Local resident and business groups
Local environment groups

Local Residents and Businesses

Box 8.4: Example community engagement process, City of Port Phillip

City of Port Phillip used a range of community engagement processes in preparing its *Water Plan* with WSUD implementation targets:

- Advertisements and distribution to residents of *Climate Conversations* and *Water Plan* brochures and postcards
- Lengthy public comment period with key stakeholder consultation. The draft *Water Plan* was available for public comment between 14 December 2009 and 23 April 2010
- One main information and consultation session at the St Kilda Town Hall on 4 March 2010, with over 80 attendees
- One informal information and consultation session at the Middle Park beach foreshore on 20 March 2010, with over 80 attendees, and
- Media and web based communications, with submissions and community comments received through Council's *Have your say* webpage, ASSIST (service centre), and email responses.

Source: City of Port Phillip 2010, *Council Meeting Paper, 8.6 Water Plan Review, Attachment 1, Community Consultation Process.*

2 City of Port Phillip, 2010. *Water Plan, Toward a Water Sensitive City*, p. 67.

Tasks to consider with external council engagement:

- Consider a range of ways to actively engage with the community and key external groups on WSUD implementation targets.
- Allow sufficient time for external engagement and informed community responses.

8.5 Key engagement processes

Effective stakeholder engagement will be essential for:

- the development of WSUD implementation targets; and
- the delivery of WSUD implementation targets with the design and implementation of specific WSUD initiatives and projects.

General engagement principles and approaches will be similar for both developing and delivering WSUD implementation targets. However, some engagement techniques may work better as identified below.

Engagement with development of WSUD implementation targets

Engagement on a draft WSUD strategy and draft WSUD implementation targets could involve:

- brochures and letters promoting and encouraging submissions;
- consultation paper and submission process;
- focus groups and taskforces;
- workshops and open days; and
- web-based material on WSUD implementation targets.

An example of an internal council engagement process to assist development of WSUD implementation targets is outlined in Box 8.5.

Box 8.5: Water Taskforce, City of Port Phillip

As part of the development of the Port Phillip *Water Plan*, an internal Water Taskforce with senior management and coordinators from relevant departments across Council was established and chaired by the Chief Executive. The key purpose of the Taskforce is to support the development of the *Water Plan* for the City of Port Phillip. The Taskforce has now evolved to jointly cover energy and water management. The Taskforce meets monthly and provides an important forum for discussing and advancing WSUD implementation targets and the overall Water Plan across Council.

Source: City of Kingston 2010.

The development of WSUD implementation targets may first require improving understanding of WSUD and the role of implementation targets. A range of engagement approaches are available to provide information and build understanding of the importance of WSUD and implementation targets including:

- brochures, leaflets and newsletters;
- exhibitions, events and displays;
- media releases, radio advertisements and interviews; and
- emails and other web-based material.

General tips for good stakeholder engagement to support development of WSUD implementation targets are outlined in Box 8.6.

Box 8.6: Tips for good stakeholder engagement to support development of WSUD implementation targets

1. Engage stakeholders early in the WSUD implementation targets process.
2. Ask stakeholders how they want to engage with you, and where possible, make sure there is two-way dialogue.
3. Stakeholders may have a different agenda – identify what WSUD objectives you share or are different.
4. Stakeholders are usually busy people – communicate appropriately, relevantly and thank them for their input.
5. Keep stakeholders informed and keep them involved.
6. Above all, treat your stakeholders as you would wish to be treated yourself which means making the effort to get to know them.

Source: adapted from UK Government Communication Network.

Engagement with the delivery of WSUD implementation targets

Once WSUD implementation targets have been established, engagement on a specific WSUD initiative or project could involve:

- exhibitions and displays;
- planting day;
- focus groups and advisory committees;
- consultation papers and submission process; and
- meetings and representative forums.

Community meetings provide an opportunity for residents to meet with councillors and council officers to discuss council services and projects, and raise issues of interest to the community surrounding WSUD implementation targets. There may be opportunities to achieve increased community ownership of WSUD initiatives through appropriate community engagement.

Advisory committees can be especially helpful in supporting the development of WSUD implementation targets. An advisory committee may have a strong technical focus to provide a range of expert advice and support to council officers. Alternatively, an advisory committee may be drawn from key stakeholder groups and community representatives to actively support the development of WSUD implementation targets and promote improved understanding of WSUD across organisations and groups.

An example of an external WSUD engagement is the Moonee Valley City Council "Catching the Rain" community forum (see Box 8.7).

Box 8.7: "Catching the Rain" Community Forum

As part of a series of regular community forums on the environment and sustainability, in June 2010, Moonee Valley City Council held a forum on "Catching the rain". The free event at Flemington Community Centre informed residents about the best water solutions for their home, how they can help protect local waterways and about the future of water in Moonee Valley. The event helped residents explore the changes they can make in their home and garden, not only to save water but also to improve the quality of stormwater entering the Maribyrnong River and other local waterways. Guest speakers discussed how to install rainwater, grey water and waste water systems into homes, and how to manage stormwater and protect local waterways.

Source: Moonee Valley City Council 2010.

Challenges with engagement and potential constraints

Key challenges with stakeholder engagement and participation often centre around communication of technical content, various levels of knowledge across stakeholders, as well as access to information, finances and time. These challenges need to be overcome to successfully develop of WSUD implementation targets.

Potential constraints can include:

- lack of awareness of the engagement process, council or WSUD implementation targets;
- literacy and accessibility, such as, access to the internet, email or telecommunications, and difficulties in getting to venues or concern about the engagement location to discuss WSUD implementation targets; and
- privacy concerns, lack of time, or concerns about travel costs and lost working time.

Thoughtful design of the engagement process and targeted support for stakeholders may remove some of these constraints to participation.

Finding a balance between formal and informal engagement processes is also important. Sound engagement processes are essential, but informal engagement, such as talking to council staff over a morning tea or with local residents and businesses at shopping centres or sporting events, can also encourage interest in WSUD.

Particular challenges with any external engagement include overcoming any history of distrust or misunderstanding, and "consultation fatigue". Open, honest and carefully planned and conducted engagement processes will be essential. At times, extra effort will be required to make it easy for stakeholders to respond to any engagement process. It is important not to assume understanding of WSUD related terms, such as "potable water" or "gross pollutants".

Engagement processes can inadvertently raise expectations beyond what can be reasonably delivered. To reduce the risk of this occurring, it is important to be clear about the purpose of the engagement, what is hoped to be achieved, and what can or cannot be undertaken. Reporting back on the outcomes of engagement processes is also essential.

8.6 Selected engagement resources

- *Consultation and Engagement Resources, Victorian Local Governance Association, Victoria*
  - See: www.vlgaconsultation.org.au/

  A useful general resource for Victorian councils on consultation and engagement.
- *Effective Engagement Kit, 2005, Department of Sustainability and Environment, Victoria*
  - See: www.dse.vic.gov.au/dse/wcmn203.nsf/Home+Page/8A461F99E54B17EBCA2570340016F3A9?open

  A comprehensive resource for stakeholder engagement in Victoria including:

  Book 1 – An introduction to Engagement

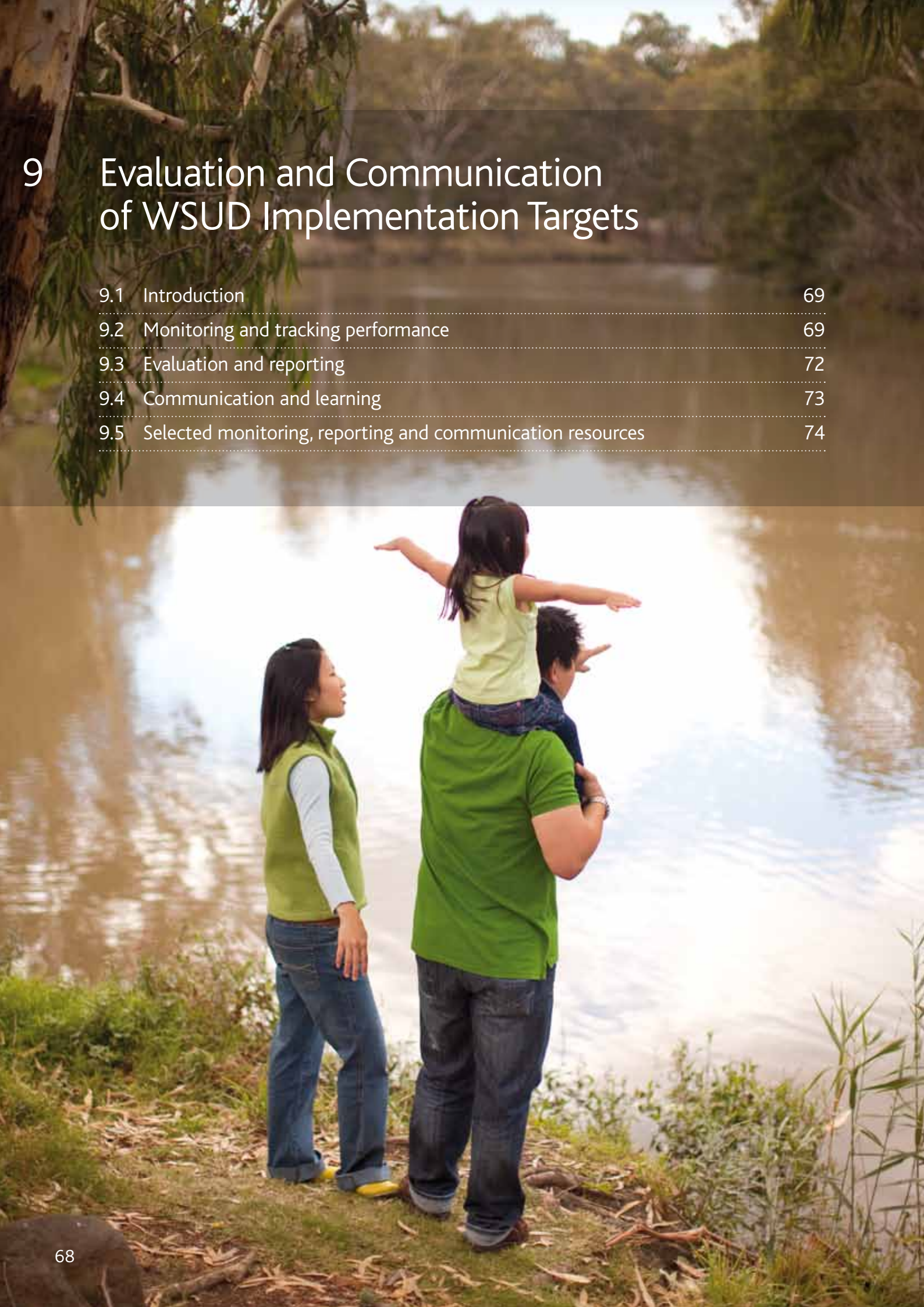
  Book 2 – The Engagement Planning Workbook

  Book 3 – The Engagement Toolkit
- *The Stakeholder Engagement Manual Volume 2: The Practitioner's Handbook on Stakeholder Engagement, 2005, AccountAbility, the United Nations Environment Programme, and Stakeholder Research Associates, Ontario, Canada*
  - See: www.accountability.org/uploadedFiles/publications/Stakeholder%20Engagement%20Handbook.pdf

  A comprehensive international guide to stakeholder engagement including templates and resources for analysis, planning and review.
- *IAP2 - International Association for Public Participation Australasia*
  - See: http://www.iap2.org.au/

  An Association of members that seek to promote and improve the practice of public participation with practice development, resources and weblinks.

9 Evaluation and Communication of WSUD Implementation Targets



Key Points

Monitoring, evaluation, and reporting are key processes for supporting the successful delivery and review of WSUD implementation targets and associated programs and activities.

Monitoring, evaluation, and reporting processes will require good design and sufficient resourcing to effectively support achievement of WSUD implementation targets.

Communication will support change management, share and leverage learning and keep key stakeholders informed of progress with the delivery of WSUD implementation targets.

9.1 Introduction

This section introduces the role of monitoring, evaluation and reporting in developing, adopting and delivering WSUD implementation targets, and provides some guidance on these processes. Monitoring, evaluation and reporting promote learning and adaptative management. When performed well, they will assist improvements in WSUD program design and achievement of desired outcomes and implementation targets.

This section also considers the importance of communicating progress on WSUD implementation targets to a range of stakeholders. Communication about implementation targets and WSUD more generally to internal and external stakeholders is essential to broaden understanding and achieve increased support for further progress. Traditional and innovative communication processes will help share and leverage learning.

WSUD implementation targets will require periodic review, such as when industry standards (e.g. best management practices objectives for stormwater treatment[1]) change. Figure 9.1 illustrates the continuous cycle of monitoring, evaluation, reporting and improvement.

9.2 Monitoring and tracking performance

Monitoring involves collection and analysis of data and information to assist timely decision making, ensure accountability and provide the basis for evaluation and learning. Monitoring is a continuing function that relies on methodical collection of data to identify progress and assess achievement of objectives.[2]

Monitoring is a key element to support delivery of WSUD implementation targets. It will help identify whether a WSUD program, project or technology is achieving its aims and meeting implementation targets, and whether there is a need to make any adjustments. Resources need to be committed for monitoring so that it becomes an integral part of the program and project cycle.

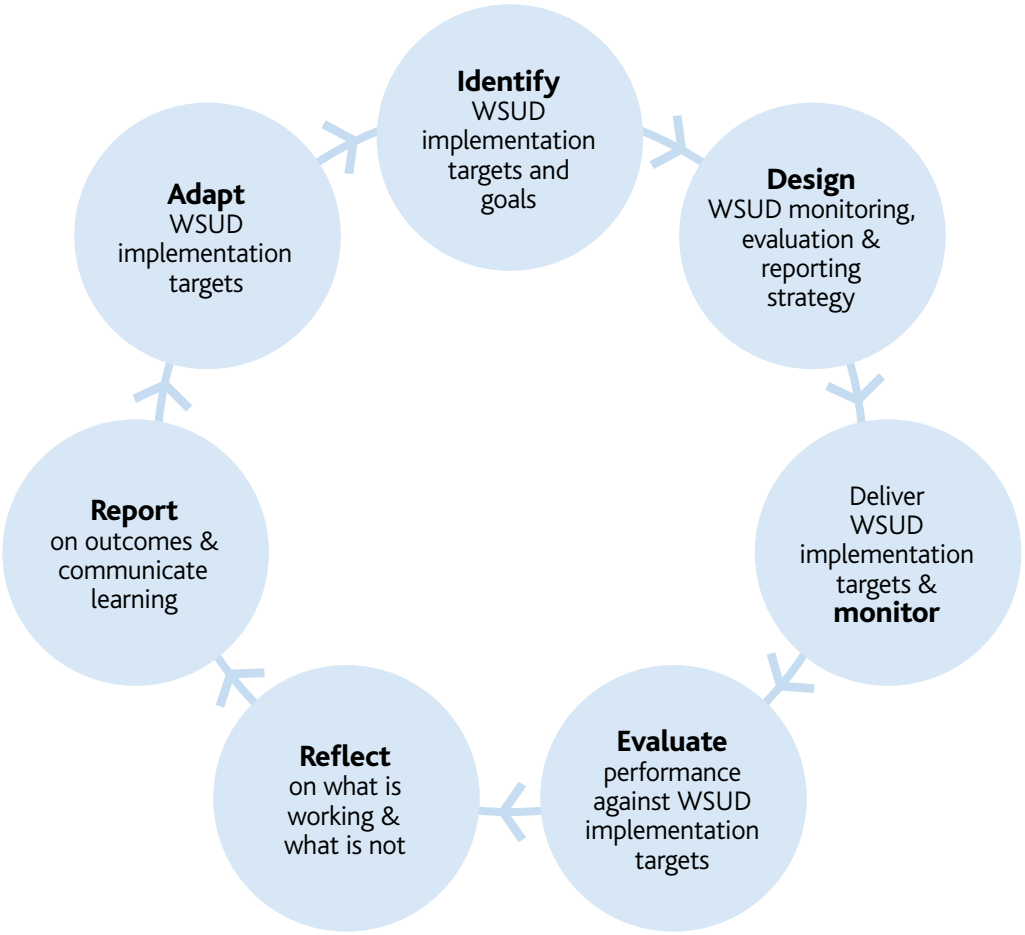
Monitoring may be undertaken for different reasons and at different levels. For example, to assess achievement of WSUD implementation targets, policy and objectives, to assess a specific WSUD program or to assess the performance of individual WSUD initiatives or technologies.

Monitoring is a key element to support delivery of WSUD implementation targets.

1 As defined in: Urban StormWater: Best Practice Environmental Management Guidelines, Victorian Stormwater Committee (1999). ISBN 0 643 06453 2, CSIRO publishing, Collingwood, Australia.

2 Australian Government 2009, Natural Resource Management Monitoring, Evaluation, Reporting and Improvement Framework, Canberra, p. 9.

Figure 9.1: Monitoring, evaluation, and reporting on WSUD implementation targets



Source: adapted from Australian Government 2009, *Natural Resource Management Monitoring, Evaluation, Reporting and Improvement Framework*, Canberra, p. 9.

Monitoring the implementation of WSUD could involve:

- tracking overall progress against the WSUD Implementation targets adopted by council;
- tracking overall progress against WSUD program or project goals;
- preparing an annual water account (as proposed by City of Port Phillip[3] for example);
- tracking costs and expenditure, especially of WSUD components that are part of larger projects.
- assessment of asset condition and maintenance regimes;
- tracking changes in capacity, organisations, institutions, practices and technologies; and
- measuring actual performance against design

Monitoring is a key element of any water plan or integrated water management strategy (see Box 9.1). Effective monitoring and tracking of costs and performance can help to ensure that adequate resources continue to be provided for implementation of WSUD initiatives. It also allows for the assessment of progress, and the identification and resolution of any problems.

Monitoring of WSUD will require careful design and consideration of costs and benefits of actual and modelled data. For example, consideration will need to be given to what data are used to report on project benefits and contribution to WSUD implementation targets. This also means that there will be a need for council to establish a clear process allowing these data to be captured throughout the year.

3 See City of Port Phillip 2010, *Water Plan, Toward a Water Sensitive City*, p. 65.

4 See Victorian Auditor-General's Office (VAGO) 2008, *Performance Reporting in Local Government and Local Government Performance Reporting: Turning Principles into Practice*, Melbourne, for further information on designing effective performance indicators.

Stormwater treatment benefits of WSUD projects can be estimated using MUSIC. An assessment of annual performance against WSUD implementation targets for stormwater can then be done based on aggregated data of benefits modelled for each project. It would be thus beneficial for council to make MUSIC modelling a requirement for the design of WSUD projects. When there are significant variations between constructed assets and their original design, the model will need to be amended to better reflect the treatment performance of the implemented asset.

If council used different pollutant concentrations than the MUSIC default to set its target, then these concentrations used should be used for all projects evaluated. Alternatively, the accounting could be adjusted to allow a comparison against targets.

Monitoring will be more efficient where it can be aligned with corporate, financial and project management monitoring and reporting frameworks. Council officers and managers will also require sufficient skills and knowledge specific to WSUD, and sufficient resources to gather and assess monitoring data. Monitoring and tracking of WSUD installations and initiatives can also be incorporated and linked to other Council processes, such as asset management systems and GIS databases.

Tasks to consider with monitoring WSUD implementation targets:

- Establish a clear process to capture the benefits of the WSUD projects implemented by councils, including treatment performance.
- Align and link monitoring of WSUD implementation targets and WSUD programs and actions to existing council monitoring and reporting processes.
- Consider making MUSIC modelling a requirement for the design of WSUD projects.

Box 9.1: City of Port Phillip Monitoring Plan

The Port Phillip Water Plan sets integrated water management targets for 2020 and outlines five strategies for integrated water management. The Water Plan will be implemented through four key mechanisms: an action plan; a capacity building program; a communications program; and a monitoring plan. The Council will monitor delivery against targets, track individual project performance, and evaluate the ongoing effectiveness of the Water Plan. The Action Plan will be reviewed on a six monthly basis followed by an annual review of overall delivery to plan. All adopted integrated water management targets will be reviewed in 2014.

Source: adapted from City of Port Phillip 2009, *Water Plan, Toward a Water Sensitive City*, pp. 5 and 65.

Designing performance indicators

Performance indicators (or measures) will support the assessment of progress toward and the achievement of WSUD implementation targets. Performance indicators can be qualitative or quantitative, but to be useful, they must be capable of regular and reliable measurement. Ideally, performance indicators will cover time, cost, quality and quantity dimensions of WSUD performance.

Performance indicators that relate to all aspects of WSUD implementation targets could be developed, from inputs, such as funding and staff resources, through to WSUD activities and processes, to outputs, the WSUD services and projects provided. Performance indicators can also be developed to measure achievement against intended outcomes, such as water savings, improved water quality or healthier waterways – often the focus of specific WSUD implementation targets.

Important characteristics of useful performance indicators include:[4]

- relevant – are directly relevant to WSUD implementation targets and contribute to assessing progress;
- appropriate – quantitative and qualitative measures cover time, cost and quality and provide meaningful information to assess performance;
- comprehensive – to support assessment of performance against all WSUD objectives and implementation targets;
- consistency and comparable – so that monitoring data can be gathered and calculated consistently over time; and
- context – performance data should be provided for the prior period(s), including trends; and on the reasons for any significant variance from targets or expected results.

Box 9.2 Tests of "Good Indicators"

A range of guides or tests for good indicators have been developed. One simple to use approach is the "SMART test" or whether an indicator is:

- Specific – clear and concise
- Measurable – quantifiable
- Achievable – practical & reasonable
- Relevant – to users, and
- Timed – range or time limit.

Source: Victorian Auditor-General's Office (VAGO) 2008, *Performance Reporting in Local Government and Local Government Performance Reporting: Turning Principles into Practice*, Melbourne.

Monitoring challenges

Monitoring needs to have a specific purpose, such as helping to inform future WSUD implementation targets, program or management decisions, or WSUD initiatives. At times, data and information collected from monitoring programs has been of limited use with respect to improving the understanding of the WSUD initiatives or measures that were being evaluated.[5] Monitoring programs to assess the cost effectiveness of a WSUD program or initiative should be carefully designed to ensure the best outcomes. At times, it may be better to facilitate regional monitoring through collaboration with other councils and agencies, or in partnership with research groups.

Regional monitoring is especially relevant for water quality testing of the discharge flows of WSUD projects as monitoring regimes that provides statistically valid data are potentially costly.

It is noteworthy that extensive research has been undertaken on stormwater treatment systems such as raingardens and wetlands, including performance testing of both laboratory pilots and full-scale assets (e.g. raingardens and wetlands owned by councils or Melbourne Water). This research informs current industry practices and standards; for example, MUSIC treatment algorithms for bioretention systems are based on the latest research findings from FAWB[6]. As such, if projects are designed using current guidelines, constructed as designed, and well maintained, their performance can be adequately estimated using modelling methods.

It should emphasised however that it is important to undertake regular condition assessment (e.g. plant health, hydraulic conductivity) of assets implemented to ensure their integrity, and thus their performance, is preserved overtime.[7]

9.3 Evaluation and reporting

Like monitoring, evaluation and reporting are key processes that support the planning and delivery of WSUD implementation targets and management of WSUD policies and programs. Evaluation should be considered at every stage of the delivery of implementation targets, such as planning, investment, engagement and implementation.

Broadly, the term "evaluation" encompasses periodic assessment of the appropriateness, impact, effectiveness, efficiency and legacy of a policy, program or project to improve performance. An evaluation may be internal or external, and use formal or informal approaches.

Evaluation is a systematic process of collecting credible data and using it to make judgements about the worth of, for example, a WSUD program or process at any point in a program's or project's life cycle. Ideally, evaluation starts from the moment a program is designed and runs through the entire life cycle. Evaluation provides a feedback mechanism for continuous improvement.

A series of key evaluation questions applicable to WSUD implementation targets are outlined in Appendix A9.1.

Ideally, WSUD or IWM strategies will contain dedicated review and evaluation requirements. For example, in their IWM strategy (Total Watermark – City as Catchment), City of Melbourne has outlined that:[8]

"Total Watermark – City as a Catchment will be fully reviewed in 2012 in accordance with changes in policy, design, technology, behaviour and other factors. Partial reviews may occur before this time. Action plans will be undertaken annually and yearly progress towards achieving the targets will be reported in the City of Melbourne's annual report."

A priority area of the Knox City Council WSUD and Stormwater Management Strategy 2010 is reporting and evaluation:[9]

Each year the effectiveness of implemented WSUD works will be reported, including pollutant load reductions, and area of catchment treated. We will also work in collaboration with others to report on changes in the health of the municipality's creeks.

Tasks to consider with evaluating and reporting on progress:

- Design an evaluation and reporting process to track WSUD implementation targets and, where possible, make use of existing Council reporting processes.
- Plan to periodically evaluate the appropriateness, impact, effectiveness, efficiency and legacy of WSUD implementation targets and associated WSUD programs and activities.

5 Joint Steering Committee for Water Sensitive Cities 2009, *Evaluating Options for Water Sensitive Urban Design – A National Guide*, Canberra.

6 Facility for Advancing Water Biofiltration. FAWB has now been integrated into the Centre for Water Sensitive Cities (www.watersensitivecities.org.au)

7 For more information on performance assessment see: Facility for Advancing Water Biofiltration, June 2009, Adoption Guidelines for Stormwater Biofiltration Systems, p.66-77 and , Monash University.

8 City of Melbourne 2009, Total Watermark, City as a Catchment, p. 8.

9 Knox City Council 2010, Water Sensitive Urban Design and Stormwater Management Strategy 2010, Melbourne.

Evaluation challenges

Conducting an effective WSUD program or project evaluation can be a challenging process. Sometimes this is because the evaluation process is difficult to understand or there may be limited resources or time available for an evaluation. At times, it can also be difficult to obtain credible performance data and analyse it appropriately.[10]

To overcome these challenges requires sufficient understanding, resourcing and support for evaluation within a Council. It may take time to generate this support and demonstrate the value and learning from the evaluation process.

9.4 Communication and learning

Communication is a key component of any change process, such as developing WSUD implementation targets. The larger the potential impact or change, the greater the need for clear communication of the reasons and rationale behind the initiative, the benefits expected, implementation plans, and proposed effects. Without effective communication, internal and external stakeholders may miss out on vital information and may not understand why change is needed, or the benefits to them of the change.[11]

Box 9.3: Key questions with developing a communication strategy for WSUD implementation targets

Has sufficient consideration been given to communication requirements for WSUD implementation targets, including how any major obstacles to communication might be overcome?

Is the communication strategy structured around the success criteria for WSUD implementation targets?

Does the communication strategy address proactive and reactive management of media/press activities?

Have sufficient resources been allocated for communication requirements on WSUD implementation targets?

Are communications appropriately targeted to particular stakeholder groups?

Is the nature and timing of communication aligned with delivery and review of WSUD implementation targets and major activities?

Source: adapted from Department of Prime Minister and Cabinet and Australian National Audit Office 2004, *Implementation of Programme and Policy Initiatives Making Implementation Matter, Better Practice Guide*, Canberra, pp.47-48.

The broad objectives of communication are to:[11]

- keep awareness, understanding and commitment high
- maintain consistent and coherent messages, and
- ensure that expectations match what will be delivered.

Box 9.3 identifies a series of key questions that could inform development of a communications strategy for WSUD implementation targets. A series of key questions that could support preparation of a Communications Plan for WSUD implementation targets are outlined in Appendix A9.2.

An important part of embedding WSUD in a Council and community is sharing and leveraging learning, and communicating performance. Communication opportunities for WSUD should be identified as part of developing a new water plan or strategy (see Box 9.4).

Box 9.4: City of Port Phillip Communication Plan

The City of Port Phillip has targeted internal and external communication in the Water Plan. An internal communications plan will be implemented to:

- increase staff general awareness of the Water Program and relevant targets
- educate staff involved in the delivery or maintenance of WSUD
- communicate Council learning
- promote and support the WSUD referrals process (Technical Group)
- promote Council success, and
- support staff involved in the delivery of the external communications plan.

An external communications plan will be implemented to:

- increase community general awareness of Council's Water Program, actions and relevant targets
- educate the community about integrated water management
- increase community awareness of what they can do to contribute to targets
- increase the uptake of WSUD by the community, and
- promote Council leadership.

Source: City of Port Phillip 2009, *Water Plan, Toward a Water Sensitive City,* p. 64.

10 Australian Government 2009, Natural Resource Management Monitoring, Evaluation, Reporting and Improvement Framework, Canberra.

11 Department of Prime Minister and Cabinet and Australian National Audit Office 2004, Implementation of Programme and Policy Initiatives Making Implementation Matter, Better Practice Guide, Canberra, p.47.

Box 9.5: Broadmeadows Main Street Extension

Main Street Extension is a vibrant new streetscape in the centre of Broadmeadows. Hume City Council led a diverse team of stakeholders and professionals to deliver this flagship project. The result is an engaging and animated space with the flexibility to cater for varied uses, and it is a showpiece for sustainable stormwater management. The design documentation and stakeholder workshop period ran from mid-2008 until early 2009, and construction was completed in March 2010. The streetscape was opened at a community festival and street naming ceremony launched by Planning Minister Justin Madden MP on 20 May 2010. The fair-style event attracted over 300 community members and on its first use the street supported the ultimate shared-street experience.

Source: Hume City Council 2010.

Communication opportunities and events will also be able to be planned as part of the opening of major WSUD and capital works projects (see box 9.5). The demonstration of WSUD initiatives will greatly assist with enhancing understanding of the role and contribution of WSUD to urban water management.

The City of Melbourne has developed a performance scorecard as a communication tool to help staff and developers understand the impact of WSUD and account for implemented WSUD treatments. Implemented WSUD initiatives are measured through a tracking spreadsheet and provide a general understanding of the potential water quality impacts of different WSUD projects. (see Figure 9.2 opposite). The points system primarily supports communication but it also assists in assessing performance and progress with planning and delivering on projects.

Communicating progress on WSUD implementation targets:

- Develop and implement a communication program to support delivery of WSUD implementation targets and major WSUD programs and activities.
- Seek early advice and assistance from a Council communications team.

9.5 Selected monitoring, reporting and communication resources

- Joint Steering Committee for Water Sensitive Cities 2009, *Evaluating Options for Water Sensitive Urban Design – A National Guide*, Canberra, available at: http://www.environment.gov.au/water/publications/urban/water-sensitive-design-national-guide.html
- Australian Government 2009, *Natural Resource Management Monitoring, Evaluation, Reporting and Improvement Framework*, Canberra, available at: http://www.nrm.gov.au/publications/frameworks/meri-framework.html
- Australian Government 2009, *Developing and Using Program Logic in Natural Resource Management*, Canberra, available at: http://www.nrm.gov.au/publications/books/meri-program-logic.html
- Australian National Audit Office 2006, *Implementation of Programme and Policy Initiatives Making Implementation Matter, Better Practice Guide*, Canberra, available at: http://www.anao.gov.au/uploads/documents/Implementation_of_Programme_and_Policy_Initiatives.pdf
- Victorian Auditor-General's Office (VAGO) 2008, *Performance Reporting in Local Government,* Melbourne, available at: http://www.audit.vic.gov.au/reports__publications/reports_by_year/2008/20080611_lg_performance.aspx
- UK Cabinet Office 2004, Prime Minister's Strategy Unit, *Strategy Survival Guide*, Version 2.1, London, pp. 83-84, available at: http://interactive.cabinetoffice.gov.uk/strategy/survivalguide/index.htm
- Facility for Advancing Water Biofiltration, June 2009, *Adoption Guidelines for Stormwater Biofiltration Systems*, pp.66-77. Monash University, available at: http://www.monash.edu.au/fawb/products/

Figure 9.2: City of Melbourne Performance Scorecard

WSUD Performance Ready Reckoner

TO TREAT 260 SQ. METRES OF ROAD RESERVE CATCHMENT	TO TREAT 780 SQ. METRES OF ROAD RESERVE CATCHMENT	TO TREAT 2500 SQ. METRES OF ROAD RESERVE CATCHMENT
1sq. metre of WSUD treatment = 1 small WSUD street tree pit = 26 kgs of TSS removed annually **= 1 POINT**	3sq. metre of WSUD treatment = 1 large WSUD street tree pit = 78 kgs of TSS removed annually **= 3 POINTS**	10sq. metre of WSUD treatment = 1 raingarden = 260 kgs of TSS removed annually **= 10 POINTS**
TO TREAT 1 HA OF ROAD RESERVE CATCHMENT	**TO TREAT 2500 SQ. METRES OF ROOF**	**TO TREAT 1000 SQ. METRES OF ROAD RESERVE CATCHMENT**
40 metres of WSUD treatment = 1 swale = 1290 kgs of TSS removed annually **= 50 POINTS**	1.3ML/year of roofwater reused = 100kl rainwater tank = 26 kgs of TSS removed annually **= 1 POINT**	30 sq. metre of WSUD treatment = porous pavers = 100 kgs of TSS removed annually **= 4 POINTS**
TO TREAT 5 HA OF CATCHMENT	**TO TREAT 5 HA OF CATCHMENT**	**TO TREAT 5 HA OF CATCHMENT**
1000 sq. metres of WSUD treatment = 1 small wetland = 2600 kgs of TSS removed annually **= 100 POINTS**	1 small wetland (100 points) + 7 ML/year stormwater reuse = 400 KL storage = 520 kg of TSS removed annually **= 20 POINTS** **IN TOTAL 120 POINTS**	Stormwater reuse 7ML/year = 400 KL storage = 2080 kgs of TSS removed annually **= 80 POINTS**

Source: Melbourne Water and City of Melbourne 2009, *Model WSUD Guidelines – Part 2 Getting WSUD on the Ground, Module 2.1,* p. 28.

Glossary

Business case: A document that forms the basis of advice for executive decision-making for an asset investment. It is a documented proposal to meet a clearly established service requirement. It considers alternative solutions, and identifies assumptions, benefits, costs and risks. (DTF 2008)

Capacity building: Enhancing the ability of individuals, groups and organisations to effectively, efficiently and in a sustainable manner achieve the desired outcomes. (adapted from Australian Government 2009)

Capital expenditure: Expenditure involved in creating or upgrading assets. (DTF 2008)

Catchment: The area of land contributing water flows from rainfall to a point on a drainage or river system.

Cost benefit analysis: Analysis which quantifies in monetary terms as many of the net effects of the costs and benefits of a proposal, including items for which the market does not provide a satisfactory measure of economic value. (HM Treasury)

Directly Connected Imperviousness: DCI is defined as the proportion of a catchment covered by impervious surfaces directly connected to a stream via stormwater pipes.

Diffuse source pollution: Passive diffuse source pollution results from natural processes or passive human behaviours throughout the catchment (e.g. driving motor vehicles is passive in that it is not purposefully polluting behaviour, but still results in heavy metals deposition throughout the catchment; atmospheric nitrogen deposition is a natural process but is a source of pollution in runoff from impervious surfaces). Active diffuse source pollution results from 'active' human behaviours throughout the catchment (e.g. litter pollution throughout the catchment is the result of people 'actively' or consciously disposing of litter in the street, sediment from building sites and toxicants from industrial premises are the result of people actively generating and discharging these pollutants to the stormwater system).

Effectiveness: The extent to which actual outcomes are achieved, in terms of the planned outcomes, via relevant outputs or administered items. (ANAO 2007)

Efficiency: The extent to which resources are minimised for a given level of outputs, or outputs are maximised for a given level of resources. (ANAO 2007)

Evaluation: In the WSUD context, a periodic assessment of the impact, appropriateness, effectiveness, efficiency and legacy of a policy, program or project to generate systematic information that can help improve performance.

Greywater: Wastewater from household laundries, bathrooms and kitchens that varies in quality from relatively clean to containing significant contamination including harmful microorganisms. (JSCWSC 2009)

Gross pollutant trap: A gross pollutant trap (GPT) is a structure used to trap large pieces of debris (>5mm) transported through the stormwater system. (Melbourne Water and City of Melbourne 2009)

Groundwater: Water collecting below ground level in an aquifer. (JSCWSC 2009)

Indicator: A quantitative or qualitative factor or variable that provides a simple and reliable basis for assessing the achievement, change or performance. It is a unit of information measured over time that can help show changes in a specific condition. A given goal or objective can have multiple indicators. (Australian Government 2009)

Input: The financial, human and material resources necessary to produce the intended outputs of a program or project. (Australian Government 2009)

Integrated water management (IWM): A whole-of-cycle approach to water resource management, considering the environmental, social and economic issues of a project. IWM incorporates adaptive management, participation and holistic approach to planning, development and implementation. (International Water Centre 2010)

Key performance indicator (KPI): A measure that has been selected to demonstrate that a benefit expected from an investment has been delivered. The KPI must be directly attributable to the investment. (DTF 2008)

Life cycle assessment: Life-cycle assessments (LCAs) involve cradle-to-grave analyses of production systems or processes. (Melbourne Water and City of Melbourne 2009)

Monitoring: The regular collection and analysis of information to assist timely decision making, ensure accountability and provide the basis for evaluation and learning. It is a continuing function that uses collection of data to provide management and the main stakeholders of an ongoing project or program with early indications of progress and achievement of objectives. (Australian Government 2009)

MUSIC: An acronym used for the Model for Urban Stormwater Improvement Conceptualisation software developed by the Cooperative Research Centre for Catchment Hydrology to model urban stormwater management schemes. (Melbourne Water and City of Melbourne 2009)

Multi-criteria analysis: A technique that involves assigning weights to criteria, and then scoring options in terms of how well they perform against those weighted criteria. Weighted scores are then summed, and can then be used to rank options. (HM Treasury)

Objective: The high-level action (or strategic intervention) that is proposed as the response to the identified driver. This intervention must be framed within the context of the organisation's purpose. (DTF 2008)

Options analysis: A process in which a range of options (both asset and non-asset) are evaluated. The most cost-effective options are then selected for more detailed evaluation. (DTF 2008)

Outcomes: The results or impacts on the community or the environment that the Government intends to achieve. (ANAO 2007)

Outputs: The actual deliverables produced to generate the desired outcomes specified by Council. (ANAO 2007)

Participation: One or more processes in which an individual or group takes part in specific decision making and action, and over which they may exercise specific controls. It is often used to refer specifically to processes in which primary stakeholders take an active part in planning and decision making, implementation, learning and evaluation. (Australian Government 2009)

Point source: Discharge to receiving waters from a single point, such as pipe or drain. Point sources of pollution enter receiving water at a discrete, identifiable location and can be measures (Fletcher and Delectic, 2006)

Potable water: Potable water is water suitable for drinking purposes. It is assigned as potable on the basis of water quality standards. It is provided to householders through a reticulated water distribution network. (Melbourne Water and City of Melbourne 2009)

Proposal: An idea for a policy, program or project that is under development. (DTF 2008)

Raingarden: A constructed vegetation system that filters polluted stormwater through a vegetated filter media layer. Water is treated and released to a receiving water body (e.g. waterway, drain, groundwater) or to storage for reuse. Raingardens are also referred to as bioretention systems. Raingardens can be designed in all shapes and sizes, and can combine an infiltration function. (adapted from Melbourne Water and City of Melbourne 2009)

Rainwater harvesting: The collection and storage of rainfall from household roofs for reuse to provide a water resource. (Melbourne Water and City of Melbourne 2009)

Recycled water: Wastewater that has been treated to a level suitable for further use, where it is used safely and sustainably for beneficial purposes. This is a general term that can include reclaimed water. (JSCWSC 2009)

Retention basin: A type of basin that is used to contain stormwater runoff. A retention basin provides an area to hold water from a small surrounding drainage area that would otherwise flow into other areas. This is opposed to a detention basin, which holds water for a limited period of time from a larger basin area to prevent flooding and releases all the water contained over a period of time. (JSCWSC 2009)

Risk assessment: A risk assessment is the overall process of using available information to predict how often hazards or specified events may occur (likelihood) and the magnitude of their consequences (adapted from AS/NZS 4360:2008).

Sewer mining: The process of extracting sewage from a sewerage system and treating it to produce recycled water for a specific end use. (Melbourne Water and City of Melbourne 2009)

Stakeholder: An agency, organisation, group or individual who has a direct or indirect interest in a project or program, or who positively or negatively affects or is affected by the implementation and outcome of it. (Australian Government 2009)

Stormwater: Rainfall runoff from urban areas defined as the net increase in runoff and decrease in groundwater recharge from the increase in impervious surfaces, such as roofs and roads that occur within urban development. (adapted from the Central Region Sustainable Water Strategy, Victorian Government, 2006)

Stormwater harvesting: Rainfall that runs off impervious surfaces and is collected and stored for subsequent use. This water can carry a wide range of contaminants, including oil from roads, nutrients, pathogens and heavy metals. (JSCWSC 2009)

Suspended solids: Suspended solids refer to small solid particles which remain in suspension in water. It is used as one indicator of water quality, along with nitrogen and phosphorous. Particles can be removed by sedimentation or filtration. (Melbourne Water and City of Melbourne 2009)

Target: A quantifiable performance level or change in level to be attained by a specified date. (ANAO 2007)

Wastewater: Any water which has been used at least once and cannot be used again without being treated. Treated wastewater can often be used for recycling purposes depending on the level of treatment undertaken. (JSCWSC 2009)

Water balance: A mass balance accounting for water entering, accumulating and exiting a system. It includes rainwater, potable mains water, evapotranspiration and infiltration, wastewater and stormwater. (Melbourne Water and City of Melbourne 2009)

Water demand management: An approach to reducing the consumption of water. This includes educating people about how to save water, promoting the use of water efficient household and industrial appliances, such as dual-flush toilets, and putting a price on water that reminds people of its true value. (Melbourne Water and City of Melbourne 2009)

Water sensitive urban design (WSUD): Embraces a range of measures that are designed to avoid, or at least minimise, the environmental impacts of urbanisation. WSUD recognises all water streams in the urban water cycle as a resource. Rainwater (collected from the roof), stormwater (collected from all impervious surfaces), potable mains water (drinking water), greywater (water from the bathroom taps, shower, and laundry) and blackwater (toilet and kitchen) possess an inherent value. (Melbourne Water and City of Melbourne 2009)

In these Guidelines, WSUD is used in its broadest meaning, and as such WSUD measures could be also called integrated water management measures, and encompass stormwater treatment systems, such as wetlands and raingardens, as well as water saving and water harvesting systems (for example, rainwater tanks).

Water quality: The physical, chemical and biological characteristics of water in relationship to a set of standards. Water quality standards are created for different types of water bodies and water body locations per desired uses. The primary uses considered for such characterization are parameters which relate to drinking water, safety of human contact, and for health of ecosystems. (JSCWSC 2009)

Water recycling: The multiple use of water, usually sourced from sewerage or stormwater systems, that is treated to a standard appropriate for its intended use. (JSCWSC 2009)

Wetland: A transitional area between land and water systems which is either permanently or periodically inundated with shallow water. Constructed surface wetlands use enhanced sedimentation, fine filtration and biological uptake processes to remove pollutants from storm water. Subsurface wetlands are a complex assemblage of water, soils, microbes, plants, organic debris and invertebrates where water flows through the soil. The soil is highly permeable and contains gravel and coarse sand. (adapted from Melbourne Water and City of Melbourne 2009)

Glossary References

- Australian Government 2009. Natural Resource Management Monitoring, Evaluation, Reporting and Improvement Framework, Canberra.
- ANAO 2007. Application of the Outcomes and Outputs Framework, Canberra.
- DTF (Victorian Department of Treasury and Finance) 2008. Investment Lifecycle Guidelines, Melbourne.
- Fletcher and Delectic, 2006. A review of Melbourne Water's Pollutant Loads Monitoring Program for Port Phillip and Westernport. Melbourne, Melbourne Water Corporation.
- HM Treasury, no date. The Green Book, Appraisal and Evaluation in Central Government, London.
- JSCWSC (Joint Steering Committee for Water Sensitive Cities) 2009. Evaluating Options for Water Sensitive Urban Design – A National Guide, Canberra.
- Melbourne Water and City of Melbourne 2009. WSUD Guidelines – Applying the Model WSUD Guidelines, Melbourne.
- Victorian Government, 2006. Central Region Sustainable Water Strategy, Melbourne.

Appendices

Appendix A2.1: Sample brief for undertaking an integrated water and pollutant balance

Note: this sample brief for undertaking an integrated water and pollutant balance is from the Brimbank Sustainability Water Management Strategy Request for Quotation (2010). Various tasks contained within the brief may need to be adapted to meet an individual council's specific requirements.

Water and Pollutant Budgets and Baseline Profile

Project tasks

i. Quantify potable water, waste water and stormwater flows, together with infiltration, evapotranspiration and status of groundwater. Ensure delineation of the environment's, council's, residents', and other sectors' share of water resources.

ii. Review GIS and LIDAR data held by Brimbank City Council and Melbourne Water, including impervious fraction mapping.

iii. Review drainage, sewerage and groundwater mapping and data and related activities.

iv. Calculate pollutant generation and flows in the urban catchment, for roads, roofs, and other impervious areas and pervious areas, accounting for evapotranspiration and infiltration losses and prioritising municipality sub-catchments by load (using Fletcher data for modelling).

v. Describe any WSUD projects occurring in neighbouring municipalities that impact on 'city as a catchment' modelling for the City of Brimbank.

vi. A preliminary report is to be provided: setting out methodology, results and diagrams for establishing the water and pollutant budgets. This report is also to identify strategic opportunities to treat or reuse water and their associated risks and energy use.

This review and analysis will form part of the final Water Strategy document for the purposes of adding depth to understanding of water cycle and consumption patterns in the City of Brimbank.

Source: Brimbank City Council 2010, *Request for Quotation Preparation of Brimbank City Council Sustainable Water Management Strategy.*

Appendix A2.2: Event mean concentrations for different surfaces

The following table provides storm flows concentrations for a roads, roofs, other impervious (general urban) and pervious (rural) surfaces.

Storm flows (or wet weather, event) mean concentrations (mg/L)			
	Total Suspended Solids (TSS)	Total Phosphorus (TP)	Total Nitrogen (TN)
Music Default	158.5	0.35	2.63
roads	270	0.5	2.2
roofs	20	0.13	2
other impervious (general urban)	140	0.25	2
pervious	90	0.16	1.45

Source: adapted from Fletcher, T. et al. 2004, *Stormwater Flow and Quality, and the Effectiveness of Non-Proprietary Stormwater Treatment Measures – A Review and Gap Analysis*. CRC for Catchment Hydrology Report 04/8. A broader range of surfaces is presented in the report (see tables 2.43 – 2.51) which can be accessed on the web at: http://www.catchment.crc.org.au/pdfs/technical200408.pdf; and Benchmark Environmental Consulting, February 2007. SEPP compliance scenarios for the application of WSUD in Gardiners Creek - Final Report. ABN 82 806 239 590

The default values of event mean concentrations for Total Suspended Solids (TSS), Total Phosphorus (TP) and Total Nitrogen (TN) adopted in MUSIC are based on a comprehensive review of stormwater quality in urban catchments was undertaken by Duncan (1999).[1,2]

Appendix A3.1: Components of a vision statement

Good vision statements have common components:

- It is written in the present, not future tense. They describe what council will feel, hear, think, say and do as if council had reached its water management vision now.
- It is summarised with a powerful phrase that can form the first paragraph of the vision statement. The phrase can be repeated in whatever communication mediums you have to trigger memory of the longer statement.
- The vision statement describes the best outcome that a council can achieve in relation to water management. It should not confuse a vision with the objectives of a council for a particular period of time. A vision statement, therefore, does not provide numeric measures of success.
- A vision statement should use unequivocal or plain language. It should not use business speak or words like maximise or minimise.
- It should evoke emotion. It should be obviously and unashamedly passionate.
- It helps build a picture in stakeholders' minds.

Source: adapted from Change Factory 2008, *Components of a good vision statement*.

See: http://www.changefactory.com.au/articles/article_199.shtml

1 Duncan, H. P. (1999). Urban Stormwater Quality: A Statistical Overview. Melbourne, Australia, Cooperative Research Centre for Catchment Hydrology. 80.

2 Manual for MUSIC V4, 2009. MUSIC Development Team

Appendix A3.2: Information on strategic context

A range of federal and state initiatives, strategies, policies and plans will influence council water management.

Federal initiatives

National Water Initiative – the National Water Initiative (NWI) is Australia's blueprint for water reform. Through it, governments across Australia have agreed on actions to achieve a more cohesive national approach to the way Australia manages, measures, plans for, prices, and trades water.

Innovation and Capacity Building to Create Water Sensitive Australian Cities

Section 92. The Parties agree to undertake the following actions in regard to innovation:

i) develop national health and environmental guidelines for priority elements of water sensitive urban designs (initially recycled water and stormwater) by 2005;

ii) develop national guidelines for evaluating options for water sensitive urban developments, both in new urban sub-divisions and high rise buildings by 2006;

iii) evaluate existing 'icon water sensitive urban developments' to identify gaps in knowledge and lessons for future strategically located developments by 2005;

iv) review the institutional and regulatory models for achieving integrated urban water cycle planning and management, followed by preparation of best practice guidelines by 2006; and

v) review of incentives to stimulate innovation by 2006.

Web: http://www.nwc.gov.au/www/html/117-national-water-initiative.asp

Water for the Future – the Australian Government's framework provides national leadership in water reform for all Australians. *Water for the Future* is built on four key priorities: taking action on climate change; using water wisely; securing water supplies; and supporting healthy rivers.

Web: http://www.environment.gov.au/water/australia/index.html

State White Papers, strategies and plans

State White Papers

Securing Our Water Future Together – the 2004 White Paper sets out 110 initiatives for water conservation aimed at every sector of the community, seeking to provide water to sustain growth over the next 50 years. The next stage of the Government's Water Plan (2007) provides long-term solutions to secure water supplies by building a desalination plant, saving water through upgrading irrigation channels, expanding the Water Grid to pipe water around the State, and extending conservation programs and recycling.

Securing Our Natural Future: A White Paper for Land and Biodiversity at a Time of Climate Change (2009) – the Land and Biodiversity White Paper is a long-term, strategic framework to secure the health of Victoria's land, water and biodiversity in the face of ongoing pressures and a changing climate over the next fifty years.

Taking Action for Victoria's Future, Victorian Climate Change White Paper - The Action Plan (2010) – outlines an action plan with ten new actions to reduce Victorian emissions; capitalise on new jobs, new technologies and new markets; and adapt to a changing climate.

State strategies and policies

Central Region Sustainable Water Strategy (2006) – a plan to secure water supplies for homes, business, industry, agriculture and the environment for the next 50 years.

Victorian River Health Strategy (2002) (under review) – to provide: a common vision for the management of rivers in Victoria; statewide targets for river restoration; a planning framework; criteria for priority setting for investment; an overview of government policy; environmental flows and water allocation; and the institutional arrangements for the management of river health. The Strategy will be renewed in early 2011 to include an innovative integrated approach to managing rivers and wetlands.

Port Phillip and Western Port Regional Catchment Strategy (2004) – describes the natural assets of the region, and how they are interrelated. It outlines what needs to be done to manage and use the assets in a sustainable way.

Port Phillip and Western Port Region Flood Management and Drainage Strategy (2007) – defines five flood management objectives and outlines actions that will be undertaken to achieve each objective and guide priorities and expenditure by Melbourne Water.

Better Bays and Waterways Plan (2010) – developed by Environment Protection Authority Victoria and Melbourne Water, the Plan outlines more than 90 actions to improve Melbourne's bays and waterways.

State Environment Protection Policy (Waters of Victoria) 2003 – the purpose of the Policy is to help achieve sustainable surface waters by: setting out the environmental values and beneficial uses of water that Victorians want, and the environmental quality required to protect them; and setting, within a 10 year timeframe, goals for protection agencies, businesses and communities and means by which they can be met.

Victoria Planning Provisions 1987 – provide a clear and consistent framework within which decisions about the use and development of land can be made; to express state, regional, local and community expectations for areas and land uses; and to provide for the implementation of State, regional and local policies affecting land use and development.

Melbourne 2030 (2002) – a 30-year plan to manage growth and change across metropolitan Melbourne and the surrounding region. *Melbourne @ 5 million* (2008) is an update of *Melbourne 2030* in the light of rapid population growth.

Local Strategies and Plans

Council Plan – the Local Government Act 1989 requires councils to develop formal Council Plans and Strategic Resource Plans to address the medium term needs of the community. The Act also requires each council to adopt an annual budget for each financial year.

Municipal Strategic Statement (MSS) – the MSS is the foundation of the strategic planning framework and provides the basis for planning decisions in a municipality.

Appendix A4.1: WSUD implementation targets and incentives

There are a range of incentives that can be offered by councils to support and facilitate the uptake of WSUD. Examples of the range of incentives that councils may consider include[3]:

- Financial incentives, such as rebates for the installation of rainwater tanks or water efficient appliances. Financial incentives can also include discounts on other council charges (for example, a development or stormwater service charge) if a residential or commercial property has installed WSUD elements.
- Non-financial incentives, such as additional floor space provisions or open space credits for developers that adopt WSUD, can encourage the incorporation of WSUD elements into developments.
- Assistance programs could be used to provide free technical advice, construction support or materials to install WSUD elements.
- Educational programs, such as WSUD kits or free workshops (for example, a how-to-install WSUD elements workshop), could be offered by councils to complement other WSUD incentives and foster community behavioural changes.

Incentives for WSUD can complement associated regulations (e.g. Clause 56) and assist councils in the achievement of WSUD implementation targets.

An example of a WSUD incentive can be found with the City of Ryde in New South Wales. Under the *2008 Ryde Local Environment Plan*, council "may consider granting development consent to a development where the building height and the Floor Space Ratio are in excess of the controls contained in the Ryde Planning Ordinance if the development provides community benefits, such as:

- treatment and/or other features in public places;
- environmental management improvements such as water and energy minimising devices; and
- water quality devices".[4]

The incentive floor space provisions complement the City of Ryde's broader WSUD policy and planning provisions.

Councils may be able to use the permeability objectives in Cl 54.03 and Cl 55.03 of the Victorian Planning Provisions to similar effect.

As another example, in Sydney, Marrickville Council's *Rainwater Tank Rebate Program* is available to all ratepayers, residents and businesses in the municipality. It is funded from the Marrickville *Stormwater Management Service Charge*. Council encourages the installation of rainwater tanks to protect local waterways and to manage precious water resources. The rebate is based on the volume of the tank(s) installed and how the water is used, and the standard rebate pays up to $2,000. Council's rebate scheme is in addition to the rebates offered by Sydney Water and the Australian Government.[5]

3 For further information, see: http://www.wsud.org/tools-resources/wsud-incentives/

4 From the City of Ryde Local Environment Plan Amendment 1. For further information, see: http://www.ryde.nsw.gov.au/home.htm

5 For further information, see: http://www.marrickville.nsw.gov.au/marrickville/internet/me.get?site.home&page1987

Appendix A5.1: The policy development process

The policy development process for establishing water objectives and WSUD implementation targets will involve a series of key steps:[6]

1. **Policy identification** – consider current council water management policies, any gaps with respect to WSUD, is a policy required to guide actions? Does council currently have required water management policies in place?
2. **Determine the objective(s) of the WSUD policy** – why does council need this particular policy and what is the WSUD problem? What is the aim of the WSUD policy? This may be a short, medium or long-term objective depending on council's existing policies and work undertaken to date.
3. **Research and analysis** – this will involve gathering relevant information relating to water management and WSUD, such as undertaking a water balance and pollutant budget. This may include reviewing existing State and Federal water quality and water management strategies and plans, and sample policies from other councils.
4. **Development of a draft Policy** – a draft Policy should include a purpose, rationale, context, the policy and an evaluation process – refer to Box A5.1 for a detailed outline of a Policy document.
5. **Review the draft Policy** – copies of the draft Policy should be circulated for comment to relevant stakeholders, including management, stormwater and water management staff, councillors and external authorities. *See Section 8 for guidance on stakeholder engagement*.
6. **Collate responses** – it is important that responses and suggestions from stakeholders are collated, to assist in determining what changes/additions should or should not be made to the draft WSUD policy.
7. **Develop final draft** – write the final draft WSUD policy using a relevant council template and incorporating council's logos. Pay extra attention to the use of correct spelling, grammar and content.
8. **Endorsement** – the policy should be endorsed by the relevant managers and councillors, verifying the authenticity of the WSUD policy. Copies of the WSUD policy should be made available to stormwater management and water management staff, with an explanation of any consequent changes to stormwater and water management practices.
9. **Implementation** – the WSUD policy is put into practice.
10. **Review** – policies should be reviewed regularly to accommodate changes in stormwater and water management practice, legislation, standards and current trends. This requires the need to stay up-to-date with current information.

Preparing a WSUD Policy Document

When preparing a WSUD policy document, core aspects that a council will need to consider include the purpose (or intention) of the policy, scope, context and background, responsibilities, the policy statement itself, and an evaluation process and review date. A policy document should be brief, and written in plain English. Core elements of a WSUD policy document are outlined in Box A5.1.

6 Adapted from Children's Services Central, *Effective Policy Development*, Sydney.

Box A5.1: What Should a Policy Document Include?

A WSUD policy document should include the following core elements:

- **Purpose** – a brief, clear and direct explanation of what the WSUD policy is intended to achieve and who the intended audience is. The purpose should be linked to the core elements of WSUD: water supply, water quality, water quantity, function and amenity.
- **Rationale** – a reference to relevant legislation, standards and guidelines that provide authority for the WSUD policy statement.
- **Scope** – to who and what does the WSUD policy apply, where the policy will have effect and what value will the WSUD policy add.
- **Context** – brief discussion of the background and context which the policy will operate within, including council's existing WSUD practices, and connections with State and National directions and guidelines. See Section 3 for further information on the need to consider the strategic context and background.
- **Principles** – a description of council's principles that have helped shape development of the WSUD policy.
- **Responsibility** – who are those responsible within council for implementing the policy and what is expected of them?
- **Policy statement** – the policy itself.
- **Evaluation process** – a description of the way in which the impact of policy will be assessed and measured, and a timeline for this. *See Section 9 for guidance on the Monitoring, Evaluation and Reporting process*.
- **Review date** – a date for review of the WSUD policy.
- **Document and version control** – the document and author name version, sign-off and publication date. Be consistent with existing council policy documents.
- **Contacts, supporting tools and resources** – a policy document should, as a minimum, include a contact person who can assist with inquiries about the WSUD policy and any other supporting WSUD tools or materials that will assist with understanding and implementation of the policy.

Source: adapted from Althaus et al 2007, *The Australian Policy Handbook, Sydney; An internal guide to policy making; and Department of Education and Children's Services, see www.decs.sa.gov.au/policy*

When writing the draft policy document, the following questions should be considered:

- Who am I writing for? Keeping the audience in mind helps to ensure that the language remains simple.
- What am I trying to say? Make sure the message regarding WSUD and water management is clear and to the point.
- Is the writing style consistent with existing council policies? You want all policies to be consistent in style, layout and language.
- What should be done to make sure the WSUD policy is implemented? What strategies and procedures need to be put in place to implement the policy?

When seeking stakeholder input on the policy document, it is important to remember that this can be achieved in a number of ways. This could be achieved through general discussions in meetings, through a survey, or distributing draft copies and seeking direct input. When considering suggestions and additions to the draft policy from stakeholders, it is important to remember that reaching a consensus may not be easy, as there may be times when what is considered a priority, goal or 'best practice' will differ between stakeholders.

Appendix A5.2: Key components of selected WSUD strategies and plans

Box A5.1: Selected Strategies and Plans with WSUD Implementation Targets

Melbourne City as a Catchment Strategy 2009	Port Phillip Water Plan 2010	Knox WSUD and Stormwater Management Strategy 2010
Vision: *Total Watermark – City as a Catchment* is based on the vision of a 'water sensitive city' where water sensitive urban design (WSUD) techniques conserve, re-use and recycle water, and manage the quality of stormwater runoff	**Vision:** The City of Port Phillip supports a 'water sensitive city' which reflects an integrated approach to the management of all water sources	**Vision:** The WSUD will contribute to a more liveable, sustainable and productive municipality
Purpose: The purpose of a 'water sensitive city' approach is to implement best-practice water sensitive urban design (WSUD) techniques to conserve, re-use and recycle water, and manage the quality of stormwater runoff	**Seven broad objectives:** › review the Local Action Plan 2005 and council's current approach to water management › clarify current and future water management challenges and issues of relevance to council › provide a water and pollutant balance for the municipality › outline a vision and principles for integrated water management, including potable water, stormwater, wastewater and groundwater › set targets for integrated water management across all water sources › outline an Integrated Water Management Program of council and community actions, incorporating regional and local partnerships › outline elements of program support including water project accounting, program monitoring, capacity building and communications planning.	**Aim:** Two main aims of the Strategy are to: 1. present a rigorous, informed framework for implementing WSUD actions in a way that maximises the benefits to the community and the environment while minimising costs 2. Develop an effective and efficient maintenance framework for council's WSUD assets, so that its investment in WSUD are protected and worthwhile in the long-term
Fundamental attributes for implementing a 'water sensitive city are: 1. access to a diversity of water sources (both centralised and decentralised) 2. provision of ecosystem services for the built and natural environment 3. community engagement (socio-political capital for sustainability)	**Principles of Integrated Water Management** cover: - protect and improve: to improve the quality of stormwater and ensure the protection of receiving waters and other environment values - harvest and conserve: harvest alternative water sources and apply ongoing demand management strategies - think fit for purpose: match the quality of alternative water sources with the quality required e end use, to minimise treatment, and ensure supply, storage and users are close together - engage and jointly manage through community partnerships	Not explicit

Box A5.1: Selected Strategies and Plans with WSUD Implementation Targets

Melbourne City as a Catchment Strategy 2009	Port Phillip Water Plan 2010	Knox WSUD and Stormwater Management Strategy 2010
Alternative Water Source Hierarchy: *Alternative water sources from within the catchment* 1. undertake water demand reductions 2. consider rainwater harvesting 3. consider stormwater harvesting 4. consider water recycling *Alternative water sources from beyond the local catchment* 5. Wastewater conveyed along the Melbourne Water sewerage transfer network 6. Stormwater in the Yarra River, Maribyrnong River and Moonee Ponds Creek 7. mains water 8. groundwater	Water Management Hierarchy: *Hierarchy that guides council in the implementation of water projects based on the beneficial uses and potential impacts forecast* 1. Reduce demand for water 2. Reuse existing water 3. Recycle wastewater 4. Source water from beyond the municipal catchment	Not explicit
Water Cycle Management Targets: - water savings - alternative water use - stormwater quality - wastewater reduction - groundwater quality	**Targets** cover: - water conservation - stormwater quality improvement - alternative water sources	**Targets** cover: 1. High-value catchments program 2. Hotspots program 3. Opportunistic program 4. Planning program 5. Maintenance program 6. Evaluation and reporting

Box A5.1: Selected Strategies and Plans with WSUD Implementation Targets

Melbourne City as a Catchment Strategy 2009

Action plan to achieve sustainable water management targets

WSUD projects for council-managed assets:

1. Parks - demand reductions
2. Buildings - demand reductions
3. Parks - alternative water sources
4. Parks - water saving offsets
5. Streetscapes and parks - stormwater treatment
6. Buildings - alternative water sourcing

WSUD projects for the commercial sector:

7. Commercial business - demand reduction
8. Commercial business on large sites - alternative water sources and WSUD treatment
9. Commercial business on smaller sites - alternative water sources

WSUD projects for the residential sector:

10. Residential - demand reduction
11. Residential - alternative water sources.

Port Phillip Water Plan 2010

Strategies cover:

1. institutionalise water sensitive urban design within council
2. continue to implement water efficiency for parks, gardens and facilities
3. increase application of water sensitive urban design to roads, drainage and streetscape works
4. implement stormwater harvesting for open space
5. facilitate the application of water sensitive urban design by the community.

Knox WSUD and Stormwater Management Strategy 2010

Strategy priority areas:

1. High-value catchments program
2. Hotspots program
3. Opportunistic program
4. Planning program
5. Maintenance program
6. Evaluation and reporting

WSUD Objectives:

High-value catchments program

1. Waterways are protected and rehabilitated towards pre-development waterway characteristics. To be done through the disconnection of directly connected impervious surfaces
2. Directly connect impervious surfaces to waterways are disconnected via appropriate WSUD treatments.
3. WSUD systems are built in locations that maximise their environmental, social and economic benefits to the community.

Hotpot program

4. Direct illegal discharge of pollutants into waterways is minimised through education, enforcement & interception systems

Opportunistic program

5. WSUD systems are functional by ensuring that they are designed, constructed and maintained correctly and to 'best practice' standards

Planning program

6. Ensure that there is appropriate regulatory power and structure to enforce on and educate the community to construct WSUDs and to understand their effect on waterways.

Evaluation and reporting

7. Ensure that there is reporting and monitoring on the effect of WSUD systems on stormwater quality in Knox's waterways

Note: Some sections of the council strategies and plans have reordered for comparative purposes.

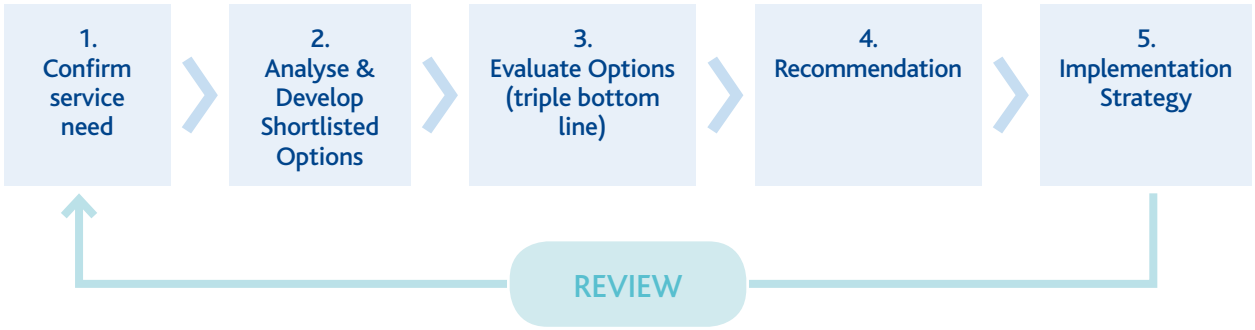
Appendix A7.1: How to develop a business case

There are five key elements to consider when developing a business case. These are[7]:

- confirm the business need
- analyse and develop options
- evaluate the financial and non-financial benefits of options
- provide a recommendation of the preferred options, and
- outline implementation of the policy or project.

Figure A7.1 illustrates the five key elements to consider when developing a business case.

Figure A7.1: Business case key elements[8]



Confirm the business need

It is important that the stated WSUD business (or service) needs are real and fit within council's wider strategic urban water management strategic objectives. If council already has a defined strategic WSUD policy, there should be a clear link to the council's WSUD policy and the proposed project.

When preparing the business case, it is important to check that WSUD investment proposals' align with council's current WSUD and urban water management objectives and priorities. If possible, investment proposals should also be tested against relevant State and National policies, targets and best practice guidelines.

Analyse and develop short-listed options

It is generally appropriate to consider two to three alternative options in any business case, including a do-nothing option. The short-listed options should be reviewed, and the business case should document and test the major assumptions and constraints that surround each option. The assumptions and sources of information underlying the analysis are vital to establishing the required credibility and rigour of the business case.

7 Department of Treasury and Finance 2008, *Investment Lifecycle Guidelines*, Melbourne.

8 Adapted from Department of Treasury and Finance 2008, *Investment Lifecycle Guidelines*, Melbourne.

Evaluate to determine the preferred option

The business case should involve an appropriate evaluation of the economic (including financial), social and environmental benefits of the short-listed options (commonly referred to as Triple-Bottom-Line analysis).

Useful resources are available on the Lifecycle Guidance Material section of the Department of Treasury and Finance (DTF) website www.lifecycleguidance.dtf.vic.gov.au and Melbourne Water's Triple Bottom Line Guidelines.

Recommendation

The business case should describe the preferred WSUD option and rationale for the recommendation, including:

- major features of the preferred WSUD option;
- scope;
- economic and financial analysis, including key assumptions;
- social and environmental analysis, including key assumptions;
- council budget analysis, and funding strategy (including sources of funding);
- performance measures; and
- key policy or project implementation issues, including risk management.

Implementation strategy

Officers developing business cases need to outline the key features and steps to implement the preferred option. This will include a discussion on any level of uncertainty, and how council plans on managing any risk. As noted above, other requirements for the WSUD business case document include the:

- management and governance structure;
- scheduled targets and outcomes, and key deliverables;
- monitoring and reporting proposed;
- approval requirements and timelines;
- funding sources and procurement strategy;
- performance targets;
- stakeholder management and communication strategy; and
- key risks and management strategies.

9 See: http://www.lifecycleguidance.dtf.vic.gov.au

Business case structure

The following business case structure has been developed to be consistent with the Victorian Government's *Investment Lifecycle Guidelines*[9]. Not all elements outlined in the *Investment Lifecycle Guidelines* will be relevant to councils. A business case of appropriate scope and detail for councils seeking to establish or extend WSUD funding may be in the order of six to ten pages.

Box A7.1: Business case structure

1. **Executive summary** – a vital standalone part of the Business Case. It should outline objective, scope, analysis, and recommended option.
2. **Description of program need** – detail the business or service need, and the drivers for the WSUD policy or project, e.g. why rainwater gardens need to be installed.
3. **Program description** – outline expected outcomes, policy or project objectives, anticipated benefits, critical success factors, and required funding
4. **Strategic alignment** – highlight alignment with existing council policies and strategic objectives, and State and National guidelines and targets.
5. **Stakeholders** – identify stakeholders, funding partners and potential impacts for beneficiaries, consultation processes, and level of support
6. **Options analysis** – present summary of 2 or 3 options, with two options most likely to deliver desired WSUD outcomes, and the "do nothing" or minimal case. Benefits, costs and consequences of each option should be clearly identified.
7. **Key assumptions** – document critical assumptions or constraints.
8. **Social and environmental analysis** – provide an analysis of social and environmental outcomes of proposed WSUD policy or project.
9. **Economic and financial analysis** – outline the operating and capital expenditure required for each option. Identify all sources of revenue and expenses.
10. **Risk analysis** – identify any material risks to with the WSUD proposal.
11. **Program implementation** – outline the implementation plan and procedures to support program delivery, resourcing, monitoring and evaluation.
12. **Preferred option recommendation** – clearly communicate the preferred option, along with reasons for the recommendation.
13. **Signoff** – the primary author of the Business Case should be identified and sign it off. Sign off will also be required from relevant council staff, for example, Chief Financial Officer.
14. **Supporting documentation** – include any supporting documentation referenced or used in the development of the Business Case as an appendix.

Source: adapted from Victorian Department of Treasury and Finance, *Investment Lifecycle Guidelines*, Melbourne. See: http://www.lifecycleguidance.dtf.vic.gov.au/

Appendix A8.1: Engagement processes and key steps

This appendix provides general guidance on engagement processes and key steps to inform development of WSUD implementation targets, and WSUD programs and specific projects.

Thinking strategically about engagement

At the onset of thinking about stakeholder engagement, it is important to strategically consider:

- what is the purpose of the WSUD engagement:
  - what WSUD issues need to be clarified in specific terms for council and stakeholders
  - what information or response is required
- which stakeholders to engage:
  - identify and prioritise internal and external stakeholders
  - identify stakeholders' expectations and develop a profile for key stakeholders, and
  - consider council's typical approach to engagement and what approaches are encouraged or discouraged.

It may be useful to identify and map stakeholders depending on their particular responsibilities, influence and interest, for example, as illustrated in Figure A8.1.

It will be important to consider existing council engagement processes, and where possible align with these, to avoid duplication with engagement in developing WSUD implementation targets.

Planning for engagement

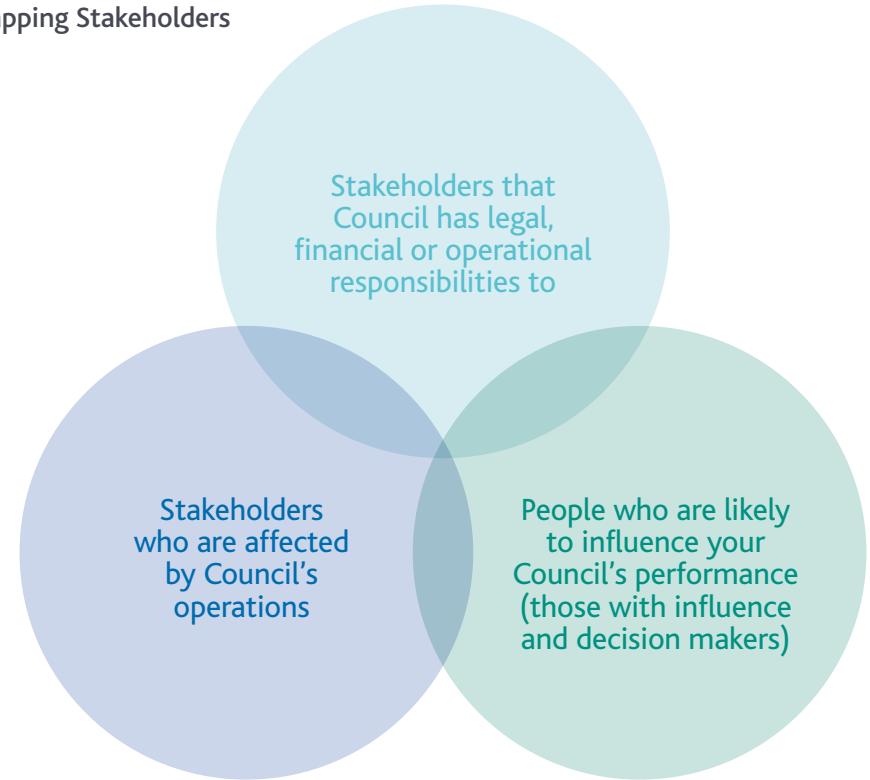
The key to a successful engagement exercise is effective planning and it is essential that this precedes the selection of any engagement techniques. Good planning will help ensure the selection of engagement techniques is based on achieving the purpose of the engagement and ultimately assist with effectively engaging stakeholders to support WSUD implementation targets.

Planning for engagement on WSUD implementation targets will include:

- setting stakeholder engagement objectives
- assessing what council resources and capability are available, and
- considering risk, legal implications, political perspectives, etc.

The International Association for Public Participation (IAP2) identifies and defines various levels of community engagement (see Box A8.1). There is increasing levels of stakeholder engagement and interaction from the inform level to the empower level. The first four levels of engagement are directly relevant to developing WSUD implementation targets.

Figure A8.1: Mapping Stakeholders



Box 8.1 Levels of Engagement

LOW INVOLVEMENT — HIGH INVOLVEMENT

INFORM	CONSULT	INVOLVE	COLLABORATE	EMPOWER

Inform: Largely a one-way communication process providing balanced and objective information to assist stakeholders understand problems, alternatives, opportunities and/or solutions.

Consult: Two-way interactive communication process designed to obtain feedback about rationale, analysis, alternatives and/or decisions.

Involve: Participatory process designed to help identify stakeholder issues and views to ensure that concerns and aspirations are directly reflected in the alternatives developed and to provide feedback on how stakeholder input influenced the decision.

Collaborate: Collaborative process to promote joint understanding of stakeholder issues and interests and to develop alternatives and identify preferred solutions and incorporate advice and recommendations in decisions.

Empower: Placing final decision making with stakeholders (unlikely to fully occur within a council governance framework).

Source: adapted from International Association for Public Participation 2004.

Strengthening engagement capabilities

Depending on the capabilities of individual WSUD officers, it may be helpful to consider strengthening engagement capabilities with appropriate training and mentoring. Seeking early advice and assistance from a council engagement team on the engagement process is strongly recommended.

It can also be valuable to consider how to strengthen the capability of stakeholders to more effectively engage and contribute to development of WSUD implementation targets.

Engagement design and techniques

The design of an engagement process seeks to match the engagement purpose and available resources for engagement with stakeholder characteristics. Preferred engagement techniques will vary across councils, catchments, communities, and the extent of progress with WSUD initiatives.

The selection of an engagement technique or method will be influenced by many factors including:

- Council WSUD objectives: the engagement technique chosen should:
  - help establish the kind of relationship the council wants with stakeholder(s), and
  - generate the WSUD outcomes the council wants
- Council resources: the council needs to have the resources, time and skills to apply the engagement method to further WSUD outcomes
- Stakeholder characteristics: the engagement technique needs to work for the stakeholders that the council wants to engage with, and the approach should be appropriate for the number of people that need to be involved
- Relationship context: the choice of engagement method should consider:
  - the council's current relationship(s) with the stakeholders as this may make a higher-level engagement approach applicable (e.g. collaboration), and
  - whether the council has known the stakeholders long enough for a higher-level approach to work.

Selected engagement techniques that could assist the development of WSUD implementation targets are identified in Table A8.1.10.

10 For further information on different engagement techniques see Department of Sustainability and Environment 2005, *Book 3, The engagement toolkit*, and AccountAbility, the United Nations Environment Programme, and Stakeholder Research Associates 2005, *The Stakeholder Engagement Manual*. Table adapted from Queensland Department of Main Roads 2005, *Community Engagement*.

Table A8.1: Selected engagement techniques for WSUD implementation targets

Key WSUD engagement question	Potential engagement techniques		
Do you need to provide WSUD related information?	Newsletters Press releases Media releases Web-based material	Brochures Letters Exhibitions Events	Leaflets Radio advertisements and interviews
Do you want to consult and identify key WSUD issues and concerns?	Letters Telephone hotline Events	Submission process Public meetings Open days	Surveys Workshops Web-based material
Do you need to consult and get input on WSUD initiatives?	Community events Submission process Web-based material	Response forms Surveys(postal or door-to-door)	Telephone hotline Seminars/forums
Do you need to deal with a complex WSUD issue?	Focus groups Road-shows	Surveys Representative forums	Regular meetings
Do you need to build relationships on WSUD?	Letters Open days	Meetings Advisory Committee	Community events Web-based material
Do you need to review a WSUD initiative or test a new approach?	Focus groups Meeting	On-ground learning Complaints system	Surveys Web-based material
Do you want inputs into WSUD decision-making?	Displays Surveys Events	Submissions Meetings Advisory Committee	Telephone hotlines Workshops Web-based material
Do you need regular dialogue with the same people?	Newsletters Radio advertisements	Leaflets Web-based material	Press releases

Key obstacles to stakeholder participation often centre around a stakeholders' knowledge, access to information, finances and time. Thoughtful design of the engagement process and support for stakeholders may remove some of these constraints to participation. Potential constraints can include:

- lack of knowledge of the engagement process, about council or WSUD;
- literacy and accessibility, such as, access to the Internet, email or telecommunications, and difficulties in getting to venues or concern about the engagement location;
- concerns about privacy; and
- lack of time, or concerns about travel costs and lost working time.

Engagement review

Stakeholder engagement aims for improved decision-making through better, more transparent communication and by considering the views of different stakeholders. It can be valuable to review an engagement to identify successes and challenges, and where future improvements can be made.

An engagement review can also ensure that any follow-up activities are undertaken to maintain strong relationships with stakeholders, and further promote trust and accountability. It is important to demonstrate that decision-making is enhanced by the engagement process and that stakeholder views have been considered. An evaluation can also demonstrate good engagement.

Appendix A8.2: WSUD implementation targets engagement checklist

Note: the actions identified in the checklist may need to be varied depending on council and WSUD implementation target engagement requirements.

WSUD engagement checklist: *[Project title]*	
Date:	**Version:**
Summary: *[Summary description]*	
Stakeholder engagement mapping and planning	
Map stakeholders and identify critical issues relating to WSUD implementation targets	
Assess and identify preferred method of engagement and specific engagement techniques to be used	
Develop engagement plan including: › identification of engagement goals and objectives › stakeholders and level of engagement › actions, resources, tasks and timelines for engagement, and › review procedures (including checking, review and approval)	
Consider strengthening engagement capabilities (internal and external)	
Engagement and communications material (as appropriate)	
Prepare engagement and communications material (including checking, review and approval for release)	
Produce engagement and communications material	
Identify stakeholder contacts and update databases	
Distribute communications material	
Monitor and review engagement and communications (as necessary)	
Engagement processes (as appropriate)	
Organise meeting venues (as required)	
Contact stakeholders and maintain dialogue	
Record and collect engagement feedback, and collate and analyse engagement feedback	
Prepare engagement feedback report and responses (including checking, review and approval for release)	
Distribute feedback report to stakeholders (if appropriate)	
Address feedback in development of WSUD initiative	
Engagement review	
Assess effectiveness of engagement process and document engagement successes, challenges, and areas for future improvement	

Appendix A9.1: Key WSUD evaluation questions and reporting approaches

Evaluation question	Possible method and data sources	Reporting approach
Appropriateness To what extent is the WSUD program or initiative aligned with priorities? To what extent is the WSUD program or initiative consistent with best practice processes?	Needs analysis techniques Expert review Participatory planning Impact assessment Periodic independent evaluation	Needs assessment Program and project reports on outputs and outcomes Financial reports
Impact In what ways and to what extent has the WSUD program or initiative contributed to changing environmental condition, management practices and institutions? What, if any, unanticipated positive or negative changes or other outcomes have resulted?	Monitoring condition of assets Periodic independent evaluation	Program and project reports on outputs and outcomes Annual report Periodic independent evaluation report
Effectiveness To what extent have the planned WSUD activities and outputs been achieved? Are current WSUD activities the best way to maximise impact or are there other strategies that might be more effective? To what extent is the WSUD program or initiative attaining, or expected to attain, its objectives efficiently and sustainably?	Research and large-scale data sources Program logic Periodic independent evaluation	Milestone reports Annual report Reports on program performance and outcomes Periodic independent evaluation report
Efficiency To what extent has the WSUD program or initiative attained the highest value out of available resources? How could resources be used more productively and efficiently? What could be done differently to improve implementation, and thereby maximise impact, at an acceptable and sustainable cost?	Auditing Periodic independent evaluation	Program and project reports on outputs and outcomes Financial reports Return on investment reports Periodic independent evaluation report
Legacy Will the WSUD program's impacts continue over time and after the program ceases? How and by whom should the legacy be managed?	Participatory planning and monitoring Periodic independent evaluation	Reports on program performance and outcomes Periodic independent program evaluation report.

Source: adapted from Australian Government 2009, *Natural Resource Management Monitoring, Evaluation, Reporting and Improvement Framework*, Canberra; and Australian Government 2009, *Developing and Using Program Logic in Natural Resource Management,* Canberra.

Appendix A9.2: A communications plan for WSUD implementation targets

Key questions to consider in preparing a Communications Plan for WSUD implementation targets are identified below. Further guidance and advice should be sought from a council communications unit (or similar).

1. **Objectives:**
   What is the main objective that the Communications Plan needs to support (the main change(s) you are trying to achieve) with WSUD implementation targets?

2. **Audience:**
   What are the three to five main audience groups that:
   - Can make a difference to the change happening (or not)?
   - Are affected by the change?

3. **State of opinions and knowledge.**
   What are stakeholders:
   - Attitudes regarding WSUD implementation targets (how do they feel?)
   - Opinions on WSUD implementation targets (what do they believe?)
   - Information gaps on WSUD implementation targets (what do they know?)
   - Do they have enough information on WSUD implementation targets to make the right decision? (Is it just that they don't believe the information they get?)
   - How do they influence others?

4. **Potential obstacles:**
   What are the potential obstacles to communication requirements for WSUD implementation targets, and how they might be overcome?

5. **Messages:**
   If you could change any of the opinions on WSUD implementation targets (or fill the information gap) which ones would you prioritise? (Is this achievable?) Therefore what messages or information needs to be continually highlighted to the main groups?

6. **Methods:**
   - What is the best method of getting to the audience group?
   - Who influences them?
   - What do they read?
   - Who do they speak to? Who do they believe?
   - What channels do we know don't work?

7. **Timing:**
   - How long will it take to change these opinions?
   - Are there logical opportunities on the calendar we can exploit?
   - When should we start?
   - When must we have achieved this attitude shift by?

8. **Plan:**
   Using this information, what are you going to do, for whom and how?

9. **Evaluation:**
   How will we know if we have changed their opinion on WSUD implementation targets?

Source: adapted from UK Cabinet Office 2004, *Strategy Survival Guide*, Version 2.1, London, pp. 83-84; and Department of Prime Minister and Cabinet and Australian National Audit Office 2004, *Implementation of Programme and Policy Initiatives Making Implementation Matter, Better Practice Guide*, Canberra, pp.47-48.

Notes

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